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The Anti-Flood Detention Basin Projects in Northern Italy. New Wine in Old Bottles?

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ABSTRACT: An increased number of floods have affected the thick urban network located in Northern Italy. The towns traversed by the many rivers descending from the Alps and Apennines must address the problem of retarding water overflow. Detention basins have been envisaged as a good means to achieve more secure protection against floods for thick urban settings.

In Italy, flood prevention policies have been partially decentralized to regions. In this study, the literature on political economy, policy analysis and governance is used to frame the planning and implementation of detention basins. Each approach raises questions on whether and how detention basins represent a return to hard water infrastructures. Three ongoing detention basin projects located in northern Italy have been chosen to illustrate the coalition of interests that support this policy of flood prevention. The selection of cases and their analysis are based on a comparative method considering both similarities and differences between detention basins.

Although governance is highlighted in official documents regarding water policies, this approach has been followed to a very limited extent. The traditional policy community has been able to maintain leadership on projects, including a limited amount of new disciplines and expertise. Moreover, the emphasis on planning expertise creates some space for the governmentality approach. Overall, detention basins represent not a return to heavy infrastructures, but a continuation of traditional intervention methods with small greening changes. However, margins for a softer policy are possible through either recovering old containers/floodplains or developing a network of farm ponds and minor dikes.

KEYWORDS: Flood prevention, detention basin, policy community, governance, Italian Regions

INTRODUCTION

Flood prevention is an issue of growing concern throughout the world. In Italy, an increased number of floods have affected the dense urban network consisting of residential areas, industrial zones and infrastructures located in the northern part of the country known as the Po Valley. This is an area rich with rivers and streams descending from the Alps and Apennines. The main towns of the Po Valley are situated at the foot of these mountain chains. In recent years, the most damaging episodes of flooding have not been caused by the longest rivers (Po and Adige) but by their tributaries, which have a more torrential regime. The problem is that most of them cross important urban areas before contributing their water to the main rivers. The latter have undergone huge public works in the past – especially the strengthening of banks – and they are now more secure than the tributaries. Furthermore, especially the River Po has wide floodplains relatively empty of houses and activities, so that exceptional flows of water can be more easily contained.

For the towns crossed by secondary rivers there is a problem of retarding water overflow. Detention basins¹ have been envisaged as good devices to achieve more secure protection against floods for dense urban settings. They are not a new way to address the problem, but the demand for their construction has recently multiplied. The numerous hydroelectric dams cannot be used to regulate excess flows because they are located in the highest parts of valleys, while the heavy rains are often circumscribed to small areas downstream.

Detention basins located in the middle section of the river course are seen as the most fitting solution for flood prevention. Some detention basins have been created in the past in Northern Italy; many more are planned for the near future. Their morphology varies greatly according to the form of the river course and the empty space in which to create them. The spatial and social impact of detention basins is very high in an area so densely populated and networked as the Po Valley.

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. Moreover, its visibility introduces many symbolic aspects of policies, such as consensus building, the image of security, and the search for an urban-rural cost-benefit balance. In short, they highlight the dovetailing of symbolic and material dimensions of policies.

The detention basin policy is useful for clarifying, if not answering, the main question of this special issue: is the construction of detention basins to be considered a return to heavy, supply-side water infrastructures? The question is plausible because an intense phase of demand-side policies for water security has been inaugurated by the European Union (Directive 2007/60/EC), and in Italy by the so-called 'river contracts'.² The specific question addressed in this paper concerns the inclusion of new expertise and lay knowledge in the planning of detention basins. In other words, are these infrastructures combined with a wave of participation or are they simply 'new wine in old bottles'. They claim to be a shared innovative solution to floods, but participation is only apparent and other more committing solutions like river enlargement, water harvesting and micro-channel improvement are neglected.

The question of a return of heavy infrastructures requires a definition of temporal stages, too. In Italy a turning point signalled in the literature is the enactment of Law 183/1989.³ In Europe the turning point is codified as the passage from a *flood protection* to a *risk management* policy in the 1990s (see Hartmann, 2011: 91). But, which criteria can be used to define the turning point? Hypothetically, change is measured by three elements: decentralization of decision making, introduction of deliberative

¹ In the US water management literature, a distinction is drawn between detention and retention basins www.waterworld.com/articles/print/volume-23/issue-7/feature/stormwater-detention-and-retention-systems.html (visited 29 November 2016). The former are water containers used for flood prevention and kept dry for the rest of the time. The latter, called also 'wet ponds', are containers with a residual quantity of water maintained in ordinary time. In Europe, the topic is analysed by the European Natural Water Retention Measures EU Platform (nwrme.eu).

² The river contracts are all-inclusive experiences of private/public partnership (Voghera, 2015). In Italy there are more than one hundred cases (Gusmaroli, 2013).

³ "This law can be considered innovative under three main profiles: [1] the definition of the River Basin as an optimal area of intervention for an integrated policy of soil protection and water management [2] the creation of the Basin Authorities, which involve the participation of both the State and the Regions, autonomous and endowed with technical skills and financial means; [3] the design of a Basin Plan, as a planning instrument within the River Basin, which involves cognitive, normative and technical components" (Goria and Lugaresi, 2002: 11). In 1995 a non-profit organization (Gruppo 183) inspired by that Law was created. It comprised a variety of experts, not only engineers, but also planners, geologists and architects. The monopoly of the engineers' epistemic community was therefore broken (Meijerink, 2005). The main objective of the Gruppo 183 is the integration of water skills and uses for reaching a wider security of territories. An inclination favourable to soft interventions and civic participation is mentioned in their rationale.

www.gruppo183.org/schedaistituzionale.asp?idreferenza=19&idpadrerifistituzionali=11, visited 29 November 2016

procedures, adoption of practices of water security at household, community and district level, like water harvesting, village/block ponds or improved trench networks. The last element also identifies 'soft infrastructure' for water security in the sense that it is "a decentralised, bottom-up, flexible management structure and stakeholder engagement" (Zevenbergen et al., 2008: 85). In conclusion, is the recent wave of planned DBs in Italy a) an innovation according to the Law and to Group 183 philosophy,⁴ b) a return to strong infrastructures of the old water security policy, c) a signal of continuity of the old policy with minimal changes?

THE SOCIO-POLITICAL FRAMEWORK

The question of whether detention basins represent a radical change toward reaffirmation of infrastructures using a more participatory method can be framed in social science according to three traditions of thought. The first one – which we generically call 'political economy' (Bauer, 1997; Jones, 2015; Harris, Kooy and Jones, 2011) – uses Marxian categories applied not only to labour relationships but also to nature and territories. Capitalism is a driving force, a recursive process of accumulation by dispossession (Harvey, 2004). Water is presented in the same way. "Under the current neo-liberal hegemony, water rights are increasingly articulated via dynamics of commodification of water, private appropriation of water resources, dispossession tactics" (Swyngedouw, 2009: 58). It is an all-encompassing economic trend dominating society and institutions. Neo-liberalism is conceived as a force provoking "the privatization and marketisation of ever more aspects of biophysical reality, with the state and civil society groups facilitating this and/or regulating only its worst consequences" (Castree, 2008, quoted in Pellizzoni, 2015: 60).

The difference between classical liberalism and neo-liberalism is conceptualized as a passage from nature as a limit to growth possibly overcome by its further mastery to a form of nature whose limits are used for the increasing commodification of things and relationships. "In other words, in contrast to liberalism, nature is no longer regarded as an ultimate irreversible barrier, but as a constraint that can be strategically manipulated" (Pellizzoni, 2015: 60).

In this regard, the neo-liberal approach moves toward a governmentality perspective: the extraction of value is no longer an external pressure on human bodies or natural environments but a process modifying the internal mechanisms of their functioning. The uncertainty due to misuse of the environment is a chance to invent, produce and sell new more sophisticated devices that in the end increase capitalist accumulation. Water infrastructures, especially when they are presented as soft measures or forms of bio-imitation (e.g. 'constructed wetlands'), are therefore seen as new frontiers of environment and people control. The intervention on water security is no longer a matter of violent change to the nature of things but a mimetic attitude of capitalism able to bring everything back to the flow of commodification. In this view, the policy is not a simple manipulation of cultural frames, an ideological construction masking reality, but a material and operational task reshaping the nature of objects. Artificiality and naturalness are no longer an issue because this dichotomy has been overcome by the facts.

The second tradition of thought is more internal to political and administrative structures and can be called a policy analysis approach. Political-administrative systems (Easton, 1953) have a strong inertia, and their change is usually slow and incremental; the direction of change depends greatly on past events and how the process has been initially framed. It is easy to identify the core of this approach in the past/path dependency. "Path dependence demonstrates that institutional and technological infrastructure frequently becomes entrenched once decisions to pursue certain policy and management

⁴ See Footnote 3.

paths are implemented" (Burnham et al., 2016: 4). The political subsystem is more sensitive to internal demands and quite able to select the external ones in a way not to change its equilibrium excessively.

Insisting on resistance to change provided by the political apparatus says nothing about the 'form of change'. Punctuated equilibrium theory – an approach centred on rapid and short changes – is only apparently dissimilar to that of path dependency (Meijerink, 2005). "The example of water policy changes related to the San Francisco Bay Delta Watershed [helps] to demonstrate circumstances under which, instead of gridlock and crisis among various water users, sharp departure from past water policy was accepted" (Burnham et al., 2016: 4). The causes of such a change have been identified in the exposure of previous policy failure, the capacity to reformulate the problem, social mobilization facilitated by policy entrepreneurs, and casting the new policy as experimental (Meijerink and Huitema, 2010).

Changes are essentially seen as internal to the political subsystem. Short intense windows of change are tolerated and absorbed into a more general path of slow motion. These approaches show that the main variable is not the pace of change, but the internal mechanisms reframing the issues, together with the rise of new policy entrepreneurs. New frames and leaders can arise from public opinion or social movements, but the path is the inclusion in traditional political channels. Even more important is the combination of factors: the right moment (e.g. after a dramatic event like a flood), the capture of external funds, and the ambition of emergent political leaders searching for demonstrable works. These factors and many others open windows of opportunity, temporal spaces of action. Furthermore, windows of opportunity are not only temporal; they are also spatial: the identification of the place where to construct the public work is very contingent and almost impossible in the absence of rural 'buffer' zones (Haeuber, 1996).

The third approach is based on the concept of governance. This shifts the attention from the internal dimension of the political-administrative system to its interactions with social groups. According to Monteleone (2007), governance has four characteristics: 1) a plurality of private and public actors participate in the implementation of policies from their beginning (conception, design), 2) a new complex policy issue (e.g. climate change), 3) the need to coordinate a plurality of actors and solutions, 4) the de-legitimization of decision-making forms based exclusively on public authority, and frequent use of negotiation. Furthermore, a scaling process also often occurs, with the "diffusion of power, authority and competencies from the nation state to private, international and sub-national players and levels" (Arnouts and Arts, 2009: 202).

The definition of governance should have a distinct mention for non-profit organizations. These are neither public nor private, but certainly important for the success of governance. "Network governance constitutes a distinct form of coordinating economic activity (...) which contrasts and competes with markets and hierarchies" (Candace et al., 1997: 914). Negotiations between private interests and public officials have always been so intense and exclusive that the term 'policy community' was coined. The same authors of punctuated equilibrium theory (Baumgartner and Jones, 1993) use this term, contrasting it with 'policy network' in which a larger number of social actors participate in decision making. Without the presence of NGOs, committed to general interests like environment protection, public health, and the fight against poverty, governance would be nothing new.

The introduction of governance does not mean that power and hierarchy disappear, and "top-down, hierarchical steering remains rather prominent" (Arnouts and Arts, 2009: 226). Policy networks are 'flatter' than traditional autocratic public bodies, but they differ internally in terms of access to media and public funds, manipulation of discourses, secret agreements, differential rhetorical capacities, and so on. Social participation in policies is frustrated by the absence of, or delay in, decision-making capacity (Hernández-Mora et al., 2015). The main risk is that the inclusion of civil society groups is a symbolic policy, quite useful for social learning but indifferent to the final implementation of policy (Boussaguet, 2016).

In the next section we will see whether and how the three theoretical approaches shed light on water infrastructures. These approaches provide useful starting points for building a broad framework based respectively on three socio-political abilities: of dominant economic interests to keep their power intact; of the administrative-political subsystem on adapting new inputs to its own way of working; and of organized social groups to reduce the democratic deficit of technocratic agencies. These are not antagonist explanations; more modestly each of them underlines different aspects of a phenomenon: the return of water infrastructure.

THE WATER INFRASTRUCTURES THROUGH THE LENS OF THE SOCIO-POLITICAL FRAMEWORK

According to a political economy approach, detention basins, and water infrastructures in general, are not a return but a continuation of the same policy with apparently new devices. The duopoly that has governed the internal water security sector has been adept at reformulating the solutions and keeping the economic rewards of financial actors almost intact. The duopoly is formed by the strong alliance between construction firms and civil engineering managers;⁵ the rewards are not only money but also professional prestige, career advancement, and a sense of mastery over nature.

The sense of efficacy in controlling water flow peaks (mastery) at first glance has no relation to governmentality; detention basins are works explicitly intended to control phenomena which have become more variable (Castellari and Artale, 2010). Devices are more sophisticated because the water container is equipped with closely connected monitoring systems and built with the techniques of grey engineering (Palmer et al., 2015). A sort of smart water system is installed, and this capacity to manage higher uncertainty is a chance for the economic-technical apparatus to make further gains in terms of knowledge, recognition and projects assignment (see DeKeles, 2015).

Other conjectures on governmentality are pertinent if we enlarge the discourse to include measures complementary to detention basins. New water security policies (e.g. Directive 2007/60/EC on the assessment and management of flood risks) insist on participation by all the population in flood prevention. Citizens must be prepared to react promptly to water threats. The invitation to self-reliance is interpreted by scholars of governmentality as a form of 'control at a distance' (Warner et al., 2008: 130).

In the policy analysis approach, DBs can be conceptualized as a change in the mix of interests (policy community) governing the water security sector. Climate change and the enormous damage provoked by floods apply pressure on authorities to find new solutions, keeping the borders of political arena within the usual framework. "A measure of the success of the ruling coalition is its ability to absorb new policy challenges without abandoning [their] 'deep core beliefs'" (Potter and Wolf, 2014: 399). Potter and Wolf introduce an important cognitive strategy: the capacity to show that new problems ('new wine') can be faced within their own cultural framework ('old bottle').

Floods have a wide media impact. At the same time, they are remembered for a long time by people, becoming historical turning points. When a disaster occurs, the political subsystem must demonstrate its capacity to react, to do something. This reaction must be visible and easily accountable. A detention basin, so impressively present in the landscape, works perfectly on people's imagination, especially in Mediterranean countries (del Moral, 2009: 87). It is of secondary importance to show its efficacy, because floods are irregular in form and pace. The proof of a detention basin's efficacy can arrive decades after its construction.

⁵ Rainaldi (2010: 68-69) does not use the term 'duopoly' for the Italian water policy community, but her representation of the sector is very similar: dominance of engineering expertise, alliance with private companies, information asymmetry with local authority, highly standardized solutions: a sort of hegemonic community. Noteworthy, in this community experts of public bodies are usually more influent than government representatives.

In order to survive, the policy community must co-opt a small number of new actors and issues in the decision-making process. Those assuring the widest legitimation are preferred (Terlouw, 2014). Environmental activists and issues fit this requirement very well because they represent general interests and are easily connected with climate change, the ultimate cause of floods (Bruzzone, 2013).

The strategic inclusion of new actors-issues in the policy community is not without political risks. The call for participation – generally invoked to reduce the democratic deficit of public institutions – triggers protests and demands to enter the war room. Furthermore, the protest can mount and go as far as to call for a radical change of the project and/or political leaders. Attempts to control society by co-optation of its single parts can fail, leaving room for deep modifications overriding the specific issue. There are interesting cases in which mobilization against an infrastructure has permitted the rise of a new power elite (Martin, 2007). This is controversial because the claims of social movement leaders can be simply seen as a way to by-pass a traditional political career to arrive directly at important institutional roles.

The governance approach generates original questions on DB planning: are there alternatives to DB? What is the role of expertise? Is the participation of citizens in decision making genuine? Lay knowledge can provide important insights for the prevention of and reaction to floods (Fresque-Baxter and Kelly, 2017). Local people usually know the effects of topography on stormwater movement better. They can thus propose alternative sites for the construction of the detention basin, or alternatives to the detention basin itself.

Expertise is crucial for DBs.⁶ As already said, the dominant expertise in water security management has always been engineering. However, critics have emerged on this monopoly of policy knowledge. Hydraulic engineers themselves understand that their know-how is limited and rigid. Some stakeholders, like the Group 183 (see note 3), call for the use of social sciences, new methods of interaction with lay people and politicians, and interdisciplinary and shared decision making or, in other words, an insertion of deliberative approaches into the realm of formalized expertise.. Nevertheless, "the relation between governance and technology is deeply ambivalent" (Broekhans and Ruijgh-van der Ploeg, 2012: 21).

Detention basin projects can give way to various forms of participation. Participation can be induced by the authorities in order to comply with rules and protocols; they can be a spontaneous mobilization of citizens, also outside traditional advocacy associations. Frequently it is a matter of interaction between the authorities and organized citizens, with possible involvement of private companies interested in the realization of the infrastructure. Broekhans and Ruijgh-van der Ploeg (2012: 26), with the intention of highlighting a network approach to the governance of water infrastructures, talk of "casual results of on-going interaction between interested parties who aim to solve complex societal problems". These authors assume that results go beyond the motivation and the strategies of actors. Relationships, negotiations or coalitions are autonomous objects of research, as the expression 'casual results' suggests.

Schematically, the three approaches raise questions as to why and how detention basins have emerged: the political economy approach supports the idea that a strong and restricted public-private alliance sees DBs as a chance to reaffirm their power and rewards in the rich and strategic sector of water security. The water management policy subsystem, with the mission of dealing with inputs and feed-backs, sees DBs as a way to simplify an issue that has become too complex, a way to cut a Gordian

⁶ Experts are seen in the three approaches (political economy, policy subsystem and governance) respectively as a distinct interest group, often inserted in "a narrow nexus of bureaucrats, technical experts and financiers" (Swatuk, 2008: 26); an information input of policy subsystem to be instrumentally used by political entrepreneurs (Weible, 2008); "citizens and the public have a stake in the science-politics interface, which can no longer be viewed as an exclusive domain for scientific experts and policy-makers only" (Bäckstrand, 2003: 24).

knot. In the governance approach, the DBs are seen as the fruit of a deliberative process: a decision made after a long recursive consultation and discussion with a wide range of stakeholders and civic organizations. These questions will be addressed through the case of three projects aimed at preventing floods through one or more detention basins.

DETENTION BASINS AS MULTIDIMENSIONAL INFRASTRUCTURES

The three projects are located in the Po Valley (Italy). The main purpose of these projects is the construction of a detention basin. One of them envisages more than one basin with permanent water (retention basins). They have been chosen to illustrate a wide spectrum of water security policies.

The basins are concrete and visible infrastructures, functional artefacts with particular material capacities. In this vein, DBs are presented by the water authorities as a strong and definitive solution to recurrent floods. Infrastructural artefacts, however, not only have a functional goal but other dimensions as well: they can also be an occasion for meetings (De Boeck, 2012), for claiming rights (Amin, 2014), and for exerting control (Bichsel, 2016). The DB projects restore the function of floodplains, too often sacrificed to urbanization. Studying DBs provides insightful information on the complex and contested matter of water management, because they are important infrastructural means to connect people, groups, organizations, and institutions. If structures are a set of stable relationships, infrastructures are meta-relationships, in the sense that they facilitate other relations.

In the case of water, which is already a means to connect different places, the infrastructures have a special meaning because they link and divide at the same time. In other words, they are filters, valves, funnels, turbines, all of which are devices channelling water and modifying its speed. Infrastructures can also be seen as separators of land and water. Societies have developed a variety of tools for delimiting land and water precisely (Warner et al., 2010). These infrastructures have been used to increase the productive value of land and water. Irrigated fields and lands subtracted from river beds increase respectively the productivity and production of human labour. Since the Mesopotamian civilizations, control of hydro-infrastructure has been a source of hegemonic relationships (Swyngedouw, 2009; Bichsel, 2016). Such a strong instrument of power cannot be separated from symbolic meanings. Infrastructures are also objects to which sentiments are attached (Larkin, 2013), like a sense of belonging and a feeling of deference to their magnificence. Big dams and hydropower stations are frequently visited by groups of primary school pupils and tourists. Detention basins are very similar attractive products of human ability to master water flows.

METHOD, INFORMATION SOURCES AND CASE STUDIES

The method of analysis consists of selecting water-retarding projects that present a mix of similar and different aspects. This technique is also qualified as 'comparative analysis' because it keeps some aspects of the cases studied constant – e.g. the watershed morphology – and seeks variability in the way in which the projects have been implemented, hoping that these differences can have explanatory value. Such aspects form a socio-technical packages (Amin, 2014), and in the case of DBs they include the entire policy process from its conception to full realization and practical use.

Other aspects of the DBs chosen respond to the need for combining similarities and differences. The three cases – the so-called containers (*vasche*) of Senago, the detention basin (*bacino di laminazione*) of Caldogno, the upgrading (*riqualificazione*) of the Ronco-Bidente river containers – are located in Northern Italy (Figure 1). But they belong to three different watersheds, respectively the Po Valley (the Seveso River), Brenta-Bacchiglione (the Timonchio River) and Romagna (the Ronco-Bidente River). All the rivers, whose waters have to be retarded in case of abundant flow, are short and with high declivity (torrential regime). Another feature shared by the rivers is that they flow through an important town in the middle of their course. This is a decisive reason for the construction of an upstream container. So

strong is the pressure of downstream urban areas that the concept of 'urbannormativity' – a cultural subordination of rural areas to urban rules - is fitting (Bakker, 2015: 222-3).



Figure 1. Localization with a () of the three detention basin projects in the Po River Valley.



Source: Google Earth

The comparative analysis assumes that the processes under scrutiny vary in crucial respects. They are:

- The water-retarding containers have a different design: for Senago, two deep basins will be dug under the land level. For Caldogno, the basin is above the land level and the water will be contained with earthen banks. The project on the Ronco-Bidente is a sequence of already-existing containers to be reshaped in order to increase their water capacity. This variety of forms implies different costs and environmental impacts (Table 1).
- The three projects are located in regions with different political-administrative traditions. The Ronco-Bidente area is located in Emilia-Romagna, a region with a strong presence of the former Communist Party and therefore more direct intervention by public bodies in the economy and spatial planning (Putnam, 1994; Loughlin, 2001). The other two areas, although located in different regions, have a similar political background (centre-right coalitions), now marked by the dominance of the Northern League, a 'regional party' (Diamanti, 1995). Nevertheless, there are important administrative differences between the last two areas. The Senago project in Lombardy has been designed by an interregional body (AIPO-Agenzia interregionale per il fiume Po), quite independent from the respective Regions, while the Caldogno detention basin has been conceived and planned directly by civil engineers (*Genio Civile*) of the Veneto Region. To be noted is the variable presence of the State in the three cases: in Ronco-Bidente it will fund all

the works; in Caldogno the State finances a quota, while for Senago, most funds come from Milan utility companies managing public transport.⁷

- A further source of variability derives from the stage reached by the projects, even if their beginnings are largely the same (Table 1): the construction of the Senago vasche has not yet started (December 2016), also because of strong opposition by the municipality; the Ronco-Bidente, being a sequence of interventions, has the advantage of a lesser visual impact. Eight interventions are currently being implemented, six operatively projected and three only planned.⁸ The Caldogno project was finished at the end of 2016.

We can then classify the three projects in order of conflict intensity: low for the Emilia-Romagna case, medium for the Veneto one, and high for the Lombardy one. The differences in conflict level entail variations in media information. When the opposition is stronger and involves public bodies, like the Senago municipality, the media coverage is very high and more information circulates in newspapers and on social media; in the opposite situation, the information is less in quantity and more deferential to the project's promoters. This situation can also be interpreted as depoliticization of the issue (Swyngedouw, 2005).

In general, the information on the cases has been gathered from official documents: the main ones are cited in Table 1. Interviews were conducted with the mayors of Caldogno and Senago, civil engineers working for the Veneto and Emilia-Romagna Regions, key informants and members of environmental organizations. Direct observations in places designated for DBs projects were conducted several times during 2015-2016.⁹

RESULTS

The comparative analysis addresses the three issues of our framework: 1) the importance of elite interest groups (policy hegemony), 2) the importance of balances internal to public administration (policy community), and 3) the importance of governance (policy network) in the promotion and realization of water security infrastructures. Each issue will be presented for each case using the same order: Senago, Caldogno and Ronco-Bidente

1 - *Policy hegemony*. The detention basins wave can be seen as a reaction to the crisis of the construction sector. The economic crisis that began in 2008 was widely caused by financial speculations in real estate. The demand for buildings was supported with low rate bank loans. The public authorities often supported this trend by easily issuing construction permits and granting tax breaks to homeowners (Fabrizi et al., 2015). Thereafter, the bursting of the property bubble led to the collapse of many construction companies. The entire sector was accused of being unsustainable because of its anti-

⁷ In Italy, local administrations traditionally governed by left-wing parties are considered more autocratic, less permeable to external interests, more legitimated to operate for the common good (*integrative model*, March and Olsen, 1989) or according to a hegemonic strategy (Gramsci, 2007). Right-wing councils of local administrations are considered to be more affected by external stakeholders, which are not only organised professional interests (*aggregative model*, March and Olsen, 1989) but also citizens' movements or local committees (*subsidiarity*, see Hill et al., 2008). According to Patrizia Messina (2001), the former local governments are usually more stable and able to realize important public infrastructures; the latter are more conditioned by variable coalitions of external interests and unable to contain the Nimby syndrome of small groups of citizens.

⁸ Personal communication of Fausto Pardolesi, *Agenzia Regionale per la Sicurezza del Territorio e Protezione Civile, Regione Emilia-Romagna, email 28 November 2016*.

⁹ Sources of information are various and variably combined in each case. "As a form of research, case study is defined by interest in individual cases, not by the [uniformity of] methods of inquiry used" (Johansson, 2003: 2). The three cases are complex functioning units of analysis, chosen for their emblematic and unique value: the Caldogno basin was the first DB project in Veneto region, the Senago project is a good example of land use conflict in metropolitan areas, the Ronco-Bidente project was indicated to me by the regional water security service as an example of good administration.

Table 1. Basic features of detention basin projects.

	Watershed/river (Region's name)		
	Seveso (Lombardy)	Bacchiglione-Timonchio (Veneto)	Ronco-Bidente (Emilia-Romagna)
Locality (municipality, Province)	Senago (Milan)	Caldogno (Vicenza)	Forlì e Forlimpopoli (Forlì-Cesena)
Basin capacity, extension number of containers or sectors	970,000 cubic metres, 11,5 ha, 3 sectors connected in sequence	3,800,000 cubic metres 105 ha, 2 sectors in sequence	10,000,000 cubic metres partitioned in 7 works on banks, 5 works of river qualification and expropriations, 5 DBs
Project direction (year project started)	Inter-regional Agency for the River Po (AIPO) plus a pool of engineering companies (2013)	Veneto Region Soil Defence Department with its civil engineering section plus an engineering company (2013)	Romagna Watershed civil engineering, a body of the Emilia- Romagna Region (2009)
Work total cost (euro) and fund sources	30 million; AIPO, Milan municipality, Metro Transport Company	40 million; Veneto Region and National Government	3.2 million for 14 works, entirely funded by National Government

Sources: Ronco-Bidente: Pardolesi and Sormani, 2011; Caldogno: BETA Studio srl, 2014; Senago: AIPO, 2013.

ecological construction methods and consumption of too much land for new buildings or works. Specifically, the hardest part of water security, based on banks strengthening and lining, was considered a waste of resources and useless for preventing floods.

In such a situation it makes sense to search for alternatives able to maintain the material and immaterial value of construction companies and to justify their presence in a new phase of water security based on risk management (Hartmann, 2011). Detention basins appear to be a good way to tackle the two issues: not to waste an important body of technical knowledge/tools on water infrastructure, and to deal with new challenges like climate change, weather vagaries, and criticism of the old model of flood protection.

The new market of detention basins is encouraging. The Veneto Region has planned about 16 new infrastructures of this kind, the Caldogno basin being a sort of trial. Region Emilia-Romagna is more advanced in the field because it has at least four basins already working¹⁰ and others are planned, even if with a variety of forms and functions. Lombardy too has numerous small detention basins envisaged or planned, especially upstream of the Milan metropolitan area.¹¹ The works for detention basins are

¹⁰ 'Casse di espansione' (another term for detention basins) on streams in Parma in Comune of Parma, Enza in Comune of Montecchio Emilia (RE), Secchia in Comune of Campogalliano (MO) and Panaro in Comune of San Cesario sul Panaro (MO), source: www.adbpo.it/on-multi/ADBPO/Home/verifichesismichedelleopereidrauliche/Cassadiespansione.html, visited 29 November 2016.

¹¹ "Estimates are ready: for the container of Lentate an all-inclusive investment of 15.6 million euros (9 for the works) has been calculated, while for Paderno and Varedo containers respectively 23.5 and 16.1 million are necessary. The grand total is 55.2 million" (author's translation; source: *Il Giorno* "Seveso, per le vasche di laminazione pioggia di milioni dal decreto Sblocca

expensive (see the costs in Table 1), highly engineered and seen as innovative – all ingredients for labelling them as a 'large scale construction' (*grande opera pubblica*) likely to receive wide recognition from politicians and public opinion.

This course of events shows the extraordinary capacity of the capitalist economy to re-structure its mission without losing value and maintaining legitimacy. The most subtle version of neoliberalism–control induced by responsibility given to private organizations – is apparently less pertinent to detention basins, because their functioning remains firmly in the hands of public bodies. However, citizen cooperation is required for other phases of flood risk, for example monitoring and preparedness.

The three detention basins analyzed drive traditional economic activities with well-rewarded public tenders benefitting both engineering and construction companies. In the field of the traditional economy, an important side-effect is the increased value of land assets. All three projects include private properties that have to be converted to a new use: temporary water containers.

In the Senago case the rural place where the containers are to be dug is entirely owned by a real estate company whose headquarters are in Milan. The chance to construct the DB is certainly advantageous for this company (higher rent or selling price) because the municipality of Senago had planned to maintain the plot's agricultural use, which provides a low income. In the Caldogno case, farmers owning land allocated to the DB construction had a chance to earn money from legal expropriation.

For the project on the Ronco-Bidente River the rent issue is more complex: many properties are involved. In one case there has been a deal between the company managing the nearby golf course and the municipality: the right to inundate part of the golf course in exchange for a permit to construct golf service buildings. In another case, the earth obtained from digging the containers was given to construction companies for free or sold on the market. Finally, the complex sequence of containers was a chance for farmers and industrial entrepreneurs owning the land to regenerate their activities, e.g. organic farming, decommissioning old productive structures, and permits to construct facilities for open air activities. These are all forms of development rights exchange (Micelli, 2002) which imply a good agreement among proprietors, the water security regional body, and municipalities.

2 – Policy community. The policy analysis approach to DB is mainly based on the balances internal to the public administration. The Senago project, to start with, is a case of inter-institutional conflict. To date (December 2016), the construction of the containers is blocked even though all authorizations have been obtained. Senago, a community of about 10,000 inhabitants, is located north-west of the Milan metropolis. It is one of the rare places that has contained urban sprawl and still has wide green areas. It was identified by AIPO as a good location for digging two containers in which to divert the Seveso river water when it is too abundant and risks flooding Milan. The reason for Senago municipality's fierce opposition to the project is that the area does not belong to the Seveso watershed. In fact, water from the river would reach the projected containers through an artificial channel (*Canale Scolmatore Nord Ovest*) connecting the Seveso and Ticino rivers. The local authority's objection is obvious: we have to offer our land for the benefit of others, especially for Milan, where the Seveso flows underground in a pipe! Furthermore, the Seveso River is highly polluted; besides sacrificing its own residual green land, Senago risks receiving from a neighbouring basin large quantities of dirty water during overflows.

The large coalition in favour of the project – de facto all the other public administrations, including the natural park – maintain that the best techniques to stop pollution will be used, and that the area of the containers will become a recreational place, without any cost to the Senago municipality.

Italia" 2 October 2014 www.ilgiorno.it/milano/cronaca/seveso-vasche-laminazione-1.264639. To be added are the project on Bresso and three DBs already built: one on Torrente Arno in Gallarate (VA) and two on Fiume Olona in Malnate and in San Vittore Olona (MI); www.adbpo.it/on-multi/ADBPO/Home/verifichesismichedelleopereidrauliche/Cassadiespansione.html.

Biodiversity will greatly increase as well. The last argument is very important because it is common to all the case studies and decisive for enlarging the number of supporters. It is a 'positive' argument to which environmentalists, natural park managers and recreational associations are sensitive. Green spaces in the outskirts of the Milan metropolis are very highly sought after.

But the main actors in this controversial project are not the environmental organizations. On the one side there is the Senago municipality, whose long-lasting opposition demonstrates the strength of local powers in Italy, and the complex framework regulating inter-institutional relationships (Bobbio, 2002). On the other side there is the Milan utility that manages surface and underground public transport. AIPO has prepared the project with high-level private engineering companies. These are the classic policy communities of public works: strong, closed, specialized, public-private mixed. Scholars would refer in this case to political disarticulation (Wickrama and Mulford, 1996; Manzungu and Derman, 2016), despite invitations to integration, and of competition between public bodies triggered by the introduction of New Public Management principles.

The Caldogno detention basin generated a lower level of conflict. From the outset, the municipality agreed with the regional administration, even though the two bodies were of opposite political colours. The only opposition was raised by the farmers owning the land to be used for the artificial basin. They were politically weak; some of them had rented the land to other farmers; nobody dwelt within the perimeter of the basin. Thus, the Veneto Region was able to overcome their resistance by imposing an inundation easement. This is a legal device existing in the juridical framework of only two Italian regions: Veneto and Tuscany. Its availability made it possible to reduce the costs of the detention basin. The alternative would have been legal expropriation, which is much more expensive for the regional administration. The provincial farmers' union played a strategic mediation role, showing what is typical of this region, i.e. the importance of interest groups in many public policies implementation (Messina, 2001).

Less evident in the Caldogno case is the role of civil engineers operating within the Department of Soil and Water Security of the Veneto Region. The private company that developed the project on behalf of the civil engineering body achieved much visibility by participating in public debates and making presentations on local television stations.¹² The policy community was similar to that in the previous case, but with a more prominent role for the regional politicians compared to regional civil engineers. The President of the Veneto Region personally followed progress of the works with frequent visits to the construction site.

In the Ronco-Bidente project, the policy community is denser but with a different array of actors. It includes the municipalities in which the works are to be undertaken (Forlì and Forlimpopoli), the local section of the regional civil engineering service, and a variety of entrepreneurial interests, but none of them with sufficient strength to seriously affect the solid inter-institutional alliance between public bodies of different levels and functions. These bodies plus the Province of Forlì-Cesena and the watershed authority signed a 'territorial agreement' for the project in 2012. Two new public organizations appear in this document: the Province is a body tasked with coordinating the municipalities. However, its importance is decreasing in the Italian institutional landscape; the regional watershed authority, created in Italy with the mentioned Law 183/1989, has the main task of drawing up a plan to balance water uses and prevent floods. Generally, the planning task of this body gives it less power in the water policy community than the civil engineering body, which prepares the

¹² A key issue is that these three cases were never reported by national media, differently from other large public works, like the high speed railway in Valle Susa or the Messina Bridge (Pellizzoni, 2011). There are several reasons, the most important of which is that (water) security is perceived as very important, while other public works are contested as symbols of injustice or capitalist exploitation (Lacey, 2005).

enforceable hydraulic works and manages the contracts with the private companies undertaking the material works.

3 – Policy network. In the Senago container project, civic participation has paradoxical aspects. On the Seveso River, whose overflowing waters should be sent outside the watershed (as explained earlier, Senago is located in another watershed) there is one of the most active experiences of civic participation: a 'river contract' (see footnote 2). In fact, the right name should be 'river pact', underlining a long-term and general agreement of the entire local society for sustainable management of the river. The Seveso River Contract organization was not able or did not want to intervene in the displacement of flood risk to an external area. On the other hand, the population living in Senago mobilized weakly against the project. Most of the opposition consisted of the municipality and a small committee animated by extreme left wing actors. This is a further reason for saying that conflict was mostly internal to the public institutions.

Citizen participation was also low in the Caldogno DB project. Environmental associations, specifically interviewed on the issue, showed that they were unaware of it or considered it not relevant to their mission and strategy. They were provincial-level associations based in Vicenza, the provincial capital affected by a disastrous flood of the Timonchio in 2010. Despite the high impact of the detention basin, those associations manifested weak involvement. Those more focused on nature protection were even favourable to the project because a small portion of the basin would be allocated to a wet area useful for environmental education. Furthermore, a ten-kilometre cycle path to a park in Vicenza could easily be created as an ecological corridor and an enjoyable amenity for citizens. Another association, Italia Nostra, more concerned with monuments and historic buildings, had an ongoing lawsuit with the Caldogno municipality for a housing project not at all connected to the detention basin. There is no evidence of other organized opposition to the DB project from the local civil society.

Some experts on primary activities, like agriculture and forestry, expressed dislike for the detention basin because they considered the infrastructure still based on the old philosophy of channelling and speeding up waters (Osti, 2016). The Caldogno basin has earthen banks, but its design (big, centralized, engineered) is too rigid to cope with rains which are unpredictable in terms of intensity and localization. This large-scale project fails to improve minor channels and ponds or to increase soil permeability. These experts, most of them working for the public administration, saw agroforestry and farmers' involvement as the best ways to handle high storm waters. For them, a widespread network of small ponds and enlarged trenches would function better in retarding water flows. They did not dissent openly because of their official position in the public administration. They preferred to propose alternative small projects without directly attacking the big detention basin idea.

The implicit mobilization of expertise was supported by Luigi D'Alpaos, a retired professor of Padua University, considered the main expert on hydraulic systems in the region. He argued that Caldogno DB was not wrong, but simply insufficient for the envisaged volumes of future rains to be drained. His half-support provided an argument for the above-mentioned experts on the primary sector: beside the DB, floodable areas have to be created together with a set of small hydraulic works in order to increase the capacity of the minor dikes network.

We can conclude that civic mobilization on DB did not come from ordinary people, through local committees or deliberative groups, or from environmental associations, but from members of the public administration induced not to protest because of their position as public officers. Nonetheless, this represents a two-fold split within the public sphere: one between civil engineers and local experts on the primary sector, the other between the latter and the politicians, all of whom openly supported the Caldogno project. The cross-party consensus on the DB explains its rapid realization, together with the above-mentioned use of flooding easement.

A situation of mild civic involvement emerged in the river Ronco-Bidente renovation project too. The difference concerns the participatory process organized by the municipalities of Forlì and Forlimpopoli.

The works were applauded by all civil society actors except one,¹³ who accused the authorities of having organized a new wave of urbanization of green areas under the flag of water security. In fact, the golf course accepted the proposal of flooding its lake in exchange for a permit to construct new buildings or enlarge the existing ones.

An implicit experts/politicians conflict cannot be reported in this case either. The broad consensus can also be explained by the capacity to involve civil society in the political realm, so well that we can imagine that Gramsci's hegemony has been fully realized in this region. There is a mix of ideological reasons with more material ones: a consensual vision of water security solutions is combined with enlarged exchanges¹⁴ of public administration with environmental and recreational associations (funds and legitimation of their activities), landowners (permit for construction and area regeneration), and national government (consensus exchanged against special funds for river security). The success of this project is also linked to the fact that it is articulated into various and relatively small interventions on unused containers, which are in the end more cost effective than a single new large basin (see Table 1).

CONCLUSIONS

Is there a return to hard supply-side water infrastructures? On the basis of the information presented on DBs projects in Northern Italy, the answer is only partially affirmative, and this for three reasons: a) DBs are softer infrastructures compared to the bank lining of the past, b) the actors governing the DBs projects are more or less the same, with little co-opting of planning experts. What has changed is the administrative level: DBs are negotiated, planned and implemented by subnational public bodies, c) a demand-side participatory bottom-up movement promoting widespread micro-actions of water flood prevention never started; there were many active river contracts but with very limited involvement in DB projects.

The question of the return to hard infrastructures has to be reformulated. DBs are an old answer to a new problem. There is no simple return to the past. The solution to climate change and the multiplication of extreme weather events is sought in the old 'flood protection' method: sealing of soils, precise boundaries for overflowing waters, limited interference with private property. The difference with the past, however, is the search for a multifunctional use of infrastructures, which also ensures an increase in biodiversity (small wetland zones) and open-air activities like hiking and biking. Multidimensional DBs are not only a pure opportunistic move, a way to increase consensus around a public work, but also a strategy for diversifying the land value.

Thus DBs represent a further rationalization of land use in three senses: concentration of the flood risk in a controlled confined area, further land consumption by new artefacts (sluices, pumps, barriers, roads, walls ...) (ISPRA, 2016), and a strategy to increase the low value of farmland. DBs fit in well with these three processes, which are substantially a continuation of the old policy using new instruments. These infrastructures are neither a return nor a radical change but a modest reform. Their similarities with the old policy of river/channel banks lining are evident: they are expensive grand-scale projects assigned based on the same socio-technical engineering packages. A break with the past is the inclusion of experts in biology and ecology for greening the infrastructure.

Nonetheless, the answer concerning continuity or discontinuity remains difficult because the processes observed are not uniform. The case of the Ronco-Bidente project, in which there is a mix of soft and hard measures, is an example of this. In Northern Italy, besides the planning of big containers,

¹³ He was a member of the Green Party; *source*: Comune di Forlimpopoli, Provincia Forlì-Cesena, Comune di Forlì, Regione Emilia-Romagna-Servizio Tecnico di Bacino 2014. Il fiume Ronco fra la via Emilia e Magliano, Ciclo di incontri (typewritten document without date).

¹⁴ On enlarged exchange of rural areas for ecosystem services see Osti (2012).

there have been numerous low-impact small-scale interventions. Therefore, a second reformulation of the initial question is: what provokes in some cases the construction of a large-scale project, and in others a softer and greener solution?

One possible answer comes from the morphology of the territory and the density of urbanization. These conditions are largely a legacy of the disordered development path of Northern Italy since the end of the Second World War. Given a huge amount of buildings, factories and infrastructures, it is not easy to return space to rivers and streams. Then, a precise siting and delimitation of containers appears to be the least bad solution, and is also less invasive of private real estate properties. In the face of forceful external conditions (urbanization, land ownership regime, public easements) the operating margins are very narrow and contingent, and so are the spatial-temporal windows of opportunity.

Another answer concerns the policy community of water security. We have shown that it is solid and slightly larger, because it includes experts of new disciplines. The planning methodology, however, has remained the same (see Moss, 2016). The plan is the central instrument around which to organize participation, cultural heritage appreciation, multifunctional water use. Even risks and actions during emergencies have to be translated into a plan, according to the EU Directive on the assessment and management of flood risks.

Whilst the 'policy community' is no longer hegemonic, it has not become a 'network' as imagined in the literature on governance. This approach has therefore yielded less insight than expected, as found in other case studies (Hernández-Mora et al., 2015). The solutions for water security remain within the remit of a plan. And the plan is the exclusive matter of some disciplines. Lay people have access to it only through external ex post remarks. In such a rigid framework the room for manoeuvre for bottom-up action, like dikes and ponds enlargement, is very small. This kind of action requires an immense work of negotiation between local politicians and landowners, expensive compensations for land loss and buildings demolition, and then new taxes for citizens ignorant of the reasons for such policy.

Insistence on the centrality of the plan and on related disciplines recalls some interpretations of the governmentality framework. Planning is an instrument to control a territory at a distance; control comes about through plan rationality, that is, a set of coherent and useful land use assignments. Some credit must therefore be given to the critics of neoliberalism, both in terms of the permanence of old interest groups in water security works and in terms of hierarchies of knowledge devices.

This is a bitter conclusion: governmentality and the persistence of a policy community are signals of low-quality democracy. Is water participation therefore impossible? It depends on the extent to which DB projects 'act' as motivators. Strong opposition in the Senago case has stimulated a counter-project in the nearby municipality of Bollate. "More than one million euro to restore the minor hydraulic network largely projected and constructed in the Middle Ages, intended to drain overflows and reduce aquifer rise".¹⁵ In this project there is still an 'old bottle' – a potable water utility, a land reclamation consortium and the Agriculture Faculty of Milan University – but filled with an 'old wine' – minor medieval channels. Together with the small group of agroforestry experts in Vicenza Province and the mixed solutions adopted in the Ronco-Bidente project, these examples show that the return to heavy infrastructures can be moderate.

¹⁵ Gruppo CAP e Consorzio Est Ticino Villoresi insieme per il recupero dei canali contro il rischio idrogeologico, Press release, Milan, 27 November 2015; www.gruppocap.it/FileFolder/c4337907-c08e-4155-b548-245d23322578/File/Il%20Gruppo/Comunicazione%20E%20Media/Comunicati%20Stampa/CS_Villoresi.docx (accessed 16 November 2016)

REFERENCES

- AIPO, 2013. *Vasca di laminazione sul fiume Seveso*. Comune di Senago (MI) MI-E-789, Progetto Preliminare, Relazione Illustrativa. Milan, Italy, April.
www.cartografia.regione.lombardia.it/silvia/ReadFile?idFile=52985223&nomeFile=SIA.pdf&estensione=.pdf
 (accessed 16 November 2016)
- Amin, A. 2014. Lively infrastructure theory. *Culture & Society* 31(7/8): 137-161.
- Arnouts, R. and Arts, B. 2009. Environmental governance failure: The 'dark side' of an essentially optimistic concept. In Arts, B. et al. (Eds), *The disoriented state: Shifts in governmentality, territoriality and governance*, pp. 201-228. Dordrecht, The Netherlands: Springer.
- Bäckstrand, K. 2003. Civic science for sustainability: Reframing the role of experts, policy-makers and citizens in environmental governance. *Global Environmental Politics* 3(4): 24-41.
- Bakker, J.I. 2015. Conclusions. In Bakker J.I. (Ed), *The methodology of political economy: Studying the global rural-urban matrix*, pp. 211-256. Lahnam, USA: Lexington Books.
- Bauer, C.J. 1997. Bringing water markets down to earth: The political economy of water rights in Chile, 1976-95. *World Development* 25(5): 639-656.
- Baumgartner, F. and Jones B. 1993. *Agendas and instability in American politics*. Chicago, USA: University of Chicago Press.
- BETA Studio srl 2014. Interventi per la sicurezza idraulica dell'area metropolitana di Vicenza: area di laminazione del torrente Timonchio. Ponte San Nicolò, Padova, Italy;
<http://repository.regione.veneto.it/public/cc767edcf7f83fc0679189c82d9e81f5.php?lang=it&dl=true>
 (accessed 8 December 2016)
- Bichsel, C. 2016. Water and the (infra-)structure of political rule: A synthesis. *Water Alternatives* 9(2): 356-372.
- Bobbio, L. 2002. *I governi locali nelle democrazie contemporanee*. Bari-Rome, Italy: Editori Laterza.
- Boussaguet, L. 2016. Participatory mechanisms as symbolic policy instruments? *Comparative European Politics* 14(1): 107-124.
- Broekmans, B. and Ruijgh-van der Ploeg, T. 2012. Experts and expertise in the governance of infrastructures: Flood-risk management as an example. *Halduskultuur – Administrative Culture* 13(1): 20-38.
- Bruzzo, S. 2013. Climate change and reorganizing land use: Flood control areas as a network effect. *International Journal of Urban and Regional Research* 37(6): 2001-2013.
- Burnham, M.; Ma, Z.; Endter-Wada, J. and Bardsley, T. 2016. Water management decision making in the face of multiple forms of uncertainty and risk. *Journal of the American Water Resources Association*. DOI: 10.1111/1752-1688.12459
- Candace, J.; Hesterly, W.S. and Borgatti, S.P. 1997. A general theory of network governance: Exchange conditions and social mechanisms. *The Academy of Management Review* 22(4): 911-945.
- Castellari, S. and Artale V. (Eds). 2010. *I cambiamenti climatici in Italia*. Bologna, Italy: Bononia University Press.
- De Boeck, F. 2012. *Infrastructure: Commentary from Filip De Boeck*. Curated Collections. Cultural Anthropology website, 26 November 2012,
https://culanth.org/curated_collections/11-infrastructure/discussions/7-infrastructure-commentary-from-filip-de-boeck
- DeKeles, J. 2015. Water and wastewater, smart cities. *Readiness Guide*.
<http://readinessguide.smartcitiescouncil.com> (accessed 2 April 2017)
- Del Moral, L. 2009. Changing water discourses in a modern society. In Garrido, A. and Llamas, R.M. (Eds), *Water Policy in Spain*, pp. 85-39. Boca Raton, USA: CRC Press.
- Diamanti, I. 1995. *La lega, geografia, storia e sociologia di un soggetto politico*. Rome, Italy: Donzelli.
- Easton, D. 1953. *The political system*. New York, USA: Knopf.
- Fabrizi, C.; Pico, R.; Casolaro, L.; Graziano, M.; Manzoli, E.; Soncin, S.; Esposito, L.; Saporito, G. and Sodano, T. 2015. *Mercato immobiliare, imprese della filiera e credito: una valutazione degli effetti della lunga recessione*, Occasional Papers No. 263. Rome, Italy: Banca d'Italia.

- Fresque-Baxter, J. and Kelly, E. 2017. Going to the well: Water as a community builder. In Devlaeminck D.; Adeel, Z. and Sandford, R. (Eds), *The human face of water security*, pp. 173-196. Cham, Switzerland: Springer.
- Goria, A. and Lugaresi, N. 2002. *The evolution of the national water regime in Italy*. EUWARENESS, University of Twente, The Netherlands.
- Gramsci, A. 2007. *Quaderni del carcere*. A cura di V. Gerratana, 4 vol., Torino, Italy: Einaudi.
- Gusmaroli, G. 2013. *Censimento nazionale delle esperienze di Contratto di Fiume: Stato dell'arte e riflessioni*. VIII Tavolo Nazionale dei Contratti di Fiume, Florence, Italy, 9 December 2013.
- Haeuber, R. 1996. Setting the environmental policy agenda: The case of ecosystem management. *Natural Resources Journal* 36(1): 1-27.
- Harris, D.; Kooy, M. and Jones, L. 2011. *Analysing the governance and political economy of water and sanitation service delivery*. Working Paper No. 334; London, UK: Overseas Development Institute.
- Hartmann, T. 2011. *Clumsy floodplains: Responsive land policy for extreme floods*. Farnham, UK: Ashgate.
- Harvey, D. 2004. The 'new' imperialism: Accumulation by dispossession. *Socialist Register* 40: 63-87.
- Hernández-Mora, N.; Cabello, V.; De Stefano, L. and Del Moral, L. 2015. Networked water citizen organisations in Spain: Potential for transformation of existing power structures in water management. *Water Alternatives* 8(2): 99-124.
- Hill, C.; Furlong, K.; Bakker, K. and Cohen, A. 2008. Harmonization versus subsidiarity in water governance: A review of water governance and legislation in the Canadian Provinces and Territories. *Canadian Water Resources. Journal/Revue canadienne des ressources hydriques* 33(4): 315-332.
- ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale). 2015. *Soil consumption in Italy*. Rome, Italy.
- Johansson, R. 2003. *Case study methodology*. International Conference "Methodologies in Housing Research" organized by the Royal Institute of Technology in cooperation with the International Association of People-Environment Studies, Stockholm, Sweden, 22-24 September 2003.
- Jones, S.D. 2015. Bridging political economy analysis and critical institutionalism: An approach to help analyse institutional change for rural water services. *International Journal of the Commons* 9(1): 65-86.
- Lacey, A. 2005. Spaces of justice: The social divine of global anti-capital activists' sites of resistance. *Canadian Review of Sociology/Revue canadienne de sociologie* 42(4): 403-420.
- Larkin, B. 2013. The politics and poetics of infrastructure. *The Annual Review of Anthropology* 42(1): 327-43.
- Loughlin, J. 2001. *Subnational democracy in the European Union: Challenges and opportunities*. Oxford, UK: Oxford University Press.
- Manzungu, E. and Derman, B. 2016. Surges and ebbs: National politics and international influence in the formulation and implementation of IWRM in Zimbabwe. *Water Alternatives* 9(3): 493-512.
- March, J.G. and Olsen, J.P., 1989. *Rediscovering the institutions. The organisational basis of politics*. New York, USA: The Free Press.
- Martin, B. 2007. Activism, social and political. In Anderson, G.L. and Herr, K.G. (Eds), *Encyclopedia of activism and social justice*, pp. 19-27. Thousand Oaks, USA: Sage.
- Meijerink, S. 2005. Understanding policy stability and change. The interplay of advocacy coalitions and epistemic communities, windows of opportunity, and Dutch coastal flooding policy 1945-2003. *Journal of European Public Policy* 12(6): 1060-1077.
- Meijerink, S. and Huitema D. 2010. Policy entrepreneurs and change strategies: Lessons from sixteen case studies of water transitions around the globe. *Ecology and Society* 15(2): 21, www.ecologyandsociety.org/vol15/iss2/art21/
- Messina, P. 2001. *Regolazione politica dello sviluppo locale. Veneto ed Emilia-Romagna a confronto*. Torino, Italy: Utet.
- Micelli, E. 2002. Development rights markets to manage urban plans in Italy. *Urban Studies* 39(1): 141-154.
- Monteleone, R. 2007. Introduzione. In Monteleone, R. (Ed), *La contrattualizzazione nelle politiche sociali: forme ed effetti*, pp. 1-16, Rome, Italy: Officina.
- Moss, T. 2016. Conserving water and preserving infrastructures between dictatorship and democracy in Berlin. *Water Alternatives* 9(2): 250-271.

- Osti, G. 2012. Wind energy exchanges and rural development in Italy. In Sjöblom, S.; Andersson, K.; Marsden, T. and Skerratt, S. (Eds), *Sustainability and short-term policies. Improving governance in spatial policy interventions*, pp. 245-259. Aldershot. UK: Ashgate.
- Osti, G. 2016. *Storage and scarcity. New practices for food, energy and water*. London and New York: Routledge.
- Palmer, M.A.; Liu, J.; Matthews, J.H.; Mumba, M. and D'Odorico, P. 2015. Water security: Gray or green? *Science* 349(6248): 584-585.
- Pardolesi, F. and Sormani, D. 2011. *Fiume Ronco – Bidente. "Sistemazione e riqualificazione fluviale con opere di laminazione delle piene del tratto ponte via Emilia-Magliano. Integrazione alla relazione tecnica*. Forlì, Italy: Servizio Tecnico di Bacino Romagna, Regione Emilia-Romagna. <http://ambiente.regione.emilia-romagna.it/suolo-bacino/servizi/gare-e-appalti-pubblici/gare-e-appalti-pubblici-1/servizio-tecnico-bacino-romagna/allegati-procedure-negoziare-e-di-cottimo-fiduciario/fiume-ronco-2r7f002-adequamento-sezioni-7h1f011-manutenzione-idraulica/1-a-ronco-relazione-paesaggistica-ronco-2-golf> (accessed 18 November 2016)
- Pellizzoni L. (Ed). 2011. *Conflitti ambientali. Esperti, politica, istituzioni nelle controversie ecologiche*. Bologna, Italy: Il mulino.
- Pellizzoni, L. 2015. *Ontological politics in a disposable world. The new mastery of nature*. London, New York: Ashgate-Routledge.
- Potter, C.A. and Wolf, S.A. 2014. Payments for ecosystem services in relation to US and UK agri-environmental policy: Disruptive neoliberal innovation or hybrid policy adaptation? *Agriculture and Human Values* 31(3): 397-408.
- Putnam, R.D., with Leonardi, R. and Nanetti, R.Y. 1994. *Making democracy work: Civic traditions in modern Italy*, Princeton, USA: Princeton University Press.
- Rainaldi, F. 2010. Il governo delle acque in Italia e Inghilterra. Un'analisi del policy change. PhD Dissertation. Università di Bologna, Italy.
- Swatuk, L.A. 2008. A political economy of water in Southern Africa. *Water Alternatives* 1(1): 24-47.
- Swyngedouw, E. 2005. Governance innovation and the citizen: The Janus face of governance-beyond-the-state. *Urban Studies* 42(11): 1992-2006.
- Swyngedouw, E. 2009. The political economy and political ecology of the hydro-social cycle. *Journal of Contemporary Water Research & Education* 142(1): 56-60.
- Terlouw, K. 2014. Iconic site development and legitimating policies: The changing role of water in Dutch identity discourses. *Geoforum* 57: 30-39.
- Voghera, A. 2015. *River contracts in Italy. An experience for river management*. In Proceedings of the Conference Energy, Environment, Development and Economics, pp. 351-362. Zakynthos Island, Greece, July 16-20 2015.
- Warner, J.; Lulofs, K. and Bressers, H. 2010. The fine art of boundary spanning: Making space for water in the East Netherlands. *Water Alternatives* 3(1): 137-153.
- Warner, J.; Wester, P. and Bolding, A. 2008. Going with the flow: River basins as the natural units for water management? *Water Policy* 10(S2): 121-138.
- Weible, C.M. 2008. Expert-based information and policy subsystems: A review and synthesis. *The Policy Studies Journal* 36(4): 615-635.
- Wickrama, K.A.S. and Mulford, C.L. 1996. Political democracy, economic development, disarticulation and social well-being in developing countries. *The Sociological Quarterly* 37(3): 375-390.
- Zevenbergen, C.; Veerbeek, W.; Gersonius, B. and van Herk, S. 2008. Challenges in urban flood management: Travelling across spatial and temporal scales. *Journal of Flood Risk Management* 1(2): 81-88.

