



## PARTICIPATION IN FLOOD RISK MANAGEMENT AND THE POTENTIAL OF CITIZEN OBSERVATORIES: A GOVERNANCE ANALYSIS

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**ABSTRACT:** The implementation of the European Flood Directive 2007/60/EC requires the establishment of public participation mechanisms to ensure citizens' involvement in the flood management cycle. This raises questions on how to achieve this goal and successfully translate the directive into meaningful and effective participation. Innovative means, such as citizen observatories enabled by information and communication technologies, have the potential to provide new ways of participation. In this paper, we undertake a comparative analysis of governance structures, institutions and mechanisms for citizen participation in the UK, the Netherlands and Italy and analyze the transposition of the directive in these different contexts. Empirical and desk research in the three case study areas was undertaken, covering local water authorities, environmental protection agencies, emergency services, local stakeholders, and their roles and interactions with citizens during different phases of the disaster cycle. Our analysis of the transposition of legal obligations for citizen participation shows that implementation is limited when examining in detail a) the respective roles and types of interactions between citizen and authorities and b) the impact of citizen participation on decision making. Different authorities have differing perceptions of citizen participation in flood risk management in terms of their roles and influence. Our results also indicate that these perceptions are related to the importance that the authorities place on the different stages of the disaster cycle (prevention, preparedness, response, and recovery). The local patterns of participation that have emerged from this governance analysis suggest that the citizen observatories can take specific 'shapes and sizes' in the three locations.

Key Words: Flood risk management, participation, innovation, decision making, citizen observatory

### 1. INTRODUCTION

Despite the progress of engineering works for flood disaster reduction over the last twenty years, flooding continues to be a major challenge (Yamada, 2010) and incidences of floods have been on the rise, responsible for more than half of all disaster-related fatalities and a third of the economic loss from all natural catastrophes (White, 2000 as cited by Bradford et al., 2012). Nowadays, flood risk management approaches focusing on non-structural measures, such as improved land-use planning, relocation, flood proofing, flood forecasting and warning and insurance are advocated (Bradford et al., 2012). One of the approaches being practiced by several European countries is integrated flood risk management which considers the full disaster cycle in the management and prevention of flood disasters (European Environment Agency, 2010). Moreover, the importance of stakeholder participation in decision making, and in flood risk management in particular, has been recognized: the Aarhus Convention (1999) aims for public participation in decision making on environmental issues and the European Flood Directive 2007/60/EC requires the establishment of public participation mechanisms to ensure citizens' involvement in the flood management cycle. Yet questions can be raised as to how to achieve this goal and successfully translate these requirements into meaningful and effective participation. Innovative means, such as citizen observatories enabled by information and communication technologies (ICTs) (e.g. sensor technologies and social media), have the potential to provide new ways (and perhaps even new paradigms) of participation, whilst at the same time generating relevant information and promoting demand-driven policy responses (Holden, 2006;

Rojas-Caldelas and Corona Zambrano, 2008). However, similar to other technologies, its realization will be socially shaped, including by local patterns of participation.

This paper undertakes a comparative analysis of governance structures, institutions and mechanisms for participation in the UK, the Netherlands and Italy. It analyzes the transposition of the European Flood Directive in these different contexts and examines the drivers for increased citizen participation in flood risk management, gauging the potential of citizen observatories to foster citizen participation in flood risk management. It draws on empirical and desk research in three case study areas in the UK, the Netherlands and Italy related to the WeSenseIt project. The remainder of this paper is structured as follows. Section 2 presents the conceptual framework which draws on the literature on participation. Section 3 details the methodological aspects. Section 4 presents the results of the three cases studies, followed by a discussion of the drivers and obstacles for participation in Section 5. Finally, Section 6 presents the conclusions.

## 2. THEORETICAL CONTEXT

Water governance as a concept has quickly gained popularity in policy dialogues since its emergence some two decade ago. Definitions of water governance abound but the very succinct definition by Lautze, de Silva et al. (2011) captures that "...*water governance is essentially the processes and institutions through which decisions are made related to water*" (Lautze et al., 2011:4). The term 'governance', in contrast to 'government', highlights a shift from state-centred management towards 'a greater reliance on horizontal, hybrid and associational forms of government', involving a broader network of actors, including citizens (Hill and Lynn, 2005:173; Swyngedouw, 2005). Water governance therefore consists of the processes of decision making and definition of goals by (a range of) actors, while water management (and flood risk management more specifically) consists of targeted activities to attain such goals. Analytical approaches for examining (water) governance processes, and participation, stem from a variety of disciplines but typically focus on institutional aspects and range from methodologically pragmatic (e.g. the OECD (2011) multi-level water governance analysis) to very comprehensive ones (e.g. Saravanan, 2008; Pahl-Wostl, 2009, 2010; and Rijke et al., 2012). The structural elements of water governance consist of four dimensions: 1. institutions, 2. actor networks, 3. multi-level interactions, 4. governance modes (Pahl-Wostl, 2009).

Parallel with the rise of horizontal 'modes of governance', relying on networks of actors and individuals, is the increased emphasis on stakeholder participation. Based on a literature review of stakeholder (rather than broader public) participation in decision making, Reed (2008) argues that participation approaches have progressed through a series of phases: awareness raising in the 1960s, incorporation of local perspectives in the 1970s, recognition of local knowledge in the 1980s, participation as a norm as part of the sustainable development agenda of the 1990s, subsequent critiques and recently a 'post-participation' consensus regarding best practice. Although participatory approaches are commonly presented as antidotes for a lack of legitimacy of traditional policymaking approaches and as a means for leading to more informed and effective policies, several studies have also shown that many participatory approaches fail to do so (Edelenbos and Klijn, 2006; Behagel and Turnhout, 2011). Arnstein's (1969) seminal article 'The ladder of citizen participation' serves as a starting point for most debates on citizen participation. She ranked different levels of participation along an eight point scale, or 'ladder', ranging from manipulation (the lowest in the group of non-participation steps) to citizen control (the highest step; also the highest degree of citizen power). The usefulness of this distinction is debatable and has been criticised for implying that participation is an ends rather than a means. Specifically, Fung (2006) argues that the ladder mixes empirical scaling with normative approval while excluding important elements of the context and, therefore, the desirability within which participation may take place. It also does not take into account links between i) the goals of involvement, ii) those who actually participate and iii) the ways in which they are invited to participate (Tritter and McCallum, 2006). Fung (2006) proposed an alternative, distinguishing between three dimensions of public decision mechanisms, namely i) the scope of participation (who participates: from government representatives to the general public (citizens), ii) the mode of communication and decision (how participants interact and what role they play), and iii) the extent of authority (participation for personal benefit only (individual education), up to direct authority). While also driven by the main concern of enhancing citizen participation in governance, he argues that the resulting three-dimensional 'democracy cube' provides a basis for understanding the potential and limits of participation. Different participatory mechanisms can be situated in the cube and compared in order to understand their suitability for addressing specific governance problems.

Modes of participation are also being influenced by technological developments, for example, the use of geographic information systems for public participation (e.g. White et al., 2010). The innovative combination of existing and new sensor technologies and other ICTs has given rise to so-called citizen observatories, in which the observations of ordinary citizens, and not just those of scientists and professionals, can form an integral part of (earth) observation and decision making. Citizen observatories can vary, for example, in terms of their area of application (observing the physical environment or human behaviour), collecting objective or subjective measurements, from bottom up to top down implementation, and using uni- or bi-directional communication paradigms between citizens and data ‘processors’ (Ciravegna, 2013) (see Table 1).

Table 1: Dimensions of citizen observatories

Dimensions	Range	
Sensors & transmission	Physical sensor	Social sensor
Stakeholders	Authorities	Citizens
Area of application	Physical environment	Human behaviour
Purpose of citizen observatory	Protect environment	Strengthen governance
Integration	Stand-alone	Integrated
Measurement	Objective	Subjective
Implementation	Bottom up	Top-down
Communications paradigm	Uni-directional	Bi-directional
Citizen participation in governance processes	Implicit data provision	Technical expertise
	Individual education	Direct authority

Source: Based on Ciravegna et al. (2013)

The key aspect of the citizen observatories of water envisaged by the WeSenseIt project is the direct involvement of user communities in the data collection process: it enables citizen involvement by collecting data via an innovative combination of easy-to-use sensors and monitoring technologies as well as harnessing citizens’ collective intelligence, i.e. the information, experience and knowledge embodied within individuals and communities communicated via social media (e.g. Twitter, Facebook, etc.) and dedicated mobile applications. In this scenario, citizen involvement can span from data collection and provision (e.g. monitoring water levels using a range of sensors), feedback and knowledge exchanges (via mobile apps or online platforms) to actual involvement in decision making (online or face-to-face) in order to harness environmental data and knowledge to effectively and efficiently manage flood risk. In the first phase of implementation, these citizen observatories of water are focusing on citizens’ contribution to, and their participation in, flood risk management. Despite their acclaimed potential, citizen observatories are a recent phenomenon and therefore little is known about the potential for citizen participation that they offer.

For our purpose of gauging the potential of citizen observatories for participation in flood risk management, we built on and adjusted the democracy cube by Fung (2006) so as to have a means to analyse the distinct participation mechanisms in the three WeSenseIt case studies according to a common classification scheme (see Figure 1). Specifically, the ‘communication and decision scale’ is completed in line with the WeSenseIt-enabled social sensor possibilities so that the scale adequately captures the means of interaction and the roles that participants can play in decision making. A ‘social sensor’ role refers to citizen observations collected and mined from social media without citizens necessarily realising that their observation about a local situation is being included in a decision making process. Secondly, the category ‘human sensor’ is included to capture the intended and volunteered observations by citizens, collected using photos or sensor technology. Secondly, Fung’s (2006) ‘scope of participation’ dimension is adjusted to the specific stakeholders that may be involved in flood risk management and governance (ranging from citizens, citizen scientists, volunteers and trained volunteers, to various types of public sector institutions).

In our study, we distinguish between the different stages of flood risk management in which citizens are participating in decision making. Disasters such as floods are not considered exceptional events in the sense that there seems to be a tendency for such events to recur and to be localised (Alexander, 2002). Emergency planning therefore intends to plan and prepare for such events in order to reduce the risks to human life and physical damages. The repetitive nature of disasters has resulted in distinct responses and these have been captured by the so-called disaster cycle. Specifically, we refer to the

four stages preparation, response, recovery and mitigation (mostly referred to as prevention in the European context).

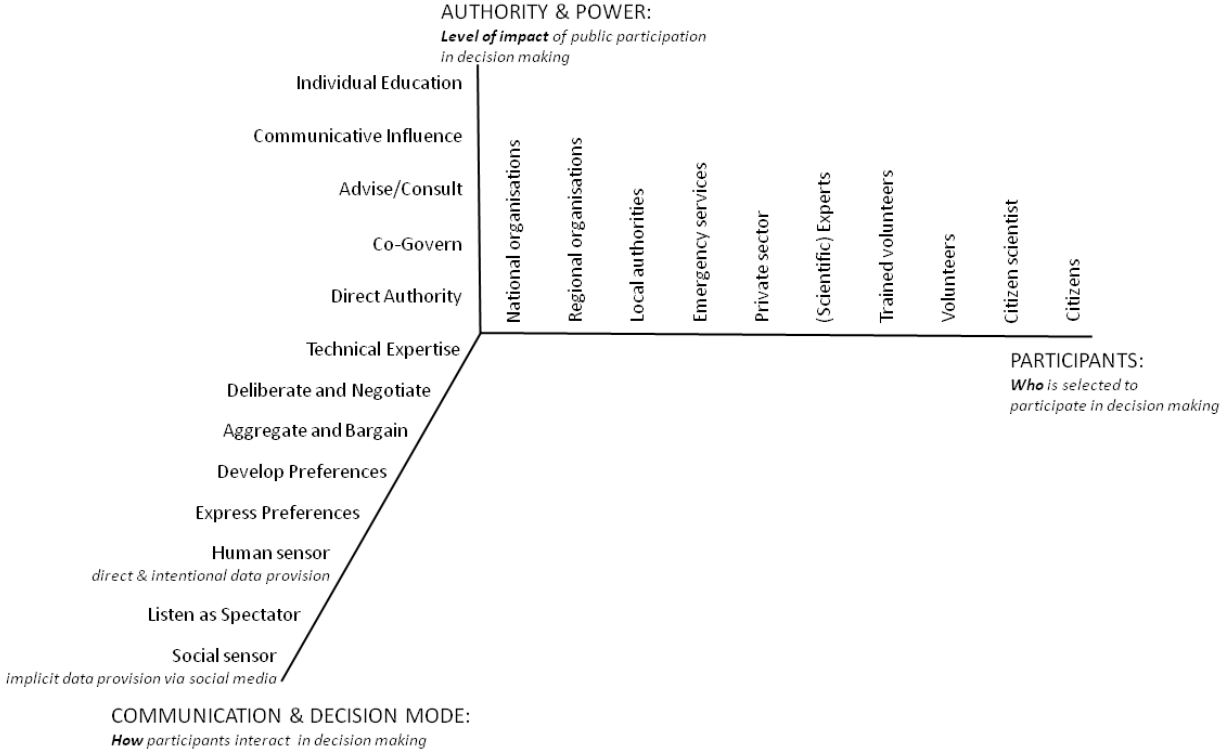


Figure 1: Adjusted Democracy Cube; Source: Based on Fung (2006)

**3. METHODOLOGY**

The conceptual framework was operationalised by translating the concepts into questions for desk research and for a detailed protocol for semi-structured interviews. A range of information and data sources were consulted such as national legislation and country reports about the implementation of relevant EU Directives (incl. the Water Framework Directive, Flood Directive) and the Aarhus Convention. Empirical research was carried out between May and November 2013 in the three case study locations of the WeSenseIt project (Doncaster in the UK, Delfland in the Netherlands, and Vicenza in Italy). Interviews were sought with relevant local authorities, emergency services as well as regional (and, possibly, national) policy makers (see Table 2). A broad assessment of perceptions of a wide range of potential or actual stakeholders from civil society or the private sector was beyond the scope of this research. In total, 16 face-to-face interviews were conducted. In addition to the interviews following the protocol, the Italian case study selectively draws on empirical material that was produced in the context of defining the technical requirements for the WeSenseIt platform (nine interviews, in brackets in Table 2). For all three cases, transcribed interviews were analysed according to the framework introduced in section 2 and the collected data triangulated with the information from desk research.

Table 2: Overview of interviews per case study

	<i>Doncaster (UK)</i>	<i>Delfland (NL)</i>	<i>Vicenza (Italy)</i>
<b>Local authority</b>			
Emergency/crisis	<ul style="list-style-type: none"> <li>Doncaster Metropolitan Borough Council (DBMC) Resilience and Emergency Planning Manager</li> </ul>	<ul style="list-style-type: none"> <li>Westland: Policy advisor Public spaces and security</li> </ul>	<ul style="list-style-type: none"> <li>AIM Vicenza Valore Citta: Director</li> <li>Water utility (Acque Vicentine): Director and President</li> <li>(Fire services Vicenza: Captain and Fire Officers)</li> </ul>
Planning	<ul style="list-style-type: none"> <li>DBMC Environmental planning manager</li> </ul>	<ul style="list-style-type: none"> <li>Westland: Policy advisor Spatial Development and water</li> </ul>	<ul style="list-style-type: none"> <li>(Vicenza City Council, Planning Counsellor)</li> </ul>
Infra-structure	<ul style="list-style-type: none"> <li>DBMC: Drainage engineer, Flood Risk and Engineering</li> <li>Drainage Board: Senior</li> </ul>		<ul style="list-style-type: none"> <li>(Vicenza City Council: Traffic Management Counsellor)</li> </ul>

	<i>Doncaster (UK)</i>	<i>Delfland (NL)</i>	<i>Vicenza (Italy)</i>
<b>Local authority</b>			
	Drainage Engineer		
Policy making	<ul style="list-style-type: none"> <li>Elected councillor</li> </ul>		<ul style="list-style-type: none"> <li>(Vicenza City Council: Mayor and Deputy)</li> </ul>
	<ul style="list-style-type: none"> <li>Regional authority</li> </ul>		
Emergency	<ul style="list-style-type: none"> <li>South Yorkshire (SY) Fire &amp; Rescue: station manager</li> <li>SY Police: Contingency planning officer</li> </ul>	<ul style="list-style-type: none"> <li>Water Authority (WA) Delfland: Policy advisor Crises control and management</li> <li>WA Delfland: Team leader Crises and communication</li> </ul>	<ul style="list-style-type: none"> <li>(Civil Protection Veneto: President)</li> </ul>
Planning		<ul style="list-style-type: none"> <li>WA Delfland: Team leader spatial development</li> </ul>	<ul style="list-style-type: none"> <li>(Veneto environmental prevention and protection agency (ARPAV): Director and Advisors)</li> <li>(Public Works: Planning officer)</li> </ul>
Infra-structure		<ul style="list-style-type: none"> <li>WA Delfland: Team leader maintenance water infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>(Land Protection: Director and Infrastructure Officer)</li> </ul>
<b>National authority</b>	<ul style="list-style-type: none"> <li>Environment Agency (EA): Senior Advisor</li> </ul>		<ul style="list-style-type: none"> <li>(National Civil Protection: Advisor)</li> </ul>

## 4. CASE STUDIES

### 4.1 UK Case Study (Doncaster)

The city of Doncaster is located in the county of South Yorkshire in England, along the river Don. This town has suffered from significant flooding events over many years, including the large-scale floods in 2007 that affected much of the United Kingdom. Both, the topography of the county of South Yorkshire and its network of river catchments contribute to the flood risk of this region. It is liable to fluvial (river), pluvial (rain induced) and marine (sea) flooding caused by heavy rainfall in the catchment of the river Don and tidal fluctuations and potential floods from dam failure in the valleys to the North and West of the county (which contain 17 major reservoir dams). Doncaster Metropolitan Borough has some 320,000 inhabitants; some 25,000 properties are currently at risk from river Don flooding.

#### 4.1.1 Citizen participation in flood risk management in Doncaster

Generally, in this case, citizen participation consists of a variety of citizen groups (volunteers, elected citizens, citizen scientists and communities) and rests on a range of communication modes (from listening as a spectator to expressing and developing preferences on specific issues). The flood wardens are active in specific, flood-affected areas (neighbourhoods) of Doncaster and involved in the higher level Council and in regional committees. They support the work of both, the EA and DMBC, by reporting and informing on flood-related issues (e.g. obstructions/overgrowing of waterways, etc.) on the basis of regular inspections of the local area. They also function as intermediaries between the Council and the communities for awareness-raising about flood-related issues.

The range of formal institutions pertaining to flood risk management in Doncaster is broad, even after the recent consolidation of legislation at the national level. These institutions have implications for which and how different actors involved in flood risk management in Doncaster<sup>1</sup> collaborate and make decisions related to the different phases of flood risk management. During the preparation, impact and response phases, a strong command and control structure is in place to deal with emergency situations and to draw on necessary resources, if necessary from national government. The drainage board described the citizens as the Council's 'eyes and ears on the ground', providing essential information about the local situation in their role as human sensors. Nevertheless, the authority and degree of impact of citizen participation in this phase is limited to decisions concerning personal safety and the protection of their property. While DMBC and emergency services such as the police can strongly advise citizens to evacuate and leave their property, the ultimate decision rests with the citizens themselves.

During the recovery and mitigation phases, the main drivers for citizen participation consist of a) formal

<sup>1</sup> i.e. Doncaster Metropolitan Borough Council (DMBC or the Council), the emergency services such as South Yorkshire (SY) police and Fire & Rescue, the Environment Agency (EA) and the public.

institutions such as the Civil Contingencies Act (2004) and the Local Government Act (2000) which is concerned with the socio-economic well-being of local areas as well as having to tie in with national strategies for flood risk and resilience (e.g. the Floods and Water Management Act 2010<sup>2</sup>), b) a drive by the (local) authorities to change the mind set of citizens (from being a customer 'receiving services' to taking responsibility, including for flood risk management) and c) changes in the funding structure that now require various stakeholders to collaborate (EA, local authorities, communities) and present a shift in citizen participation to the start - rather than the end - of the planning process. For both the DMBC and the EA, the sequence of the project cycle of flood risk schemes (e.g. infrastructure investments) has changed from 'design – defend – implement' to 'discuss – design – implement'. This presents a shift of the interactions with citizens to the start of the planning process, avoiding confrontation with communities just before project implementation. Moreover, the DMBC planning unit is obliged to demonstrate 'fit for purpose participation' in their planning activities. DMBC is also proactively approaching the communities via the Parish councils and flood wardens (volunteer representatives from the local communities, initiated by the Council following the 2007 floods) to identify their biggest worries or perceived risks. Furthermore, they also talk to 'angry' groups who are thus both empowered and included in the process. During the recovery phase of a flood, public meetings and drop in days are organised at the Council. These meetings present an opportunity to express and develop the citizens' preferences.

During the recovery and mitigation phases, the role and level of impact in decision making by citizens more generally also extends beyond personal education to 'influential communication' as well as 'advising and consulting', e.g. during the range of community meetings in which South Yorkshire Police, the EA and DMBC seek the communities views and feedback on proposed measures as well as identifying problems and needs in the local areas. These public meetings are (by now) a prominent two-way communication mechanism for awareness-raising as well as gathering information and feedback from flood-affected or at-risk communities about flood risk management and necessary actions, with the overall goal of building trust in the agencies' approach to flood risk management. It is important to note that it took a while to establish these meetings with a critical mass of citizens attending.

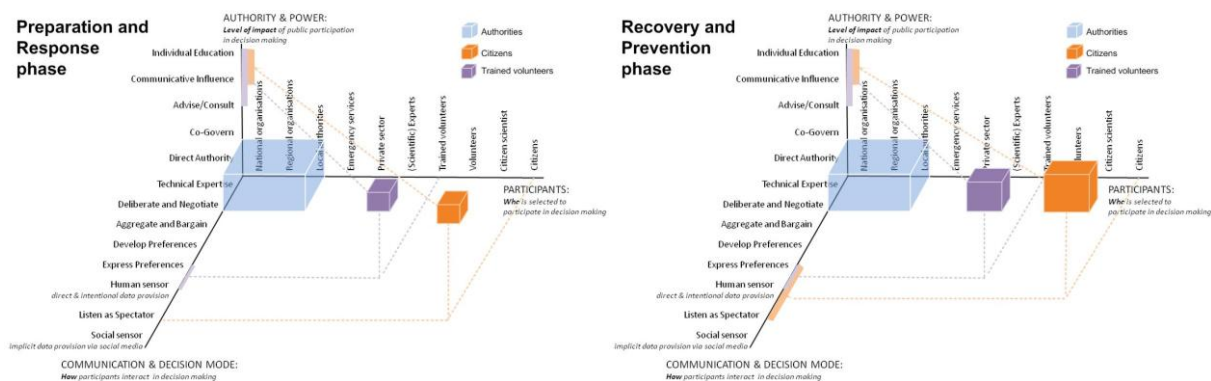


Figure 2: Doncaster – Citizen participation during the distinct flood risk management phases

The authorities and emergency services all seem to consider the communities and citizens valuable providers of information and insights. Community representatives such as flood wardens (trained volunteers) and citizens elected as councillors are involved in, and attend, regional committees (e.g. the DMBC Multi-Agency Flood Forum) and as such have the means to have an impact in decision making by influencing agenda setting. Moreover, elected councillors have the authority to approve policy documents related to flood risk management (e.g. the Preliminary Flood Risk Assessment in 2011 (DBMC, 2011)). In comparison, during the immediate preparation, impact and response phases, the overall position and influence of citizens in decision making is more limited (see Figure 2). The communication modes are more limited, with citizens listening as spectators and acting as human sensors by reporting on the local situation. The level of impact of public participation in decision making during this phase is also more limited and more concerned with individuals and communities

<sup>2</sup> The Flood and Water Management Act was implemented following the comprehensive review of the UK flooding in 2007 in the so-called Pitt report (Pitt, 2007) which recommended strengthening the role of local authorities in leading the co-ordination of flood risk management in their vicinities.

being informed about the current situation rather than having a say in how the situation should be dealt with.

## **4.2 Dutch Case Study (Delfland)**

The water authority Delfland is located in the province of South Holland and is bordered by the North Sea and the Nieuwe Waterweg (New Waterway - main deep water access canal to the Port of Rotterdam). Its administrative area covers amongst others the municipalities of The Hague, and large parts of Rotterdam. The area has a size of 41,000 hectares on which 1.4 million people live and work. It is one of the most densely populated and industrialized areas of the Netherlands. The water authority is tasked with water quantity and quality issues; maintaining safe dikes and dunes (both sea and river based flood control), and operation of several wastewater treatment plants. The Westland municipality is characterized by intensive greenhouse horticulture and is located in the South-Western tip of Delfland. During peak rainfall, some neighbourhoods and greenhouse areas experience problems and economic damages from flooding. Major flooding in the Westland area in 1998 caused an estimated damage of about €50 million (NBDC, 1998).

### **4.2.1 Citizen participation in flood risk management in Delfland**

The Netherlands has a highly institutionalized flood risk management system. Decisions about spatial planning and flood risk management related issues are made by the water board and the municipal council (both are elected bodies). In projects for flood risk management citizens are often informed and heard observers via public meetings, sometimes in workshop settings. Flood risk management is mostly addressed as a technical issue, to be dealt with by (public) professionals rather than citizens and is focused on prevention (rather than citizen's ability to cope with flooding). At the same time, citizens expect that flood safety is guaranteed by the authorities. According to the perception of the interviewed authorities', floods can come to many citizens as a surprise, because of the relatively low level of awareness of flood risks. The OECD (2014) presented this "awareness gap" as one of the main challenges for future Dutch water governance. This low level of awareness is the result of both, i) the stance and the ability of the authorities to preventing floods rather well, and ii) the citizens not feeling responsible for flood preparedness themselves. There is very limited citizen participation in the preparation and response phases in Delfland. The trained volunteers for dyke inspection (the dijkleger; EN: dike army) have a more influential role. Enserink et al. (2003) observed that there is no tradition of public participation in water management in the Netherlands.

The primary role of citizens in decision-making is indirect via elections of the water board. However, voter turnouts are low, at 20% in 2008. In the densely built-up Delfland area, several projects focus on giving space to water to prevent flooding in other areas. Stakeholders are more and more involved in these planning and decision making processes, although final decisions are exclusively made by the water board and municipal council. Communication is traditionally unilateral, but via workshops and consultation sessions, stakeholders and citizens are involved for information, advice, or consultation. The level of engagement is, however, not institutionalized (like knowledge sharing, consulting, advising, co-development). It depends on the project context, the project leader and team (and their available time and resources). In the case of spatial/flood risk management projects, citizens are engaged in knowledge provision and consultation. Individual stakeholders are able to block or slow down the implementation of flood risk projects by not cooperating (e.g. by not selling property as required by a particular infrastructural project). As such, their influence is greater than during the planning and decision making phases about flood risk schemes (see also illustration in Figure 3).

The communication department of Delfland is tasked with communicating information to the public and with interpreting and translating specific technical information for non-experts. In Delfland's view, stakeholder participation is only trusted when it is transparent and only works when people are informed in order to play a role in participatory processes (necessitating 'translation' of technical information). In particular, because of the citizens 'awareness gap' on the current risk of flooding, they will also be unable to interpret the severity of an increased flood risk. The interviewed authorities stressed the need for gaining a better insight in citizens' flood risk perceptions in different regions of their administrative area.

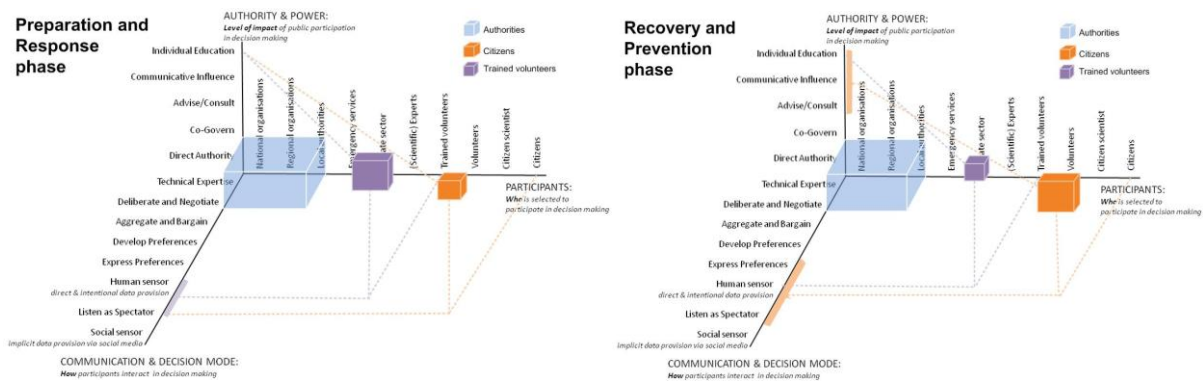


Figure 3: Delfland – Citizen participation during the distinct flood risk management phases

During emergencies, citizens do not have a formal role in decision making. The designated mayor coordinates all actions as crisis manager. The water authority is providing technical expertise, and coordinates the dijkleger and contractors in dyke re-enforcement emergency activities. Specific disaster information communication happens via local radio and television broadcasting. Registered cell-phones can be reached via the 'NL alert' service within the specific geographic area to communicate information ([www.NLalert.nl](http://www.NLalert.nl)). During disasters, communication is currently characterized by its uni-directional flow (also in the authorities' use of social media). Several interviewees suggested that there is much room for improving communication of the authorities to citizens during emergencies. Currently, citizens are, in the first instance, regarded as possible victims and not as active disaster managers. However, during a crisis, citizens are the first on the spot to actively provide help in any way they can, whether the authorities approve of it or not. In conclusion, although different citizens have differing roles in communication and interaction with the authorities, it can be concluded that, in Delfland, citizens in general are spectators in the interaction with the authorities on flood risk management.

### 4.3 Italian Case Study (Vicenza)

Vicenza is located in the Veneto Region in the Northern Italy and is surrounded by the Beric hills in the South and the Prealpi in the North-West. The Metropolitan area of Vicenza includes both an urban centre, which has exponentially grown in the past century, and peri-urban farmland, for a total population of 113,644. A major flood hit 130 municipalities in the Veneto region in 2010, with one of the most affected municipalities being Vicenza, where 20% of the metropolitan area was flooded.<sup>3</sup> The damages in the Province of Vicenza were estimated to amount €6.5 million, arising from more than 11,000 affected inhabitants, 1,600 damaged private buildings, 50 km of flooded streets, some 400 businesses and 9 public services.

#### 4.3.1 Citizen participation in flood risk management in Vicenza

Italy has a centenary history of hydraulic management legislation. The first integral flood risk management law, however, was emanated in 1989 (183/89 law<sup>4</sup>). The law placed little emphasis on public participation, which became more prominent in subsequent legislation, emanated to comply with the EU Water Framework Directive 2000/60/CE and the Water Framework Directive 2007/60/CE. With the decree 152/2006, the Hydrological District Authorities (Autorità di Distretto Idrografico) were made responsible of organizing and implementing public participation and ensuring transparency, dissemination and accessibility of data to allow all stakeholders to provide comments and observations (art. 66, comma 7). Information and alert system were then delegated to Regions and Civil Protection, a national organization decentralized on the territory, whose mandate is to protect human life, goods, settlements and environment from natural disasters. Regions and Civil Protection was also given the responsibility to promote stakeholder participation in designing and refining the basin plans (Decree n. 49/2010, art. 11).

<sup>3</sup> See Bacchiglione River at <http://www.bacchiglione.it/alluvione.php>, accessed on July 2013 and Comune Di Vicenza, Settore Infrastrutture, Gestione Urbana e Protezione Civile at <http://www.comune.vicenza.it/uffici/dipterr/infrastruttureeverdepubblico/emergenzaalluvione.php>, accessed July 2013.

<sup>4</sup> Norme per il riassetto organizzativo e funzionale della difesa del suolo (183/89), integrated with law 253/90 and 493/93.



While key local government organizations seem to agree on the potential of citizen participation in flood risk management, in practice the role attributed to citizens is quite marginal and instrumental to assisting (e.g. providing information) and supporting local government bodies involved in flood risk management (e.g. implementing and complying with legislation). Citizens are mainly regarded (but not always ‘used’) as potentially holding two roles: providers and recipients of information. As a source of information, their role is mainly envisioned during the prevention phase or day-to-day management, when citizens are encouraged to collect and disseminate data. Local authorities, however, tend to prioritise a selected group of citizens that are viewed as more competent and knowledgeable. These include individuals and organizations members of the Protezione Civile that have been trained by the latter on flood management (i.e. trained volunteers) and citizens with specific expertise/professional competencies (i.e. citizen scientists). As a recipient of information, citizens seem to act as ‘spectators’ who are provided with emergency procedures (e.g. citywide alarm system, mobility plan, ‘green phone’ emergency number). At the same time, citizens are not perceived as manifesting a strong willingness to participate in flood management. This lack of commitment was labelled a ‘cultural problem’ during the interviews. However, this attitude also reflects the sporadic nature and the spatially uneven impact of flood events. For instance, most of the damages occur in areas along the river, while large parts of the city centre are only marginally affected. The commitment to participate seems to be directly correlated with the degree of impacts that citizens suffer from the flood events, thus leading to a varied participation based on geographic and situational factors.

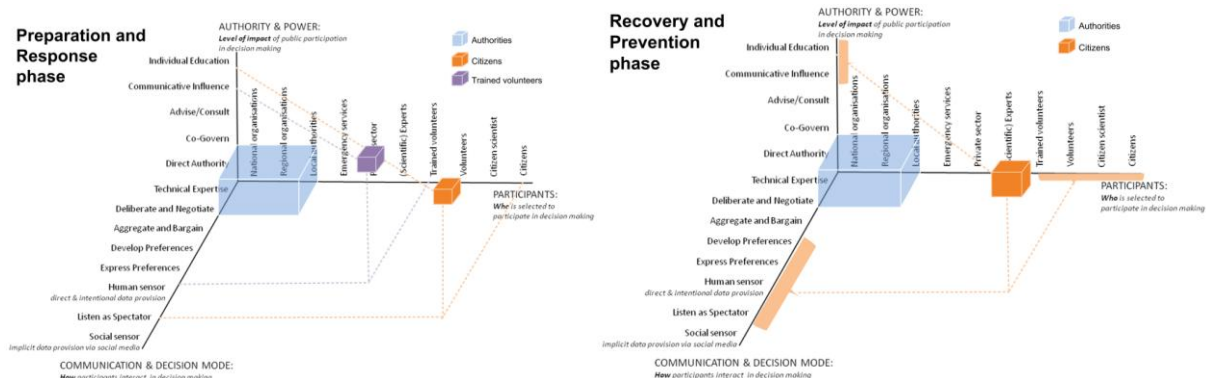


Figure 4: Vicenza – Citizen participation during the distinct flood risk management phases

In this set up, citizens’ participation in flood risk management is relatively limited. First of all, the strategy adopted in Vicenza and its surroundings mainly focus on mitigation measures, dealing with emergencies, optimizing resources and providing effective and rapid support where needed. In this phase, however, there is little room for citizen involvement. Additionally, participation as envisioned by local authorities is mainly focused on information exchange (to and from the citizens), while involvement in decision-making processes seems latent. Thirdly, citizen participation is selectively implemented: the most prominent strategy of citizen participation in flood risk management seems to be more geared towards the establishment of a network of qualified observers, rather than towards a broader involvement of citizens’ groups. The involvement of expert citizens and trained volunteers takes place mainly via the volunteer component of ‘Protezione Civile’. The ‘common’ citizens are seen as a recipient of information, a spectator who has to execute tasks and practices designed by local authorities, rather than an active participant (see illustration in Figure 4).

## 5. DISCUSSION – DRIVERS AND BARRIERS FOR CITIZEN PARTICIPATION

Our analysis of the three case studies has identified local patterns of citizen participation in flood risk management. Two distinct factors can be identified that seem to function as drivers or barriers, respectively strengthening or hindering citizen participation. The first consists of the authorities’ perception of citizen participation and the extent to which authorities expect or have experienced valuable outcomes from citizen participation during the different flood risk phases. In the Doncaster case, the benefits of participation are perceived to consist of much improved insights into the needs of at-risk communities by the local authorities and the emergencies services, gained during regular face-to-face meetings with communities and in a changed sequence of steps during flood risk interventions, from ‘design – defend – implement’ to ‘discuss – design – implement’. This goes hand in hand with a

changing role for citizens envisaged by the authorities, from a 'customer'-like role to a more active engagement in flood risk management and other areas of public policy. These findings are consistent with Nye et al. (2011) regarding the emphasis on community engagement and responsibility for flood risk planning in the UK. In the Dutch case, less emphasis is placed on citizens' local needs and knowledge, with a more passive role for citizens who will simply be informed and consulted about plans and decisions in flood prevention projects, much like the 'design-defend-implement' approach. Similarly, in the Italian case, only 'selective' citizen participation takes place or is foreseen (e.g. by citizen scientists) and most citizens are considered 'obedient' implementers of established practices.

Secondly, the citizens' interest in participating in flood risk management is seen by the authorities to stem from their perception of flood risk: the lower the citizens perceive flood risks, the more limited their interest in participation. Yet the authorities responses to low levels of flood risk perception are different: in the UK case, considerable efforts are being made by the local authorities (with limited response and success) to reach broader segments of the population than flood wardens (typically pensioners) and school children. In the Dutch case, the perceived 'awareness gap' among citizens and a resulting lack of trust in community resilience during the impact phase go hand in hand with a paternalistic governance style of the authorities, focusing on prevention of floods altogether rather than preparation, jointly with citizens. Similarly, in the Italian case, the authorities perceive low flood risk awareness of citizens stemming from, and justifying, a focus on infrastructural measures. In the latter two cases, low flood risk awareness seems to act as a barrier for participation.

## 6. CONCLUSIONS – FROM DE JURE TO DE FACTO PARTICIPATION

On paper (*de jure*), formal institutions, such as the Flood Risk Directive, the EU Water Framework Directive and the Aarhus Convention require citizen participation (in flood risk management), but, *de facto*, the importance given to these and the extent of their implementation varies in the three cases we examined in this paper. Our analysis of their transposition has shown that implementation is limited when examining in detail a) the respective roles and types of interactions between citizen and authorities and b) the impact of citizen participation on decision making. Within-case differences stem from differentiations among citizen such as volunteer groups and elected citizens. The variety in public participation approaches in these cases may also be due to the lack of a clear framework for, and conceptualization of, public or stakeholder participation in the EU white paper on governance (2001) and the EU directives (Magnetite, 2003).

Different authorities perceive divergent roles for citizen participation in flood risk management, that are based on social, cultural and historical backgrounds but our results also indicate that these perceptions are related to the emphasis that the authorities place on the different stages of the disaster cycle: a strong focus on prevention/mitigation in the Dutch case, while in the UK and the Italian cases, more emphasis is being placed on preparedness and response. We contend that, in relative terms, current participation approaches in the three cases present citizens with somewhat stronger impact on decision making and a slightly broader spectrum of possible interactions during the recovery and mitigation phases than during the preparation, impact and response phases. Yet it is during recovery and mitigation that the authorities experience citizen awareness of flood risks at its lowest level.

As we argued at the outset, ICTs in general, and their innovative combination for citizen observatories in particular, can present new opportunities for citizen participation. As indicated above and analysed in more detail elsewhere (Wehn and Evers, 2014), these cases do not yet present strong ICT-enabled participation (eParticipation). Nevertheless, the local patterns of participation that have emerged from this governance analysis suggest that the citizen observatories are likely to take specific 'shapes and sizes' in the three locations. Different perceptions of the role of citizens, combined with the different strategies adopted by the three countries in response to the EU directives seem to call for different set ups of citizen observatories. For the authorities, it seems important to clearly define the role of citizens for the different stages of the decision making process and for the different stages of the disaster cycle, as well as to provide feedback on how the provided data, information and insights collected via the citizen observatories were used in the decision making processes. In situations of lacking institutionalised public participation, as in the Dutch case where participation is done *ad hoc* (depending on the project context), a citizen observatory may present an opportunity for local authorities and citizens to develop more regular and fitting means of citizen participation. In other contexts, such as the UK case with its reliance on regular and intense face-to-face contact with

(mostly older and less technology-savvy) members of the communities, a citizen observatory may help to bridge the (largely generational) participation gap by involving previously unengaged segments of the communities such as the Digital Natives and their parents. In any event, care needs to be taken that citizen observatories indeed help to create inclusive - rather than exclusive - participatory processes.

Our governance analysis has focused on the perceptions of the involved authorities and has shown that the observed (limited) levels of citizen participation in these cases do not necessarily imply that greater involvement in decision making is not being sought or even being prevented by policy makers and local authorities. Rather, not all citizens may be in a position to, or interested in, participating in flood risk management. Indeed, in several Dutch water management projects, citizens were under the impression that decisions were made before consulting the public and that their input was not taken seriously (Evers, 2011). Future research should therefore systematically investigate the motivations of and (dis)incentives for citizens to participate in flood risk management in order to confirm the authorities' claims in terms of 'awareness gaps', 'flood risk fatigue' during the prevention phase and 'customer service' attitudes of citizens and to indicate how citizen observatories may help to address these in the interest of participation for improved flood risk management.

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