Resilient Governance for Resilient Cities – Assessing the Governance Context for Green Infrastructure Implementation in Hoboken

Leonie Staas, University of Twente

KEYWORDS

Resilience; flood risk management; governance assessment; green infrastructure; implementation

ABBREVIATIONS

BMP	Best management practices manual
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Administration (FEMA)
GAT	Governance Assessment Tool
GI	Green infrastructure
NGO	Non-governmental organization
NJDEP	New Jersey Department of Environmental Protection
RBD	Rebuild by Design strategy
SWM	Stormwater management rules
UNISDR	United Nations Office for Disaster Risk Reduction

ABSTRACT

The question of flood resilience in the context of urban growth and climate change has turned the ability to adapt to and recover from flood disasters into a necessary asset for coastal cities like Hoboken. When hurricane Sandy hit Hoboken in October 2012, the social and economic loss was unprecedented. Hence, the city reacted with ambitious plans to install green infrastructure as a measure towards flood resilience, including the 'Green Infrastructure Strategic Plan' and the 'Resist, Delay, Store, Discharge' strategy under Rebuild by Design. A successful implementation of the green infrastructure measures proposed can be considered a necessary condition for increased flood resilience in Hoboken. This paper examines the supportiveness of the city's wider governance context on the implementation process. A governance assessment tool is applied to evaluate the characteristics of the governance regime. The methodology combines documentary analysis with in-depth stakeholder interviews.

1   INTRODUCTION

Flash floods have the potential to severely disrupt critical systems of a city. According to the 2014 National Climate Assessment, extremely heavy precipitation events have increased since 1958 by 71 % in the Northeast of the US, where Hoboken is located (Hoboken, 2017). As a consequence of

climate change, flood-prone areas are expected to expand a shocking 100 percent around the Gulf of Mexico and the Atlantic coastline by 2100 (Postal, 2013). More than 13 million people in the US alone will be exposed to life-threatening floods by the end of this century, therefore depending decisively on competent disaster prevention and management (Lavelle, 2016).

The low-lying areas of Hoboken, some of which are located less than three feet above sea level, are designated by the Federal Emergency Management Administration (FEMA) as a High Flood Risk zone (Bailin, 2014). Hence, increased flood exposure in Hoboken needs to be coupled with enhanced flood adaptation and mitigation to reduce losses and damage. The world's cities, among them Hoboken, need to become more resilient.

One way to increase urban resilience to flooding is to install green infrastructure (GI) measures in affected areas in order to absorb heavy downpours and reduce stormwater runoff. Such GI measures include parklands, constructed wetlands, basins, ponds, rain gardens, stormwater trees, subsurface storage or green roofs. The implementation of GI has a huge potential in building resilience through protecting floodplains. According to the United States Environmental Protection Agency (EPA), green infrastructure can potentially reduce stormwater runoff volumes by 99 percent (EPA, 2017). Through the absorption of rainfall and preventing water from overwhelming sewer systems, the implementation of GI measures can save millions of dollars in flood losses while protecting human security for relatively low costs (EPA, 2017). However, the success of such measures is not only dependent on their theoretical ability to absorb a sufficient amount of water from a technical perspective, but also on their efficient and adequate implementation in practice.

Long before Sandy, when the 'City of Hoboken Masterplan' (2004) was adopted, GI was already set as a desirable goal for the city that is characterized by impenetrable surfaces. After Sandy, in 2013, the city introduced its 'Green Infrastructure Strategic Plan' (Together North Jersey, 2013). The plan sets out ambitious goals regarding the implementation of different GI measures all around the city during the coming years. When Hoboken entered the Rebuild by Design competition, launched by the United States Department of Housing and Urban Development in 2014, the city incorporated the Green Infrastructure Strategic Plan in their proposal. The result was a comprehensive water management strategy, combining traditional measures like grey infrastructure and non-traditional approaches like GI in a multi-facetted approach.

The city's efforts paid off: the RBD strategy was awarded as one of six winning concepts. The federal government invested intensively in the strategy, granting $230 million, by far the highest amount among all winning projects, for the implementation of the plan. Moreover, as part of their 'Making Cities Resilient' Campaign, the United Nations Office for Disaster Risk Reduction (UNISDR) has designated Hoboken as a Role Model City for Resilience Planning. This image of Hoboken as a best practice role model for urban flood resilience makes it an interesting case to study the city's governance context for GI implementation.

Most of Hoboken's resilience strategy regarding GI up to now has just been 'talks and plans' – plans that have gained much international recognition. The fact that most measures still wait to actually become implemented however makes an examination of the governance context that determines the success or failure of its implementation highly interesting and relevant.

2   METHODS

A central assumption underlying this study is the crucial relevance of the wider governance contexts for the successful implementation of certain policies and programs. The application of the GAT starts from the premise that 'complex and dynamic multi-actor interaction processes […] require a good governance context to enable the realization of practice projects' (Bressers et al., 2016: 45). The key theoretical framework that is applied in this study is the 'Governance Assessment Tool', or

GAT (Bressers, Browne, & al., 2015). The GAT has built a complete model that acknowledges the wealth of aspects that have been brought to light by policy scientists. Synthesizing various academic approaches to governance as elaborated on in section 2.1, Bressers and Kuks (2003) developed a 'governance pattern' characterized by the following five dimensions of governance systems:

1. Levels and scales refer to the relation between the administrative levels of government involved in conducting a policy as well as other types of spatial scales, such as hydrological levels; it addresses which levels dominate the process and how the interactions take place.

2. Actors and networks take into account the multi-actor feature of governance beyond government and addresses the ways the actors are involved, whether and how they establish networks, or what their accepted roles are.

3. Problem perceptions and goal ambitions refer to the actors' perceptions of reality, how serious they see the problem or which preferences they see at stake.

4. Strategies and instruments recognize that in each governance context, there will be multiple ways and instruments to reach a goal, and addresses the strategies employed, the target groups of that strategy and the requirements of instruments.

5. Responsibilities and resources address the issues of which organizations are responsible for implementation, what authority these organizations possess or what resources are available to them.

For the GAT, Bressers et. al. (2016) identified four 'quality criteria' along which the dimensions of governance can be assessed:

1. Extent refers to the completeness of the regime: 'are all elements in the five dimensions that are relevant for the sector or project that is focused on taken into account?' (H. Bressers et al., 2016).

2. Coherence relates to interrelationship and interactions within and between the five dimensions: 'are the elements in the dimensions of governance reinforcing rather than contradicting each other?' (Bressers et al., 2016).

3. Flexibility addresses the importance of 'adaptive implementation', asking whether 'multiple roads to the goals, depending on opportunities and threats as they arise, are permitted and supported' (Bressers et al., 2016). This criterium acknowledges the reality of modern policy-making, full of unexpected obstacles as well as unprompted windows of opportunity that can contribute significantly to the success or failure of a project.

4. Intensity focuses on the issue of how deeply involved the project at stake is within the problem perceptions, goals, resources, etc., asking 'how strongly do the elements in the dimensions of governance urge changes in the status quo or in current developments' (Bressers et al., 2016).

By organizing the analysis along five dimensions and four criteria of governance, every governance setting can be described comprehensively for a certain policy or program in a given place and time.

A total of twelve individuals, representing nine different organizations or institutions, were selected as the subjects of the study and interviewed as key informants. The inclusion criteria employed ensured that, firstly, all relevant types of stakeholders, including their diverse perspectives on the process of GI implementation, have been taken into account, and secondly, that only individuals with sufficient experience in their position within the respective organization have been addressed. The types of organizations involved in the study included a) governmental institutions from

different levels, b) civil society organizations and community boards, c) research institutes and independent consultancies, d) enterprises from construction, development and engineering, e) architecture firms and f) media institutions.

Parameters for each cell of the GAT matrix (see Table 1) are operationalized, 'rating' and assigning 'values' to the four quality criteria of governance along a three-point scale: low, moderate and high. Moderate and high values indicate supportiveness for the implementation of green infrastructure, while low degrees of supportiveness can be regarded equivalent to 'restrictive' conditions for successful implementation.

A visualization of the overall governance quality creates a quick glance on whether the governance context is supportive, restrictive or neutral for successful green infrastructure implementation. Moreover, it allows a comparison amongst cases.

3   RESULTS

After a systematic assessment of each governance dimension and quality, predictions can be made about the likelihood of successful implementation of green infrastructure in Hoboken.

Extent was assessed as high, and therefore supportive of green infrastructure implementation. No levels of government are excluded from the process. Moreover, two governmental bodies take the lead within the process, namely the municipality of Hoboken and NJDEP. When it comes to actors and networks beyond government, the process of green infrastructure implementation is generally perceived as very inclusive. The high inclusiveness of the process to non-governmental actors shapes the actors' cognitions of their role within the reality of green infrastructure implementation in a way that encourages successful implementation. Minor drawbacks in extent stem from the fact that the private business community is not yet involved sufficiently. However, the municipality is aware of its potential for supporting implementation and tries to improve outreach to private companies and insurances. The majority of problem perceptions is taken into account during implementation, including problems related to resource allocation, operation and maintenance and privately owned land. However, the city's plans regarding green infrastructure are not always aware of the actual site constraints that developers and architects are facing. The range of instruments of green infrastructure as well as the number of innovative strategies for their implementation is very high. Such strategies include enforcement measures like the use of eminent domain or strategic partnerships. Responsibilities between all stakeholders, including both governmental and non-governmental actors, are clearly assigned and facilitated with resources. This affects the actors' power relations in a way that is supportive for successful implementation of green infrastructure.

Coherence was assessed low to moderate, and therefore only partly supportive of a successful green infrastructure implementation. The lack of integration among local, regional and state entities is cited as a 'major stumbling block to designing and implementing green infrastructure projects' by NGOs (Worstell, 2013). The need for numerous approvals, longer approval times and uncertainty in procedures, among others, discourage implementation. While collaboration among NGOs and research institutes is extraordinarily strong, developers, builders and engineers are not trusted in their approach towards green infrastructure. Moreover, community boards do not feel sufficiently heard by the government. Developers and engineers frequently face numerous site constraints and regulatory barriers that they do not feel sufficiently considered in the plans. This leads to trade-offs in instruments actually considered for implementation. Even though the assigned responsibilities are partly overlapping between different governmental institutions and divisions (especially on the state level), the system is generally perceived as legitimate by all relevant stakeholders. Coherence in responsibilities and resources has therefore been assessed as moderate, thus supportive for implementation.

Flexibility strongly differs among the different dimensions of governance. It was assessed as highly supportive in terms of actors and networks, problem perceptions and goal ambitions as well as responsibilities as resources. There is a high potential to include non-traditional and new actors in the process of green infrastructure implementation. Especially the private business community, including real estate, insurance industry and small- and medium-sized enterprises, could potentially contribute powerful social capital in order to support the task of green infrastructure implementation. Other actors in the arena are therefore increasingly targeting this stakeholder group. The implementation of green infrastructure can optimize multiple and very diverse goals at the same time, ranging from educating the public or gaining electoral benefits to tackling other climate related issues such as urban heat. As the actors' motivations are determined by their goals and ambitions, the fact that many of the actors' goals can be optimized through green infrastructure simultaneously spurs them into action. When it comes to possibilities to pool resources from different sources, the municipality of Hoboken possesses an impressive leeway. However, flexibility was assessed as low and thus restrictive for successful green infrastructure implementation when it comes to levels and scales as well as strategies and instruments. There is no degree for adaptation for the levels included given the current regulatory framework. The choice of different types of instruments for the few available construction sites in Hoboken is extremely limited. This is due to multiple site constraints as well as the small leeway for the city in terms of time.

Intensity has been assessed as moderate or high and therefore supportive for green infrastructure implementation, except for responsibilities and resources, which are highly restrictive. The impact for behavioural change highly differs between the two most important levels: the state and the municipality. The weak impulse on the state level is counterbalanced by the municipality's forceful impact for implementation, pushed forward by strong and courageous leadership of Hoboken's Mayor Dawn Zimmer. A high number of actors involved, including NGOs, civil society organizations, research institutes and media houses push very strongly for green infrastructure implementation through convening the different actors in the arena, promoting information-sharing and educating the public. Both the goal of green infrastructure implementation as a measure of flood mitigation as well as the instruments required for such action strongly deviate from former practice and the status quo. Globally, but also on a regional level, the majority of stakeholders has deplored a lack of resilience-based thinking in all levels of society. Rather, a mentality of disaster risk management instead of disaster risk reduction, associated with a 'just-rebuild-it' -mentality has been prevailing. The highly deviating nature of green infrastructure from business as usual potentially affects the actors' motivations in a way that discourages green infrastructure implementation. Despite supportive degrees of intensity for most governance dimensions, responsibilities and resources have been assessed as highly restrictive for successful green infrastructure implementation. The insufficiency of resources for implementation as intended was consistently emphasized as the primary impediment, which is very difficult for the municipality to overcome. The solution to the funding problem requires a lot of individual responses to a lot of individual circumstances, creating planning uncertainty for the implementation of green infrastructure.

Upward trends have become apparent in coherence and intensity of different levels of government. Interviewees from all types of organizations have emphasized the 'emerging' nature of the topic of green infrastructure. In fact, a global tendency towards sustainability practices, of which green infrastructure is an important part, is reflected in Hoboken's local policy-making procedures. Non-profit organizations have indicated: 'if we would be having this interview in two or three years, it would all look a lot different. I think it's promising and I'm very optimistic'. The study took place in a time of paradigm shift on global, national and regional level. Even though awareness of the value and potential of green infrastructure might still be low on state level or among residents, NGOs and research institutes expressed their optimism in the future of green infrastructure. Unsupportive conditions of the regulatory framework might be adapted and disincentives might be wiped out in the

coming years. Moreover, non-traditional actors like real estate firms and insurances are becoming increasingly integrated in the process of green infrastructure implementation.

Downward trends are anticipated by numerous stakeholders regarding flexibility and intensity of resources for green infrastructure implementation. This is due to the disruptive potential of government elections and the ideological shift away from resilience-based thinking within the Trump administration on federal level. Table 3 below summarizes these findings per governance dimension and quality criterion.

Governance Dimension	Extent	Coherence	Flexibility	Intensity
Levels & Scales	High	Low ⬆	Low	Moderate ⬆
Actors & Networks	High ⬆	Moderate	High	High
Problem Perceptions & Goal Ambitions	Moderate	Low	High	Moderate
Strategies & Instruments	High	Moderate	Low	Moderate
Responsibilities & Resources	High	Moderate	High ⬇	Low ⬇
Assessed as:	High Supportive	Low/Moderate Partly Supportive	High to Low	Mostly Supportive

Conclusions

This thesis assessed the degree to which the governance context in Hoboken is supportive or restrictive for successful implementation of green infrastructure, a measure adopted towards flood resilience.

As Table 2 shows, the majority of dimensions and quality criteria of governance are supportive towards a successful implementation of green infrastructure in Hoboken. In particular, the high degrees to which different governmental levels as well as non-governmental actors are involved in the process as well as the high extent to which different strategies and instruments for implementation are taken into account increase the likelihood of success. Moreover, there is a very high flexibility to achieve multiple stakeholder goals at the same time, to include non-traditional actors in the process and to allocate alternative funding sources, positively impacting the likelihood of implementation success. The clear distribution of resources as well as the strong impact for implementation from civil society organizations and research institutes further increase the likelihood of successful implementation of Hoboken's green infrastructure plans.

However, five factors strongly reduce the likelihood of successful implementation of green infrastructure. Firstly, there is a lack of coherence between municipal and state regulations, confusing and discouraging stakeholders to use green infrastructure ambitiously. Secondly, an insufficient coordination of municipal problem perceptions with those of developers and engineers functions as

highly restrictive for successful implementation of green infrastructure. Thirdly, the problems faced by developers and engineers during the process are not always taken into account by governmental bodies when drafting the plans. Fourthly, regulatory barriers and site constraints limit the flexibility of instruments so decisively that the restrictive impact on implementation success is strong. Lastly, the insufficiency of financial resources for the municipality strongly restricts the likelihood of implementation of green infrastructure.

Based on these results, the assumption that 'being a city that is considered as best practice for urban resilience, Hoboken has a governance context that is highly supportive of the implementation of green infrastructure' could not be fully confirmed. Even though the majority of dimensions and quality criteria is supportive of green infrastructure implementation, decisive elements of the governance context have the potential to severely impede the process. In order to overcome these impediments, three main recommendations can be made to practitioners, reflecting upon what barriers and hindrances in the governance context they should address.

Firstly, the outreach to developers and engineers needs to be intensified in order to increase awareness about the cost-benefits as well as the potential of green infrastructure as a stormwater management tool. This can be achieved through more case studies, resolving misconceptions and misunderstandings associated to green infrastructure and showing examples of where and how well it has worked before.

Secondly, the overall regulatory framework for green infrastructure implementation needs to be adapted in order eliminate disincentives for developers and push for an ambitious use of green infrastructure. In the current state, regulatory impediments and the associated permitting processes are agreed upon by all stakeholders as one of the major impediments to green infrastructure implementation. A lack of guidance in state regulations needs to be replaced through a clear and transparent set of rules. In particular, the vague language in the SWM Rules as well as the BMP manual need to be replaced through objective and possibly even mandatory standards for implementation. Green infrastructure needs to be more determinedly credited as an effective tool for stormwater management in laws and regulations.

Thirdly, the social aspect of resilience needs to be addressed much more deliberately. In particular, a stronger engagement of young people and families with children can contribute to the sustainability of green infrastructure measures by addressing the problem of maintenance and operation. Social capacity needs to be increased by including those who are going to be the operators and taxpayers in the future on an early stage of the process. A sustainable approach to green infrastructure requires an alignment of values and priorities. Therefore, resilience-based governance needs to be fostered by comprehensive social inclusion. This way, the community and its institutions, such as research institutes, will function as a safeguard for resilience and the continuity of green infrastructure implementation in the future.

Reflecting on the theory employed, this study has shown that the GAT can be applied in a predictive manner and is useful to provide valuable insights into the likely future of an implementation process. This finding can be generalized to applications of the GAT for other policy-areas beyond water management. However, it was found that construct validity in terms of a strong interconnectivity between the concepts is a serious shortcoming of the theory. As described in Section 3.4, the leading questions of the GAT (Table 1) were employed to assign information to the concepts and thus to the matrix cells. However, several of the dimensions as well as quality criteria of the GAT framework have shown to affect each other in mutual ways. For example, the coherence between the different instruments of green infrastructure increase flexibility of strategies, while at the same time, certain problem perceptions limit flexibility. Future theory development of the GAT should focus on redefining the concepts and formulating leading questions that separate the different dimensions and criteria more precisely.

Further limitations to the validity of results may arise from the fact that confounding variables not included in the GAT may also affect the likelihood of successful implementation of green infrastructure in Hoboken. Such a confounding variable might be the wider geographical and socio-economic context of the city, given 40

the fact that Hoboken is a transit-hub and its resilience economically and infrastructurally crucial for nearby New York City. Future research should explore the effect that wider contextual factors outside of the GAT's operationalization have on motivations, cognitions and resources of actors and thus on the likelihood of successful green infrastructure implementation.

Resilient cities require resilient governance. Through a predictive application of the GAT, this paper has addressed the need for concrete, context-specific knowledge on how to redesign Hoboken's governance structures for more successful implementation of green infrastructure as a measure towards becoming a more resilient city.

References

100ResilientCities. "Defining Urban Resilience." Retrieved June 15, 2017, from http://www.100resilientcities.org/#/-_/.

Agyepong, I. A. and S. Adjei (2008). "Public social policy development and implementation: a case study of the Ghana National Health Insurance scheme." Health Policy and Planning 23(2): 150-160.

Bailin, D. (2014). "Hoboken's Post-Sandy Resilience - Learning from the Past, Rebuilding for the Future " Union of concerned scientists.

Bellamy, J. and A. Brown (2013). Federalism and Regionalism in Australia: New Approaches, New Institutions?, ANU Press.

Bingham, L. B., et al. (2005). "The new governance: Practices and processes for stakeholder and citizen participation in the work of government." Public administration review 65(5): 547-558.

Birkland, T. A. (2014). An introduction to the policy process: Theories, concepts and models of public policy making, Routledge.

Blomquist, W. and E. Schlager (1999). Watershed management from the ground up: Political science and the explanation of regional governance arrangements. annual meeting of the American Political Science Association, Atlanta, Georgia.

Boyce, C., et al. (2006). Conducting In-depth Interviews: A Guide for Designing and Conducting In-depth Interviews for Evaluation Input, Pathfinder International.

Bressers, H., et al. (2015). Benefit of Governance in Drought Adaptation – Governance Assessment Guide.

Bressers, H., et al. (2016). Governance for Draught Resilience - Land and Water Draught Management in Europe, Springer Open.

Bressers, H. and C. de Boer (2013). "Contextual interaction theory for assessing water governance, policy and knowledge transfer." Water Governance, Policy and Knowledge Transfer: International Studies on Contextual Water Management 36.

Bressers, J. T. A. and S. M. Kuks (2003). "What does Governance mean?".

Brown, R. R. and M. A. Farrelly (2009). "Delivering sustainable urban water management: a review of the hurdles we face." Water Science and Technology 59(5): 839-846.

Casiano Flores, C., et al. (2016). "Water Governance Decentralisation and River Basin Management Reforms in Hierarchical Systems: Do They Work for Water Treatment Policy in Mexico's Tlaxcala Atoyac Sub-Basin?" Water 8(5): 210.

Chatterjee, P. (2016). "Urban policy-making overlooking medium-sized cities, researchers warn at Habitat III." Decentralization Retrieved 5 July, 2017, from

http://citiscope.org/habitatIII/news/2016/10/urban-policymaking-overlooking-medium-sized-cities-researchers-warn-habitat.

Community Advisory Group (2017). CAG Comments on the Draft Environmental Impact Statement (DEIS) for the Rebuild By Design Hudson River Project. D. Rosenblatt, Community Advisory Group

Davenport, C. (2017). Trump Budget Would Cut EPA Science Programs and Slash Cleanups. New York Times. New York City.

De Boer, C., et al. (2016). "Collaborative Water Resource Management: What makes up a supportive governance system?" Environmental Policy and Governance 26(4): 229-241.

De Boer, C., et al. (2013). Water Governance, Policy and Knowledge Transfer: International Studies on Contextual Water Management, Routledge.

Dewberry (2017). Rebuild by Design - Hudson River Project. Feasibility Study Report, Dewberry.

Driessen, P., et al. (2016). "Toward more resilient flood risk governance." Ecology and Society 21(4).

Edwards, N. and P. M. Barker (2014). "The Importance of Context in Implementation Research." JAIDS Journal of Acquired Immune Deficiency Syndromes 67: S157-S162.

Flores, C. C. and C. de Boer (2015). "Symbolic implementation: Governance assessment of the water treatment plant policy in the Puebla's Alto Atoyac sub-basin, Mexico." International Journal of Water Governance 3(4): 1-24.

Flyvbjerg, B. (2006). "Five misunderstandings about case-study research." Qualitative inquiry 12(2): 219-245.

George, A. L. and A. Bennett (2005). Case studies and theory development in the social sciences, Mit Press.

Gerring, J. and R. McDermott (2007). "An Experimental Template for Case Study Research." American Journal of Political Science 51(3): 688-701.

Giacchino, S. and A. Kakabadse (2003). "Successful policy implementation: the route to building self-confident government." International Review of Administrative Sciences 69(2): 139-160.

Griswold, N. (n.d.). "Green Roof Policy Brochure." Retrieved 13 Apr, 2017, from http://www.greenroofs.org/index.php/about/aboutgreenroofs/328-policy-brochure-2014.

Hegger, D., et al. (2013). Flood risk management in Europe: similarities and differences between the STAR-FLOOD consortium countries, STAR-FLOOD Consortium.

Hewitt de Alcántara, C. (1998). "Uses and abuses of the concept of governance." International Social Science Journal 50(155): 105-113.

Hoboken (2017). "Flooding Information." Retrieved 30 Mar, 2017, from http://hobokennj.gov/departments/environmental-services/storm-flood-zones/.

Jacobsen, M., et al. (2013). "User's Guide on Assessing Water Governance." Oslo: UNDP Governance Centre.

Lara, A., et al. (2017). "What do people think about the flood risk? An experience with the residents of Talcahuano city, Chile." Natural Hazards 85(3): 1557-1575.

Larsen, T. A. and W. Gujer (1997). "The concept of sustainable urban water management." Water Science and Technology 35(9): 3-10.

Lavelle, M. (2016). Americans in Danger From Rising Seas Could Triple. National Geographic.

Leeuw, F. L. (2003). "Reconstructing program theories: Methods available and problems to be solved." American journal of evaluation 24(1): 5-20.

Meier, K. J. and D. R. McFarlane (1995). "Statutory coherence and policy implementation: The case of family planning." Journal of Public Policy 15(03): 281-298.

Mossberger, K. and H. Wolman (2003). "Policy transfer as a form of prospective policy evaluation: Challenges and recommendations." Public administration review 63(4): 428-440.

Niles, M. T. and M. Lubell (2012). "Integrative frontiers in environmental policy theory and research." Policy Studies Journal 40(s1): 41-64.

OECD (2015). Water Governance Indicators and Management Frameworks, Organisation for Economic Cooperation and Development.

Ostrom, E., et al. (2007). "Going beyond panaceas." Proceedings of the National Academy of Sciences 104(39): 15176-15178.

O'Toole, L. J. (2000). "Research on Policy Implementation: Assessment and Prospects." Journal of Public Administration Research and Theory: J-PART 10(2): 263-288.

Pacheco-Vega, R. (2015). "Urban wastewater governance in Latin America." Water and Cities in Latin America: Challenges for Latin America, edited by Ismael Aguilar-Barajas, Jurgen Mahlknecht, Jonathan Kaledin, and Anton Earle. London, UK: Earthscan/Taylor and Francis: 102-108.

Pawson, R. and N. Tilley (1997). "Realist evaluation." Changes.

Pfadenhauer, L. M., et al. (2017). "Making sense of complexity in context and implementation: the Context and Implementation of Complex Interventions (CICI) framework." Implementation Science 12(1): 21.

Pierson, P. (1993). "When effect becomes cause: Policy feedback and political change." World politics 45(04): 595-628.

Postal, A. D. (2013). "FEMA Report Ponders Effect of Climate Change on NFIP."

Rose, R. (1991). "What is lesson-drawing?" Journal of Public Policy 11(01): 3-30.

Rosenau, J. (2000). "The governance of fragmegration: Neither a world republic nor a global interstate system." Studia Diplomatica 53(5): 15-40.

Rouillard, J., et al. (2016). "Governance Regime Factors Conducive to Innovation Uptake in Urban Water Management: Experiences from Europe." Water 8(10): 477.

Santiso, C. (2001). "World Bank and good governance: good governance and aid effectiveness: the World Bank and conditionality." Geo. Public Pol'y Rev. 7: 1-137.

Seawright, J. and J. Gerring (2008). "Case Selection Techniques in Case Study Research: A Menu of Qualitative and Quantitative Options." Political Research Quarterly 61(2): 294-308.

Stoker, G. (1998). "Governance as theory: five propositions." International Social Science Journal 50(155): 17-28.

Together North Jersey (2013). Hoboken Green Infrastructure Strategic Plan. Hoboken, NJ.

Together North Jersey (2017). "About." Retrieved 02 Apr, 2017.

Town Charts (2015). "Hoboken, New Jersey Demographic Data." 2017, from http://www.towncharts.com/New-Jersey/Demographics/Hoboken-city-NJ-Demographics-data.html.

U.S. News (2017). "10 States most at risk of flooding." Retrieved 26 April, 2017, from https://www.usnews.com/news/slideshows/10-states-most-at-risk-of-flooding?slide=7.

UNESCO (2017). "Education - Concept of Governance." Retrieved 04 Apr, 2017, from http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/concept-of-governance/.

UNISDR (2012). Making Cities Resilient Report 2012, The United Nations Office for Disaster Risk Reduction, : 6-94.

United States Environmental Protection Agency (2017). "Green Infrastructure - Managing Flood Risk." Retrieved 30 Jun, 2017, from https://www.epa.gov/green-infrastructure/manage-flood-risk.

Vikolainen, V., et al. (2013). "The transfer of Building with Nature approach in the context of EU Natura 2000." Water Governance, Policy and Knowledge Transfer: International Studies on Contextual Water Management: 242-262.

Worstell, C. (2013). Green Infrastructure in the State of New Jersey - Statutory and Regulatory Barriers to Green Infrastructure Implementation, New Jersey Future.

Zainal, Z. (2007). "Case study as a research method " Jurnal Kemasuniaan 9: 1-5.

Zernike, K. (2013). Hoboken Mayor Seeks Storm Protection More Suitable for High-Rise Buildings. The New York Times. New York