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Understanding Inter-Municipal Conflict and Cooperation on Flood Risk Policies for the Metropolitan City of Milan

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ABSTRACT: Due to hydrological dependencies within catchment areas, the development and implementation of urban flood risk policies require cooperation between upstream and downstream municipalities. Such cooperation may be difficult to realise in practice due to the diverging interests of these municipalities, which might result in upstream-downstream conflicts. In this paper, we aim to gain a better understanding of inter-municipal conflict and cooperation on flood risk policies for the Seveso River Basin in the Metropolitan City of Milan. The Transboundary Waters Interaction NexuS (TWINS) model is used to describe the evolution of conflict and cooperation, and the shift towards the securitisation of flood risk management in the basin. The politicised Institutional Analysis and Development (IAD) framework is used to gain a better understanding of decision-making on Seveso flood risk policies. It is concluded that the ever-increasing frequency, and damage caused by flood events, together with an institutional setting which is characterised by power asymmetry between the Metropolitan City of Milan and upstream municipalities, and a dominant engineering resilience discourse have resulted in the securitisation of the Seveso's issues. The securitisation is characterised by a closed decision-making process, which may explain the resistance by actors not involved in decision-making and thus, the emergence of new conflicts.

KEYWORDS: Flood risk management, urban flood resilience, upstream-downstream relationships, nature-based solutions, institutional analysis, Transboundary Waters Interaction NexuS (TWINS), Milan, Italy

INTRODUCTION

Flooding is the most widespread natural disaster in Europe and accounts for the most casualties and greatest economic damage (WWF, 2004; CRED, 2009). Increases in economic damage due to flooding are primarily determined by socio-economic development (Barredo, 2009; Seher and Löschner, 2018). Since the 1970s, Europe has experienced population growth, improved life quality standards and increased real per capita wealth (EEA, 2010), resulting in significant impacts on floodplains (e.g. urbanisation, deforestation, and river straightening). The industrialised world has historically relied on hard flood control infrastructure to reduce flood risks.

Recently, new management approaches have been developed with a gradual shift towards an integrated approach to flood risk management. The so-called risk-based approach emphasises the importance of integrating structural and non-structural measures of flood risk management (i.e. river restoration, green infrastructure) (WWF, 2004; Schindler et al., 2014, 2016). The risk-based approach promotes a catchment-based perspective in flood risk management, as embraced in the Integrated Water Resource Management (IWRM) paradigm. It also requires the implementation of strategies at multiple spatial scales, both to reduce flood probability and to limit the consequences of flood events (Zevenbergen et al., 2008; van den Hurk et al., 2014).

Limited research has been carried out on the cooperation between upstream and downstream municipalities regarding the development and implementation of flood risk policies (Pigeon, 2012; Lee and Moss, 2014; Seher and Löschner, 2018). Both Lee and Moss (2014) and Seher and Löschner (2018) point to the importance of taking into account hydrological relationships within a catchment, and the need for coordination of policies between upstream and downstream actors. As an example, the construction of a retention basin within a municipality situated in the upstream part of a river basin may enhance flood resilience in a downstream municipality. Such cooperation may however be difficult to realise in practice due to upstream-downstream conflicts resulting from the divergent interests of upstream and downstream municipalities.

In this article we discuss the development of flood risk policies for the Seveso River Basin as an exemplary case of upstream-downstream conflicts. The Seveso River is partly situated in the Metropolitan City of Milan, and intensive land use has had a significant impact on both the river regime and water quality (Borrini and De Polo, 1985; AIPO, 2013). As a consequence, the downstream City of Milan is hit by floods on an annual basis (Regione Lombardia, 2018a). The design of a set of water storage reservoirs[1] – part of *Progetto Seveso Acque pulite, acque sicure* (here: the Seveso Project) – is the latest strategy by the Lombardy Region to reduce the hydraulic risk and enhance the water quality in the river (Italia Sicura, 2014). In spite of the urgency of the flood risk and the availability of dedicated financial resources, the Seveso Project has not yet been implemented due to conflicts between Milan and upstream municipalities.

The main research question addressed in this paper is: How can we understand the evolution of inter-municipal conflict and cooperation regarding flood risk policies for the Metropolitan City of Milan between 2004 and 2019? To answer this question, we combine the Transboundary Water Interaction Nexus (TWINS) model and the politicised Institutional Analysis and Development (IAD) framework. The TWINS model has been used to analyse conflict and cooperation between riparian states sharing international rivers (Mirumachi and Allan, 2007; Zeitoun and Mirumachi, 2008; Cascão, 2009; van Buuren and Warner, 2009; Mirumachi, 2015), to conduct hydro-political analyses of transboundary groundwater governance (Hussein, 2018), and to learn more on the development of conflict and cooperation in regional and local delta water management (Mutahara et al., 2019). In our paper, we use the TWINS model to analyse the interplay between upstream and downstream municipalities and the development of conflict and cooperation over time. We use the TWINS matrix to map the trajectory of this development and the coexistence of conflict and cooperation. In addition, to better understand the factors affecting the observed patterns of conflict and cooperation and decision-making in the action arenas, we use the politicised Institutional Analysis and Development (IAD) framework by Clement (2010), which is grounded in Ostrom's Institutional Analysis and Development framework (IAD) (Ostrom, 2005, 2007). Institutions are both the formal and informal rules of the game used by actors primarily involved in action situations. As argued by Waterstone (1996: 10), "if transboundary problems require changes in institutional arrangements for solution, clearly one essential step is the development of an appropriate framework for defining and analysing institutions". The IAD framework enables a fine-grained institutional analysis by disentangling the rich set of rules types. The politicised IAD framework by Clement (2010) emphasises the role of discursive, institutional, and contextual factors in explaining the patterns of interaction in action arenas and the outcomes of decision-making processes. In this paper, we will combine the TWINS model and politicised IAD framework to gain a better understanding of inter-municipal conflict and cooperation regarding flood risk policies for the Metropolitan City of Milan during the last 15 years (2004-2019).

[1] In the Natural Water Retention Measures (NWRM) overview, the European Commission (2013) makes a distinction between detention and retention basins. Detention and retention basins form part of the flood management infrastructure. Detention basins are kept dry when not used during floods, while retention basins contain water (e.g. ponds) throughout the year. The Seveso Project includes both detention and retention basins. In this paper, we generally refer to them as water storage reservoirs.

The paper is organised as follows. First, we introduce the TWINS model and the politicised IAD framework in more detail. Then we review our research methodology. In the analytical section, we present the results of our case study on inter-municipal conflict and cooperation in the Seveso River Basin. Finally, we draw conclusions and discuss the theoretical and practical implications of the main findings.

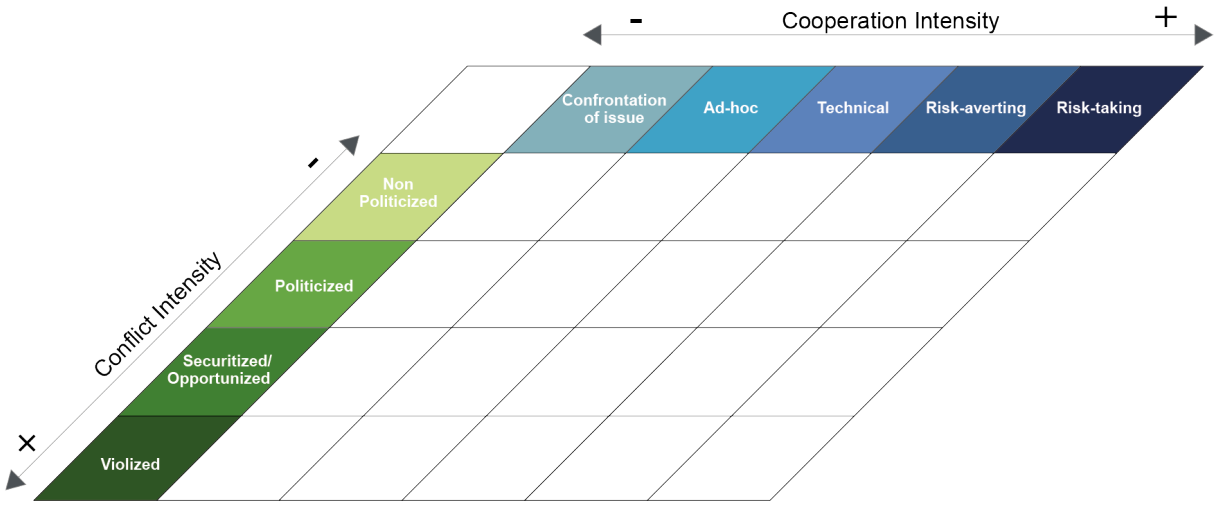
THEORETICAL FRAMEWORK

The Transboundary Water Interaction NexuS (TWINS) model

The Transboundary Water Interaction NexuS (TWINS) model offers a fine-grained tool for mapping the evolution of conflict and cooperation between the riparian states situated on international rivers. Transboundary water relationships are characterised by varying degrees of conflict and cooperation "played out in power-determined contexts" (Mirumachi and Allan, 2007: 1). Whether asymmetric power relations lead to hydro-hegemony and whether this is perceived positively or negatively depends on the interests and actions of the actors in the basin. Hegemons shape the rules of the game. Hydro-hegemony is perceived positively when hegemons also act in the interest of the weaker actors. On the contrary, negative hydro-hegemonic behaviour occurs when hegemons act to increase asymmetries and power inequalities (Zeitoun and Warner, 2006).

Several studies distinguish between relations dominated by conflict and those dominated by cooperation. As argued by Mirumachi and Allan (2007), most authors consider conflict and cooperation as two opposite sides of a *spectrum* or *continuum.* The analytical tool of a *continuum* is however inappropriate for capturing the "nuance of the complexities involved" (Zeitoun and Mirumachi, 2008: 5). The TWINS model (see Figure 1) examines the co-existence of conflict and cooperation between riparian states. The model assumes that "transboundary water interactions are not static but rather in constant flux, influenced by, and influencing, the broader political context in which they occur" (Mirumachi, 2015: 41).

Figure 1. TWINS matrix (Mirumachi and Allan, 2007).



According to the TWINS model, transboundary water relations can encompass four levels of conflict intensity (Warner, 2004; Mirumachi and Allan, 2007; Zeitoun, 2007). "Conflict intensity over transboundary waters increases as the perception of the issues by the state changes. As issues become more of a threat to the state, they are prioritized in the national agenda, thus receiving more attention

and attracting allocations of various state resources" (Mirumachi and Allan, 2007: 5). As Buzan et al., (1998) argue, issues that are not considered to concern the state, or issues that are not in the public domain agenda, are (1) non-politicised but once these issues gain a place in the political agenda, they become (2) politicised (Mirumachi and Allan, 2007; Mirumachi, 2015). If an issue is recognised as "an existential threat requiring emergency measures and justifying actions outside the normal bounds of political procedure", the issue becomes (3) securitised (Buzan et al., 1998: 23). Classifying something as a security issue can allow river managers to avoid interaction with stakeholders because the national interest is at stake and therefore action cannot be delayed. "Declaring something a security interest brings the issue into the arena of life and death issues, bypassing normal rights and rules of political engagement and legitimizing extraordinary measures and resources, thus bestowing powers on certain actors and institutions that they could otherwise not claim" (Buzan et al., 1998 cited in van Buuren and Warner, 2009: 424). Warner (2004) argues that issues become (4) opportunitised when there is the opportunity for improving a situation that allows for the implementation of actions outside the "normal bounds of political procedure" (Warner, 2004; Mirumachi and Allan, 2007: 5-6). Zeitoun (2007) considers securitisation and opportunitisation as opposite sides of one coin. Securitisation occurs when a threat justifies emergency actions; opportunitisation results when there is an opportunity of improving a situation that requires emergency actions. Finally, when violence is employed the issue ends up being (5) violised (Warner, 2004; Mirumachi and Allan, 2007).

In addition to the four levels of conflict, the TWINS model distinguishes five levels of cooperation intensity. Cooperation intensity is determined by "the extent to which there is an intention for collective action and common goals, operationalized through the identification of norms and ideas" (Mirumachi, 2015: 48). The level of cooperation intensity is based on four factors: (1) common goals, (2) joint action, (3) intention of contributing to collective action, and (4) belief that the other actors will contribute to collective action (Mirumachi and Allan, 2007; Mirumachi, 2015). The lowest level of cooperation intensity is the (1) confrontation of issues. "The issue is acknowledged but there is no specific joint action or identification and sharing of goals" (Mirumachi and Allan, 2007: 6). In the case of joint actions but no shared goals, cooperation takes the form of (2) ad hoc interaction. Shared goals but no joint action result in (3) technical cooperation.[2] In the presence of joint action and shared goals, "interactions can be considered as high in cooperation intensity; this level can be characterized as (4) risk-averting because the states do not undertake the unforeseen costs in the future when committing to such action" (Mirumachi and Allan, 2007: 6). In the end, (5) risk-taking is the ideal form of cooperation and is characterised by the fact that costs and risk are assumed (Mirumachi and Allan, 2007).

Although the TWINS model has been developed primarily for analysing conflict and cooperation between riparian states on international rivers, we contend that the model is equally useful for analysing the interactions between upstream and downstream municipalities within a catchment area. Also, conflict and cooperation cannot be seen as continua; the relationship may rather be characterised by co-existing intensities of cooperation and conflict, both of which may change over time.

The (politicised) IAD framework

Planning processes "are ultimately political processes in which actors bargain about the ultimate spatial functions that will be realized" (van Buuren and Warner, 2009: 422). Politicised approaches highlight the role of power asymmetries in certain decision-making processes. Some actors try to gain hegemony over the others, pushing in the direction of the outcomes that they most prefer. However, as van Buuren and Warner (2009: 422) state "project initiators dislike conflict not only because it slows down the process and trust base, but also because opponents may play by different rules". To better understand why

[2] As Mirumachi and Allan (2007: 6) argue, "the difference between these two intensities of cooperation is how actors shape their goals. In ad hoc interaction, two actors just so happen to be acting together but with different goals. When interaction becomes technical, there may be shared goals in how to solve a specific water-related problem, but actions and policies may not necessarily be aligned".

intensities of conflict and cooperation have changed over time in the Seveso River Basin, i.e. which factors may have determined the levels of conflict and cooperation, we draw on the politicised Institutional Analysis and Development (IAD) framework by Clement (2010), which builds on Ostrom (1986, 1990). The framework provides a means of investigating our case study by bringing attention to the relevant variables that should be considered when studying interactions between the actors in an action arena.

The action arena is the core of the IAD framework. The action arena is "a conceptual space in which actors inform themselves, consider alternative courses of action, make decisions, take action, and experience the consequences of these actions" (Polski and Ostrom, 1999: 20). The action situations are "the social spaces where individuals interact, exchange goods and services, solve problems, dominate one another, or fight (among the many things that individuals do in action situations)" (Ostrom, 2011: 11). Patterns of interactions result from the behaviour of the actors in the action arena (Polski and Ostrom, 1999).

According to Ostrom (2005, 2007), three types of exogenous factors influence the action arena: (1) physical/material conditions, (2) attributes of the community, and (3) rules-in-use. The physical/material conditions specify the attributes of the physical world around us and affect the course of actions and outcomes. In a catchment-based perspective, the respective locations of municipalities along a river creates different options and dependencies, commonly referred to as upstream-downstream relations. The attributes of the community encompass the preferences, values, knowledge, and beliefs of the participants in achieving certain outcomes, and their consideration of the other participants (Ostrom, 2007; Clement, 2010). The third set of variables is the rules-in-use, defined as "the minimal but necessary set of rules that are needed to explain policy-related actions, interactions, and outcomes" (Polski and Ostrom, 1999: 15). Seven general types of rules are identified. Position rules distinguish the roles of participants in an action situation and the positions that they hold. Boundary rules define which participants enter or leave the action arena and how they do so. Authority (or choice) rules describe the actions that participants may take in given positions based on their tasks and roles. Aggregation rules explain how decisions are taken (e.g. by command, consultation, vote, and consensus). Scope rules identify intended policy outcomes. Information rules refer to the type of information that is available to participants in an action arena. Finally, payoff rules determine the costs and benefits of each course of action.

The politicised Institutional Analysis and Development (IAD) framework by Clement (2008, 2010) enriches the IAD framework with two more exogenous variables: (4) politico-economic context and (5) discourses. Institutions are not only formed as the logical result of rational choices made by the actors. They are also shaped by the distribution of power which "is not the instrument of a dominant State, but rather is situated in the daily enforcement of social and political practices" (Foucault, 1975). The TWINS model reveals that those practices expose the distribution of power, and the role of power asymmetries in river basin management (Zeitoun and Warner, 2006). Drawing on the three dimensions of power by Lukes (2005), hydro-hegemons can exercise coercive, bargaining and ideational power (Mirumachi and Allan, 2007). Coercive power is mostly observed at higher levels of conflict in which material power such as military force is employed. Bargaining (agenda) power occurs in situations where "the rules of the game are controlled by offering no choices regarding compliance and noncompliance" (Mirumachi and Allan, 2007: 11). Ideational power is "power-over-ideas" (Zeitoun and Warner, 2006: 443). The politicised IAD framework by Clement (2010) encompasses the third dimension of power by Lukes (2005): "power manifests itself just by being, it shapes values, norms and preferences by its mere existence" (Clement, 2010: 135). According to that definition, institutions affect the power distribution and the distribution of power influences the design of the institutions (rules) to which participants would refer in order to account for their actions in the action arena.

Discourses strengthen or undermine new or existing institutions and institutions may reinforce dominant discourses and prevent marginal discourses from becoming dominant. Hajer (1995: 60) defines discourse as "a specific ensemble of ideas, concepts, and categorisations that are produced, reproduced,

and transformed in a particular set of practices and through which meaning is given to physical and social realities". The consideration of discourses contributes to the explanation as to why specific policy options have been favoured to the detriment of others. We will consider three discourses of resilience that are dominant in flood risk management (Vitale et al., 2020): (1) engineering, (2) ecological, and (3) socio-ecological resilience. Engineering resilience discourse supports the "domain of stability" (Holling, 1996). Drawing on the overview of flood risk management strategies provided by Oosterberg et al., (2005) and Meijerink and Dicke (2008), we link the discourse of engineering resilience to flood hazard reduction measures. Flood hazard reduction is generally achieved via technical measures (e.g. dams, dykes and spillways) and spatial measures (e.g. water storage reservoirs and multi-functional flood defences) in order to "keep floods away from urban areas" (Oosterberg et al., 2005: 23). Ecological and socio-ecological resilience discourses focus on reducing flood vulnerability by "preparing urban areas for floods" (via early warning and emergency measures or adjustments to the built environment) (Oosterberg et al., 2005: 24). They also minimise flood exposure by "keeping urban areas away from floods" (by preventing urbanisation in the floodplain or through de-urbanisation) (Oosterberg et al., 2005: 26). Engineering and (socio-) ecological resilience have in common the idea of a stable equilibrium, be it a pre-existing state to which the system bounces back (engineering) or a new state towards which it strives (ecological) (Davoudi et al., 2012). The discourse of socio-ecological resilience emphasises the role of people as "agents of the ecosystem" (Folke, 2006: 262) and their ability to cope with external disturbances (Adger, 2000).

CASE STUDY SELECTION AND RESEARCH METHODOLOGY

To gain a better understanding of inter-municipal conflict and cooperation on flood risk policies, we have employed a case study strategy. We have selected the Metropolitan City of Milan, which has long suffered from river flooding but has to date failed to reduce flood risks due to severe conflicts between the Municipality of Milan and the upstream municipalities in the Seveso River Basin. In 2004, the Po River Basin Authority[3] carried out an hydraulic study on the Lambro-Seveso-Olona River Basins.[4] Based on the results of this study, the Po River Basin Authority proposed the construction of a set of water storage reservoirs along the Seveso to reduce the flood risk in the Metropolitan City of Milan. Due to strong opposition from the upstream municipalities however, these storages have not yet been realised.

For the period 2004 to 2019, we have reconstructed the interactions between the upstream and downstream municipalities and determined the intensities of conflict and cooperation based on transcripts of interviews and reports of meetings in which flood risk policies have been discussed. The trajectory of these interactions has been sketched on the TWINS matrix. Next, we have used the politicised IAD framework as an ordering device so as to learn more about the variables, that potentially explain the observed patterns of interaction in the action arena in which Milan flood risk management policies have been discussed. Each variable of the theoretical framework was operationalised into a coding scheme. The qualitative data analysis was done by means of codes, queries, and cross-checks using the ATLAS TI software. Official documents, scientific papers, newspaper articles, newsletters, publicity materials, websites, conference proceedings, and videos were consulted to learn more on the variables of our framework. Furthermore, we conducted 20 semi-structured interviews with governmental and non-governmental actors. Respondents were selected according to their affiliation, their geographical location (considering the upstream or downstream position within the Seveso River Basin), their goals and tasks, and their stance on the Seveso Project (in favour or against). The variables (physical/material conditions and politico-economic context) were identified by the analysis of policy

[3] Introduced for the first time in 2006 (via legislative decree n.152/2006, art. 64), the hydrographic districts (each supervised by hydrographic district authorities) replaced respectively the former river basins and river basin authorities (ISPRA, 2019). In 2017, the Po Hydrographic District Authority became operational and replaced the former Po River Basin Authority (Autorità di Bacino Distrettuale del Fiume Po, n.d.).

[4] The original title of the study is "Studio di fattibilità della sistemazione idraulica dei corsi d'acqua naturali e artificiali all'interno dell'ambito idrografico di pianura Lambro – Olona" (2004).

documents and the secondary analysis of scientific papers. For the analysis of discourses, attributes of the community, and rules-in-use, we coded both written documents and transcripts of interviews.

INTER-MUNICIPAL CONFLICT AND COOPERATION IN THE SEVESO RIVER BASIN

In this section, we present the results of our analysis of inter-municipal conflict and cooperation on flood risk policies for the Metropolitan City of Milan. We first provide some basic characteristics of the Seveso River Basin, then use the TWINS matrix to sketch the development of inter-municipal conflict and cooperation on Milan flood risk policies. Finally, we discuss the politicised IAD as a further explanatory device for the observed patterns of interaction in the Seveso River Basin.

The Seveso River Basin

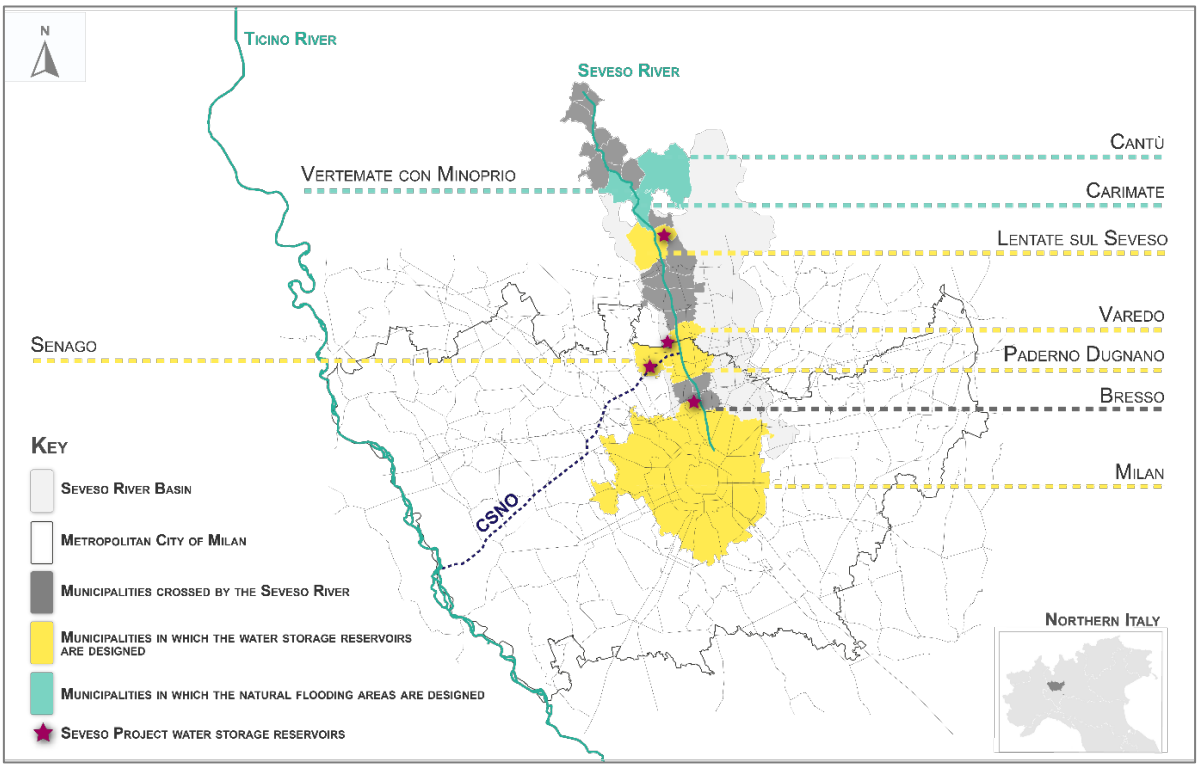
The Seveso River springs from the Pre-Alps (Northern Italy). It flows through the provinces of Como, Monza e Brianza, and Milan (now the Metropolitan City of Milan) and, after 50 km, it reaches the City of Milan (Regione Lombardia, 2018a) (see Figure 2). In the Municipality of Milan, the Seveso has flowed underground since it was covered to make room for rapid urbanisation during the last century (Di Quarto, 2017). The gradual increase in impervious surfaces since the 1950s has exacerbated urban run-off, with resultant effects on stream flow rates (Balducci et al., 2001; Legambiente, 2013; Mille et al., 2015). Upstream urbanisation has increased the hydraulic risk in the basin dramatically, with severe impacts on the downstream City of Milan, which is hit by floods periodically (Legambiente, 2013).

In the 1950s a spillway – the *Canale Scolmatore di Nord Ovest* (CSNO)[5] – was built to divert the water from the Seveso to the Ticino River and reduce the peak flow in the downstream City of Milan (Borrini and De Polo, 1985; Mille et al., 2015). Soon the CSNO became insufficient to prevent floods from occurring due to the increasing magnitude of rainfall events (La Montagna, 2010; AIPO, 2013). In addition, the Ticino – known as the 'blue river' for its good water quality – was being negatively affected by the poor water quality of the Seveso (Borrini and De Polo, 1985). In 2004, the works for increasing the flow rate of the CSNO started. However, they remained unfinished (Mille et al., 2015; Regione Lombardia, 2018b) because the local communities living along the Ticino and local environmental interest groups feared the negative impact of this enlargement on the ecological quality of the Ticino River (Borrini and De Polo, 1985).

Based on the available data, starting from 1979, 90 floods have affected the City of Milan (with an average of 2.5 per year). From 2005, 19 floods occurred with an average of 3.1 floods per year (AIPO, 2011). The years 2010 and 2014 proved to be exceptional, with the Seveso flooding eight times per year (AIPO, 2011; Mille et al., 2015). The quality of the water further aggravates the impact of floods. The Seveso is extremely polluted due to both industrial and domestic discharges of wastewater. "A few municipalities in the basin are not equipped with adequate sewage systems; the exceeding urban wastewater is directly discharged in the Seveso with highly negative impacts on water quality" (personal communication Environmental NGO Representative, 4 March 2019).

[5] The CNSO is 38 km long and has a flow rate of 30 m^3/sec (Balducci et al., 2001; Mille et al., 2015). The state financed 70% of the costs (Borrini and De Polo, 1985; AIPO, 2013). The Province of Milan and the *Magistrato per il Po* (currently Agenzia Interregionale per il Fiume Po - AIPO) handled the implementation phase.

Figure 2. Overview of hydrography in the Metropolitan City of Milan with references to the Seveso Project (elaborated by the authors).



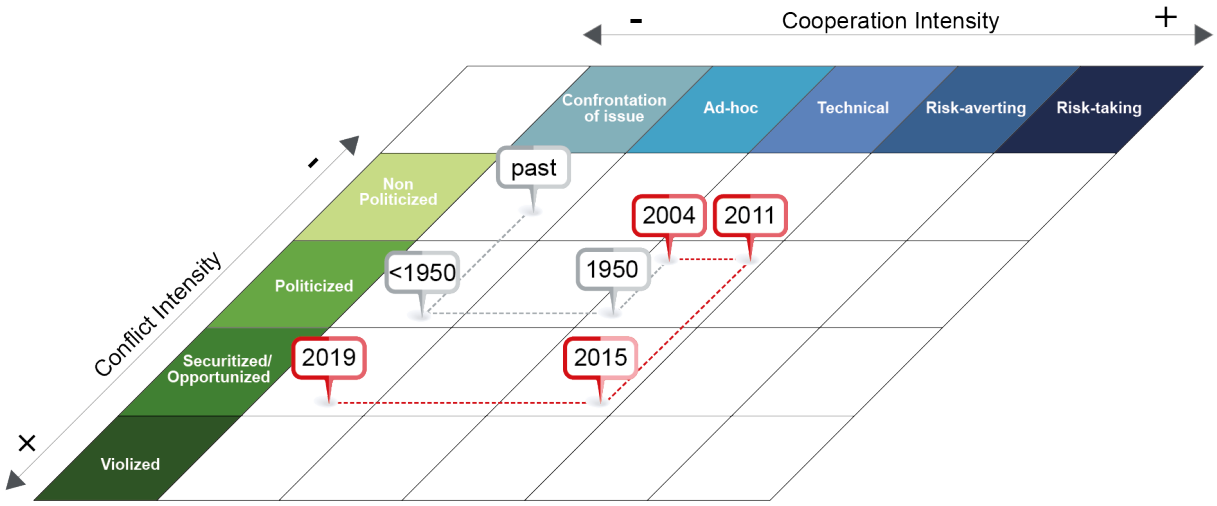
The development of inter-municipal conflict and cooperation on flood risk policies for the Metropolitan City of Milan

Rapid urbanisation in the Seveso River Basin since the 1950s has increased the frequency of floods in the Metropolitan City of Milan, making river flooding a politicised issue (see Figure 3). The acknowledgement of the flood risks and the potential consequences moved the cooperation from the confrontation of issue – no joint action and no shared goals – to technical cooperation which, in TWINS terms, means shared goals but no joint action to achieve them. The technical cooperation took place between a small, specialised number of actors who provided technical solutions, which were not broadly supported.

In 2004, the Po River Basin Authority carried out an hydraulic study on the Lambro-Seveso-Olona River Basins (Autorità di Bacino del Fiume Po, 2004; Mille et al., 2015). The study, updated by *Agenzia Interregionale per il Fiume Po (AIPO)*[6] in 2011 (AIPO, 2011), concluded with a proposal to build a set of water storage reservoirs along the Seveso to prevent floods (Mille et al., 2015). The main strategy, shared by the Po River Basin Authority and AIPO, was meant to solve the Seveso flooding problems within the Seveso River Basin in order to limit the need for diverting water to the Ticino via the CSNO (AIPO, 2011; Mille et al., 2015).

[6] AIPO was set up in 2003 by four regions in the Po River Basin (Piemonte, Lombardy, Emilia-Romagna, Veneto). In Lombardy, it has been formally established through the regional act n.5/2002. AIPO works as an implementation agency for flood risk issues and deals mainly with the implementation and maintenance of flood control infrastructure.

Figure 3. The TWINS matrix applied to flood risk management policies in the Seveso River Basin (elaborated by the authors).



When the Seveso flooded eight times in 2014, the Lombardy Region was solicited to provide definitive solutions to the Seveso issue. In the interests of public safety and in order to limit physical damages and economic losses caused by floods, the Seveso became a securitised issue. This allowed the region to bypass political engagement and legitimise the use of extraordinary measures and financial resources. The *Progetto Seveso Acque pulite, acque sicure* (here: Seveso Project) was the result of the securitisation. It was financed[7] through a programme agreement signed in 2015, and was conceived as a pilot project for basins with similar issues in Italy, such as the Sarno River Basin in the Campania Region (Mezzi, 2015). Following the recommendations of the hydraulic studies carried out by the Po River Basin Authority and AIPO, six natural expansion areas were planned upstream – in the municipalities of Vertemate con Minoprio, Cantú, and Carimate – and four excavated water storage reservoirs downstream – in the municipalities of Lentate sul Seveso, Paderno Dugnano, Varedo, Senago, and Milan (see Figure 2). Designed for floods with a return period of 100 years (AIPO, 2011; Mille et al., 2015), some of the water storage reservoirs were placed in agricultural areas, regional parks, or close to urban areas due to the extensive urbanisation and the lack of available space. The water storage reservoirs were to be lined to avoid exchange with the groundwater, due to the poor water quality in the Seveso (AIPO, 2011).

The interaction with the wider action arena was very limited. Local authorities and environmental stakeholder groups were therefore dissatisfied with the decision-making procedure from which they had been excluded, and whose decisions were communicated only when they had already been taken. Solid opposition therefore arose from the small municipalities upstream of the City of Milan. Opponents of the project complained about the strong top-down policy approach, the dominance of a few actors, the lack of involvement of local parties, and the "Milano-centric nature of the project, which aimed to preserve the City of Milan to the detriment of the small suburban municipalities" (personal communication Municipal Officer, 5 March 2019).

The first water storage reservoir was to be built in the Municipality of Lentate sul Seveso. AIPO was in charge of the design and implementation phases. The local government supported the project implementation and acted as a facilitator with the local community. The water storage reservoir designed between Paderno Dugnano and Varedo gained the support of the local government. It was designed to be placed on a former chemical industrial site (the former SNIA) that had fallen into disuse in early 2000

[7] In order to realise the water storage reservoirs, in 2015, a new programme agreement was signed by the state, Lombardy Region and the Metropolitan City of Milan to finance the *Progetto Seveso 'Acque pulite, acque sicure'* (here: Seveso Project).

and was now part of the regional contaminated sites available for reclamation (AIPO, 2017a). The Seveso Project was thus seen as an opportunity to convert the abandoned industrial site while pursuing the aim of flood risk mitigation. In contrast, significant opposition was raised against the implementation of the last two water storage reservoirs by the Senago and Bresso municipalities, in Senago and Milan respectively. There was disagreement with the type-specific flood control infrastructures, and citizens, environmental NGOs, and representatives of both local governments caused significant delays to the project implementation through opposition and court cases.

Senago opposed the Seveso Project for three main reasons. First, the Seveso does not flow through the municipal boundaries of Senago, which implies that Senago is not directly hit by floods. The water storage reservoir was designed along the CSNO and, "during the last decades, Senago was already affected by the realisation of CSNO and later by its enlargement, even though only partially completed" (personal communication Regional Officer, 5 March 2019). The second reason was that the poor water quality of the Seveso River made the structures less appealing. In a parliamentary question in 2016 the member for the European Parliament, Eleonora Evi, stated: "the Seveso is heavily polluted, as proved by the significant concentration of heavy metals, and thus highly risky for the health of the communities living along the river" (MilanoToday, 2016). The third reason involved the impact of the storage on land use, as it was sited in one of the areas preserved from urbanisation over recent decades. Since 2010, Senago has been opposing the Seveso Project implementation via no-confidence motions and by filing appeals to the competent courts and tribunals. In 2013, a few city councillors opposed the update of the Senago Urban Plan that included the storage sites, and which would have enforced the Seveso Project *de facto* in the municipal regulations. In 2014, the *Comitato No Vasche e Tutela del Territorio* was established (Associazione Rinnovamento Democratico per Senago, 2016). This citizens' committee took action several times, including submitting a petition to the European Parliament together with the mayor of Senago in 2018 to stop the Seveso Project implementation phase (Settegiorni, 2018). All the appeals were rejected.

Similar conflicts arose around the implementation of the water storage reservoir planned in the Municipality of Milan, on the border with the small Municipality of Bresso. The water storage was designed to be built in Parco Nord, a regional park on the border between Milan and Bresso, that had resisted urbanisation for many years. The Municipality of Bresso opposed the project for two main reasons. First, Bresso complained about the localisation of the water storage reservoir in Parco Nord. "The City of Milan has designed the basin as far as possible from the urban area of Milan, thus very close to the urban area of Bresso" (personal communication Municipal Officer, 5 March 2019). The second reason was that the poor water quality would threaten the health of the communities living close to the site. The water storage reservoir in Milan was planned only when studies showed that the diversion of peak flow via the CSNO would be insufficient to prevent floods in the City of Milan. Parco Nord, as a regional park, was formally entitled to express its opinion about the Seveso Project. Parco Nord initially opposed the project but after a process of negotiation with the Municipality of Milan, it was agreed that the work could proceed in exchange for environmental compensation. "Flood risk management works are exempt from environmental compensation measures being aimed at public interest; however, Parco Nord asked the Municipality of Milan and the region to turn existing urban brownfields into nature thus recovering the ecosystem services lost with the construction of the water storage reservoir" (personal communication Regional Park Officer, 4 March 2019).

Metropolitana Milanese,[8] in charge of the design and implementation of the water storage reservoir, collaborated with Parco Nord to adjust the design of the storage, mitigate its impacts, and provide the required environmental compensations. Similar to Senago, the Municipality of Bresso took several actions to stop the project implementation by filing appeals to the competent authorities. Again, an

[8] *Metropolitana Milanese* Spa is a company created by the City of Milan in 1955 to design and build the first underground lines. Since that time, it has participated in the building and management of major infrastructure in the city (Metropolitana Milanese, 2019). It is completely owned by the Municipality of Milan.

important role was played by the *Super Condominio*, a citizens' committee that independently filed appeals to the Italian and European court to stop the implementation of the Seveso Project. This citizens' committee represents the residents of the *Super Condominio*, a huge social-housing project (about 2000 residents) located on the riverside, on the border between the municipalities of Bresso and Milan. "The people living in the *Super Condominio* would be seriously affected by the water storage reservoir, more specifically by the poor water quality of the stored water" (personal communication Environmental NGO Representative, 4 March 2019). All the appeals, including those to the European Parliament and the Italian Council of Ministers, were rejected. The political leadership of the region, the Municipality of Milan, and the responsible minister were officially strengthened. The implementation phase is now ongoing.

In the Seveso Project, the cooperation remained technical with the risks assumed by a small group of actors. The limited interaction with the potential wider action arena pushed the Seveso issue back to the lowest level of cooperation, (the confrontation of issue) as a result of oppositions, claims, and delays.

Understanding the securitisation of flood risk management in the Metropolitan City of Milan

Physical/material conditions

Physical/ material conditions are very important in this case, as the conditions in the Seveso River Basin are severely limiting the range of policy options that can be taken to prevent flooding in Milan. The high population density and rate of urbanisation in the basin, particularly, have dramatically reduced the natural water storage capacity of the river and left limited space for river restoration. In addition, uncovering the river is not truly feasible due to the high building density in the City of Milan. These physical conditions limit the range of options available to reduce flood risks in Milan, and the severe water pollution makes the situation even worse. Flood events also create health risks and newly created water storage reservoirs run the risk of becoming sinks. Both the scarcity of space along the river and the pollution explain the upstream municipalities' strong opposition to the Seveso Project.

As formally required by the European Commission in the Water Framework Directive (WFD), the Po Hydrographic District Authority[9] has recently updated its water management plan (Autorità di Bacino Distrettuale del Fiume Po, 2020a). The updated plan defines the main goals to be achieved and the strategies to be implemented in the upcoming six years – the period corresponding to the WFD third management cycle. Among the others goals, the Po Hydrographic District Authority aims to achieve a good ecological and chemical status for the Seveso by the end of 2027[10] (Regione Lombardia, 2017; Autorità di Bacino Distrettuale del Fiume Po, 2020a). The Lombardy Region is already working to track and monitor discharges, improve the sewer systems, and build new wastewater treatment plants (Regione Lombardia, 2017).

Politico-economic context

An understanding of the politico-economic context is important if the power relationships between the actors involved in decision-making on flood risk policies for the Metropolitan City of Milan are to be understood. Lombardy is one of the most industrialised regions in Italy and it contributes one-fifth of the national gross domestic product (Regione Lombardia, 2018c). Based on the national funding programme *Italia Sicura*[11] (Italia Sicura, 2014; Redazione Legislazione Tecnica, 2017; Massa, 2018) which stimulated

[9] See footnote No. 3.

[10] Additional information on the current chemical and ecological status of the Lombardy rivers and future action plans can be found here: https://pianoacque.adbpo.it/piano-di-gestione-2021/

[11] In 2018, after the change of government, *Italia Sicura* was closed. Tasks, competencies, and personnel were transferred to the Ministry of the Environment and a new national strategy, *Proteggi Italia,* was implemented.

the implementation of flood protection infrastructures, the state, the Lombardy Region, and the Metropolitan City of Milan signed a programme agreement in 2015.

The economic power of the region may explain why the state makes financial resources available for flood risk management. Another interesting aspect is the relationship between the upstream and downstream municipalities. The Milan Municipality has the economic and political power to exert influence on flood risk management decision-making, which may explain why the city, unlike the upstream municipalities, is directly involved in the negotiations over the programme agreement. Interestingly, the downstream municipality is much more powerful than the upstream municipalities.

The Lombardy Region together with Milan and AIPO largely define the rules of the game and imposed the implementation of the water storage reservoirs (due to their bargaining power). The Po River Basin Authority and AIPO, actors in charge of hydraulic risk management, tried to convince others about the urgency of these flood control structures being implemented (ideational power) by making use of the results of the hydraulic studies. Weak actors like the municipalities of Bresso and Senago tried to contest the rules that had been imposed and look for tactics to change the *status quo* but without success.

In addition, the Milan Municipality was willing and able to contribute financially to the realisation of the Seveso Project, even though flood risk management is a state- and regionally-shared competence (Welfare Network, 2016). The political and economic power of Milan and its role in the decision-making process were heavily criticized by municipalities (such as Bresso) that would be affected by the implementation of the Seveso Project but which had not been involved in the decision-making.

Attributes of the community and beliefs/discourses

When one looks at the dominant discourses within the decision-making arenas, the following conclusions can be drawn. As a specific type of flood control infrastructure, the proposed water storage reservoirs support both engineering and (socio-) ecological resilience discourses. These structures are aimed at "keeping floods away from urban areas" (Oosterberg et al., 2005: 23) and reduce the probability of flooding by promoting a shift from hard engineering solutions (e.g. strengthening the banks) towards ecologically-oriented measures (e.g. creating room for the river). In the scientific debate, water storage reservoirs are labelled as nature-based solutions as they have the potential to integrate the goals of nature and biodiversity conservation with water safety measures, thus becoming an environmentally friendly option in flood risk management (European Commission, 2019).

The Seveso Project emphasised the use of water storage reservoirs not only for flood risk mitigation but also as green areas for nature or recreation. As pointed out by several of our interviewees, neither their natural nor their recreational purposes are likely to be achieved due to the poor water quality. "The water storage reservoirs worsen the quality of the areas in which they are designed to be built, because those areas – excluding the case of Varedo-Paderno Dugnano – are currently agricultural areas or natural parks" (personal communication, Environmental NGO Representative, 4 March 2019). The restoration or de-urbanisation of floodplains to restore the natural water capacity of the river system have not been considered as feasible options due to the societal impacts that such de-urbanisation would have.

Although the use of water storage reservoirs could potentially be a driver in a shift from engineering towards (socio-)ecological resilience, the lack of attention to procedural aspects, as well as to the design and lining of the reservoirs, water quality and ecological issues, all point to the dominance of the engineering resilience discourse. The small number of highly specialised actors – primarily hydraulic engineers – involved in the preparation of the Seveso Project believed that a relatively closed decision-making process would be more effective than a more inclusive, and hence more complex one. As a result, values other than water control and flood protection were poorly represented, and an integrated approach to flood risk management was not followed.

Rules-in-use

Position rules and boundary rules

Position rules (who holds which position) and boundary rules (who participates and who does not) are related. In 2015, the Lombardy Region, the Ministry of the Environment, the Presidency of the Council of Ministers, and the Metropolitan City of Milan signed a programme agreement to allocate financial resources for the implementation of the Seveso Project. The programme agreement was signed within the context of the *Struttura di Missione – Italia Sicura,*[12] which had been established by the state to deal with landslides and hydraulic risks. Established in 2014, *Italia Sicura* worked on the National Operational Plan for Interventions to Reduce Landslide and Flood Risk 2015-2020, which was published in May 2017. All of the financing of the Seveso Project was from national and regional sources, with the exception of the contribution by the City of Milan (Regione Lombardia, 2015). Financial resources were provided by the central government (112 million euros), the Municipality of Milan (20 million euros), and the Lombardy Region (10 million euros) (Comune di Milano, 2020).

The state, through the Ministry of the Environment, arranged the agreement, with the support of *Italia Sicura*. The president of the region is primarily responsible for the overall programme implementation and acts as a mediator with the central government (Regione Lombardia, 2015). The mayor of the Metropolitan City of Milan is required to facilitate the implementation of the works in order to overcome bureaucratic delays (Regione Lombardia, 2015).

The Lombardy Region appointed AIPO and the Municipality of Milan to design, implement and manage the water storage reservoirs. AIPO delivered the final project, which consisted of the construction of the natural expansion areas upstream and reservoirs downstream. Milan was tasked with the design and implementation of the reservoir planned in the City of Milan. The Municipality of Milan financed the water storage reservoir and entrusted the management of the work to its in-house *Metropolitana Milanese* society (Mille et al., 2015). As stated by one of our interviewees, "the municipalities, in which these reservoirs are planned, were not involved in the decision-making process but only informed of the final decisions; limited negotiations took place between the municipalities and the task force in charge of the management of the entire process" (personal communication Regional Officer, 5 March 2019).

Authority rules and aggregation (choice) rules

The authority rules (what actions are allowed or prohibited) and aggregation rules (how decisions are made in an action situation) all help explain what actions participants are allowed to take, depending on their positions in the action arena. The Lombardy Region incorporated the measures designed by the Seveso Project into the regional plan (last updated in 2019), and they thus became legally binding regulations in municipal land use plans (Regione Lombardia, 2019a). "The municipalities are obliged to introduce these measures in their local plans and, of course, this did not facilitate discussions" (personal communication Regional Officer, 7 March 2019). Due to the City of Milan providing sufficient finances to fund part of the project, it was charged with the design of the water storage reservoir in Milan and was involved in the Seveso Project decision-making.

The Lombardy Region, AIPO, and the Milan Municipality decided on the procedures and took the final decisions regarding the project. "The region is primarily responsible for the project implementation. We are the experts and we are the ones who can argue the validity of these choices. Several studies provided

[12] The *Struttura di Missione – Italia Sicura* coordinated with the Ministries of the Environment and Infrastructures. Together with the regions and provinces the ministries planned new interventions, stated in the 2015-2020 plan. The plan collated all of the requests coming from the presidents of the regions – special Government Commissioners for landslide and flood risks. In order to ensure that the most urgent measures were implemented, a priority plan finalised to landslide and flood risk mitigation in the Metropolitan Cities was arranged within the wider national operative plan. The Metropolitan Cities are characterised by significant risk conditions due to the potential causalities and economic damages in case of flooding (MATTM, 2015: 2).

evidence and supported the proposed actions" (personal communication Regional Officer, 6 March 2019).

Scope rules

The scope rules specify the intended policy outcomes. The Seveso Project was conceived with a rather narrow scope, as it focused mainly on flood risk mitigation. The project design did not address water quality issues fully, even though water quality has traditionally exacerbated the effects of floods over time and played a role in undermining the acceptance of the Seveso Project.

The strategy followed by AIPO during the design phase was twofold. Upstream of the Municipality of Lentate sul Seveso, AIPO worked with natural flood areas using free spaces along the riverbanks; an option that was not available between the Municipality of Lentate and the City of Milan due to urbanisation. Four water storage reservoirs were designed (see Figure 2) but these had to be located in agricultural areas or regional parks that were very close to the urban areas. Site selection was one of the main areas of disagreement.

The capacity of the water storage reservoirs was designed to keep the Seveso flow rate between 30-40 m^3/sec during flood events – the highest flow rate allowed in the Seveso when it enters the City of Milan underground. The studies carried out by AIPO and the Po River Basin Authority showed that the current flood discharge – with a return period of 100 years – is 140 m^3/sec. The Seveso Project was designed to divert the extra 100 m^3/sec upstream of the City of Milan (AIPO, 2011). The volume of the reservoirs was as follows: Lentate sul Seveso (808,000 m^3) (AIPO, 2016), Varedo and Paderno Dugnano (2, 100,000 m^3) (AIPO, 2017b), Senago (970,000 m^3)(AIPO, 2014), and Milan (250,000 m^3) (Comune di Milano, 2017). All of the reservoirs were lined to avoid any interaction with the groundwater due to the poor quality of the water in the Seveso (AIPO, 2011).

Information rules

The information rules concern the information available to the participants in the action arena. The specific information available to the participants in the action arena of the Seveso Project included technical reports, trends, and flood risk models. These were used to reach the final decision as to which measures should be implemented. The information that was provided to the wider action arena was, however, limited. Municipalities, citizens, and NGOs were not involved during the design phase and were generally informed when decisions were already made. Several interviewees asserted that information was not shared during the design phase in order to prevent lengthy discussions on the measures that were selected.

Payoff rules

The analysis ends with the payoff rules, which are the sanctions that can be imposed on actors if they do not comply with the agreements that have been made. The payoff rule of greatest relevance to this project is the ability of the state to withdraw funding for the project if implementation continues to be delayed, or if there is non-compliance with the programme agreements.

DISCUSSION AND CONCLUSIONS

Our main research question was: How can we understand the evolution of inter-municipal conflict and cooperation regarding flood risk policies for the Metropolitan City of Milan between 2004 and 2019?

The effects of climate change and the increasing frequency of flood events across Europe require a gradual shift in flood risk management towards the so-called risk-based approach. Italy has a long tradition of employing hydraulic engineering measures to cope with the risk of flooding. Only in very recent times has this dominant hydraulic paradigm been questioned. Advocates of a more integrated approach, including stakeholder participation and collaborative processes have gained increasing influence in political debates. This has resulted in new measures e.g. space for the river, green infrastructures being introduced as a means of change. Adopting new measures to cope with flood risks

may not, however, be enough to realise a paradigm shift. As an example, water storage reservoirs were offered as an innovative, tailor-made and environmentally friendly solution to tackle the risk of floods in the Seveso River Basin. The planning and design of the water storage reservoirs (a specific type of flood-control infrastructure) remained the task of hydraulic engineers, however, thereby limiting the interactions with, and input from other potential actors who "have access to it only through external ex-post remarks" (Osti, 2017: 279).

As a highly technical field, flood risk management calls for experts whose presence is crucial for building flood control infrastructures. Hydraulic engineers often have little experience in the implementation of landscape and environmental measures, and this may be further hindered by a lack of financial resources (Wolsink, 2006: 475). The call for innovative measures and new experts within the flood-risk management sector have often ended up within the "borders of the traditional political arena" (Osti, 2017: 269). The authorities in charge in Italy have put little effort into including values other than water safety in flood risk management, such as widening the realm of flood control infrastructures, opening up the decision-making process, or organising collaborative processes. By examining the attributes of the community and discourses, we found that the key actors in the Seveso River Basin largely ignored alternative solutions such as river restoration or other non-structural solutions; nor did they address the problem of poor water quality. Proposed in the interest of public safety, the Seveso Project relied on technical cooperation between a small set of actors. The implementation of flood control infrastructures was entrusted to a few highly specialised actors, primarily those who had endorsed the programme agreement in 2015. Along with procedural issues, the lack of attention to water quality and ecological issues, the design and lining of the reservoirs, and the limited consideration of other solutions all support the discourse of engineering resilience.

Although the European WFD demands better policy coordination, authorities have not been equipped to integrate environmental issues e.g. ecology, landscape values with old expertise and responsibilities. As stated by Wolsink (2006: 476), "the connection between the conjunctive management of water resources and water as an environmental and spatial factor, including the safety issue, obviously requires more coordination". Water quality issues have historically undermined the building of consensus regarding the implementation of the Seveso Project. The poor water quality in the Seveso River worsened the effects of floods in two ways: (1) the impact of flooding was more serious and (2) water storage reservoirs became much less attractive when they had collected polluted sediments. The Po Hydrographic District Authority has set the deadline for achieving 'good chemical and ecological status' in the Seveso River by the end of the third WFD management cycle in 2027. As explained in a formal communication by the European Commission, this will be possible (as reported in the WFD, Article No. 4) once the reasons for the delays have been resolved and on condition that the water quality in the Seveso does not worsen (Autorità di Bacino Distrettuale del Fiume Po, 2020b). The long timeframe that has been proposed for ameliorating the water quality issues, does however, concern environmental NGOs and citizens, as the water storage reservoirs will be constructed relatively quickly. "The Seveso water quality needs to be ameliorated now; we cannot accept to collect polluted water in these storages for the coming years" (personal communication Environmental NGO Representative, 4 March 2019).

Flood risk management includes not only structural and non-structural measures but also requires "societal transformations and successful governance approaches" (Driessen et al., 2016: 1). To support the transition towards increased social awareness and responsibility, more effective administrative and management systems are needed, along with new technologies (Warner et al., 2017). Openness and participation have been recognised as crucial for systematic deliberation, improving information and social learning (Pahl-Wostl, 2002), and enhancing disaster preparedness and risk perception (Miceli et al., 2008). The call for a more participatory approach is also highly encouraged by the WFD. By disentangling the rules-in-use, we found that the degree of participation was rather limited during the Seveso Project design and implementation stages, and was largely confined to the project dissemination stage. The decision-making process was characterised by a dominant top-down approach, narrow action arena, and

a low level of interaction with other stakeholders, namely the upstream municipalities where the water storage reservoirs were planned. River managers tend to justify their lack of interactions with stakeholders by framing flood risk as an urgent issue that needs to be addressed immediately. Framing an issue in "non-contestable security grounds ('securitization') is an increasingly frequent demonstration of the function of the exercise of discursive power" (Zeitoun et al., 2011: 162). As Warner (2017: 323) argues "in their capacity to 'adapt' to the traditional ways, advocates of the hydraulic mission have been able to sustain the tenets of their old prevailing paradigms to solve today's 'new' water management challenges". Recently, regional actors have acknowledged that the Lombardy Region could have arranged a more open and inclusive decision-making process. A regional officer explained that the decision to have few actors involved was meant "to limit the potential conflicts typically occurring in open decision-making processes" (personal communication Regional Officer, 5 March 2019). The key actors involved in the Seveso Project were not willing to invest in a time-consuming collaborative process.

The securitisation of the Seveso issue not only legitimised the implementation of the Seveso Project but also made it a priority over current policies. The water storage reservoirs were included, and their implementation prioritized as part of the action programme in the Seveso River Contract, last updated in 2019 (Regione Lombardia, 2019b). Developed in 2006, the Seveso River Contract represents the first attempt by the region to implement environmental measures identified as a result of the collaboration of actors invited to join voluntarily. Lombardy was one of the first regions in Italy to implement river contracts and it is still a frontrunner (Bastiani, 2011). The Seveso River Contract was a successful experiment. It strengthened the collaboration between authorities and actors regarding which measures to implement (Di Quarto, 2017). Even though river contracts are known for their participatory and open decision-making processes, however, the water storage reservoirs that are included in the Seveso River Contract for immediate implementation are still subject to much opposition. While river contracts have been increasingly implemented in Italy over the past few decades, and are thus challenging the dominant engineering resilience discourse, they are still undermined by the traditional forms of institutional cooperation that dominate the water management sector (Vitale et al., 2020). As shown by the Seveso case study, the programme agreement highlights that the central government, and to a lesser extent the regions, retain substantial decision-making power and economic control.

The securitisation of the issue resulted in a closed, centralised, top-down decision-making process. While this closed decision-making process enabled the parties to reach an agreement on the measures to be implemented relatively easily, it also resulted in problems with their implementation due to external opposition, and ensuing court cases. We can learn from our case study that insufficient effort to open up the decision-making process at an early stage of policy making might negatively influence the performance of the same policy at a later stage. As argued by Warner, "when a higher level of cooperation is realized, the process seems to be more resilient with regard to conflict. More conflict can be accommodated without immediately falling back towards a lower level of cooperation" (van Buuren and Warner, 2009: 438). Conflicts are still ongoing, but the political leaders in the Lombardy Region, the Municipality of Milan and the responsible minister are determined to continue working on the project. As Osti (2017: 266) claims, "these infrastructures have all the ingredients to be a contentious political issue, given the many people and stakeholders involved, the need to find rare rural spaces to occupy, the high cost of constructing the infrastructure and reducing its environmental impact". Better cooperation between government sectors is needed and it entails "mutual adjustments within the domains of both water and spatial development" (Wolsink, 2006: 478).

By combining the TWINS model and the politicised IAD framework in this paper we sought to explore the evolution of conflict and cooperation between upstream and downstream municipalities in the Seveso River Basin and the role played by contextual, discursive, and institutional factors in these patterns of interaction. The TWINS model proved to be useful for the analysis of inter-municipal conflict and cooperation in sub-national river basin management, as well as for tracing their evolution over time. One of the implications of applying the TWINS model at the inter-municipal level is that a better

understanding of conflicts and cooperation at a local scale may help to unravel the reasons behind regional or national policy implementation gaps. Securitisation is "not just the business of security professionals at the central level" (Warner, 2008: 256). Regional or local actors and NGOs, being directly responsible for land use planning and community-based actions (Slavíková et al., 2019), may play a role in protecting themselves against floods and also "against flood defence projects and policies" (Warner, 2008: 256). These actors are fundamental to ensuring the implementation and success of policies. As argued by Mutahara et al. (2019), by analysing regional or local conflict and cooperation we may be able to question decisions made at the regional and national level, thereby contributing to improved water governance. Although the multilevel governance promoted by the EU agenda fosters the decentralisation of responsibilities in flood risk reduction measures, the downscaling of these responsibilities is still lacking (Slavíková et al., 2019). In Italy, even though the regional government slowly undermined the central power of the state, the state has tried to regain some power via shared responsibilities. In this power play, local actors are barely considered.

The implementation of the Seveso Project has revealed simultaneous processes of conflict and cooperation – "a simultaneity that the Mirumachi/Allan matrix expressly calls our attention to" (van Buuren and Warner, 2009). The TWINS matrix has been useful in visualising complex combinations and dynamics between conflict and cooperation that go beyond simplistic cooperation and conflict dichotomies (van Buuren and Warner, 2009). Changing to include increased cooperation is an incremental process, and one in which it is easy to fall back to lower levels of cooperation and increased conflict. A consideration of the distribution of power helped to unravel the complexity of upstream-downstream interactions, which are not determined purely by the relative positions of actors within a river basin. Whereas the TWINS model has helped trace the various degrees of conflict and cooperation, it does not address the institutional and contextual aspects, which may in turn affect both conflict and cooperation. The politicised IAD, as an analytical ordering device, emphasised the importance of discourses and power distribution, together with institutional and contextual factors in shaping the actors' interactions in the action arena and therefore the outcomes of decision-making processes.

By combining the two models, we learnt that there is a two-way relationship between institutional conditions and levels of conflict and cooperation (such as the securitisation of the issue). Because of this two-way relationship, negative patterns may be reinforced. On the one hand, securitisation leads to a closed decision-making process that includes a relatively small number of actors. On the other hand, a narrow action arena may explain the resistance of the actors who have not been consulted, to the final decisions and thus the emergence of new conflicts.

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