"Policy Is What We Make of It": an Interpretive Study of Governance in an Urban Watershed

Aritree Samanta
Cleveland State University
“POLICY IS WHAT WE MAKE OF IT”: AN INTERPRETIVE STUDY OF GOVERNANCE IN AN URBAN WATERSHED

ARITREE SAMANTA

Bachelor of Arts in Economics
University of Delhi
July 2006

Master of Arts in Social Work
University of Delhi
July 2009

Submitted in partial fulfillment of requirements for the degree:

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We hereby approve this dissertation for

Aritree Samanta

Candidate for the Doctor of Philosophy in Urban Studies and Public Affairs degree

for the

Maxine Goodman Levin College of Urban Affairs

and the CLEVELAND STATE UNIVERSITY

College of Graduate Studies by

----------------------------------------
Dissertation Chairperson, Wendy A. Kellogg, Ph.D.

----------------------------------------
Department & Date

----------------------------------------
Dissertation Committee Member, Nicholas C. Zingale, Ph.D.

----------------------------------------
Department & Date

----------------------------------------
Dissertation Committee Member, Nancy Meyer-Emerick, Ph.D.

----------------------------------------
Department & Date

----------------------------------------
Dissertation Committee Member, Heidi Gorovitz Robertson, J.D., J.S.D.

----------------------------------------
Department & Date

Student’s Date of Defense: March 30th, 2017
This dissertation is dedicated to Surekha and Asis Samanta
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ARITREE SAMANTA

ABSTRACT

This study explores the governance of an urban watershed using a combination of interpretive approach and resilience framework. The key idea within resilience and social ecological systems (SESs) discourse is to link ‘human systems’ (e.g. communities, society, economy) with ‘natural systems’ (e.g. ecosystems, biophysical elements) and to understand the interconnections and feedbacks between these systems. Under resilience thinking SESs (e.g. urban environmental) are viewed as complex adaptive systems, therefore, adaptive governance is key for maintaining long-term sustainability of these systems. With this study, I examine the case of the Cuyahoga River in Northeast Ohio, an urban watershed with legacy pollution and water quality issues, which in the recent times has also been recognized as an icon in water management. To do so, I conducted an interpretive analysis using a combination of political ethnography, interpretive phenomenological analysis (IPA), and social network mapping. Specifically, I conduct a characterization and analysis of an urban watershed, bringing the resilience and SES frameworks to the study of urban SESs. I also develop a conceptual framework for analyzing urban watersheds based on SES dynamics and resilience attributes that are critical for building adaptive capacity, explicitly focusing on governance and management influences. Further, I explore what the networked approach to watershed governance in the Cuyahoga River watershed mean to the governance actors in terms of building long-term adaptive capacity. I suggest that using approach and through continued dialogue and discourse, governance actors create and bind policy meanings.
that overtime transforms governance. I suggest that the lessons drawn from this study will provide insights for watershed managers, public agencies, and non-governmental organizations to enhance their long-term capacity-building mechanisms and processes that support watershed planning, policy development, implementation and decision-making.
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CHAPTER I

INTRODUCTION

Policy processes are complex, emergent, and dynamic. Actors and stakeholders shape meanings of policies through their perceptions, dialogues, and collaborations, which in turn shapes resource management actions. This happens within a collaborative or networked governance context. Actors also actively shape creation of adaptive capacity for governance to respond to changes and disruptions. The purpose of this dissertation is to understand this process through the case of the Cuyahoga River watershed in Northeast Ohio.

The Cuyahoga River is recognized as an icon in water management in the United States. As many rivers flowing through dense industrialized and urbanized landscapes of the Great Lakes region have for most part of the twentieth century; the Cuyahoga River has seen dramatic alterations in its ecosystem and the services that this ecosystem provides. This is emblematic of the industrial and urban legacy of the United States where water resources were exploited to such an extent that their ecosystem services were threatened (Fitzhugh & Richter, 2004). The Cuyahoga River had legacy and
sustained pollution issues that led to several fires, including the 1969 fire that caught the attention of the national media and was a catalyst of sorts for the passage of the 1972 Federal Clean Water Act. Post 1950s, much of Northeast and Midwest region of the United States, including Cleveland was deindustrializing and undergoing an urban decline. This resulted in a decreasing benefit from industrial places while simultaneously shaping people’s perceptions about an environmental crisis and the ensuing environment movement (Stradling, 2008). Contrary to the popular perceptions, cleanup of the Cuyahoga River started prior to the famous 1969 fire, when local industry and municipal leaders formed the Cuyahoga River Basin Water Quality Committee and started mobilizing funds for local action in the 1960s (Adler, 2004). Critical improvements came about after passage of the Federal Clean Water Act (CWA) in 1972, and when the International Joint Commission designated the Cuyahoga River as one of the 43 Great Lakes Areas of Concern (AOC) in 1985 under the Great Lakes Water Quality Agreement. In 1988, the Cuyahoga Remedial Action Plan (RAP) Committee was appointed to address pollution problems affecting the beneficial use of the river in the Cuyahoga Area of Concern (AOC).

Over time, industries stopped releasing effluents and trash into the river, cities along the river upgraded their sewage treatment plants, and the closing of numerous steel mills and other industrial facilities reduced ongoing pollution. Deindustrialization, an increasing public demand for cleaning up the river, and the regulation of direct discharges from manufacturing plants, factories, pipes, and sewage plant through National Pollutant Discharge Elimination System (NPDES) reduced point source pollution, effectively restoring some of the ecosystem properties that the river and the watershed had lost.
Cleaner water and post-industrial changes spurred river restoration activities that have emerged in the past decade in the overall protection and management of the river watershed. Problems today include contaminated sediments and combined sewer outfalls in the lower section of the river and continued soil erosion and nonpoint source pollution from upstream development habitat issues in the main stem of the river and the tributary watersheds. These issues continue to affect the ecological integrity of the Cuyahoga River watershed and have a substantial impact on the quality of life and economic redevelopment opportunities in the area.

The effort to restore the health of the river watershed over the past four decades has come about not just through top-down policy efforts and implementation of federal mandates, but also through concerted local action. A complex natural resource management problem like that posed by the restoration and regeneration of the Cuyahoga River watershed has required coordinated action by a range of stakeholders including government agencies at the federal, state and local levels; nonprofit organizations; private businesses; and individuals. Some of these collaborations are intentionally created by agencies, and others are self-organized. Collaborations such as these play a key role in building trust, along with providing information and encouraging the development of common perspective or at least a common enough perspective on natural resource related “wicked” policy issues (Folke et al., 2005; Tidball & Krasny, 2007). How were these collaborations formed? How and why did the current form of governance of the Cuyahoga River emerge? How do actors/agents shape the governance of the river? How does the meaning of the resource itself shift through the process of governance? These are some of the broad questions that gave impetus to this research study.
In this research, I use the concept of governance as it is understood within public administration, policy, and natural resource and ecosystem management scholarship. Broadly, governance refers to structures and processes through which people in society make decisions (Folke et al., 2005). Governance can be “any pattern of rule that arises either when the state is dependent upon others or when the state plays little or no role” (Bevir, 2009, p. 3). Markets, networks, and non-state actors play a key role in governance, thereby weakening the distinction between states and other domains of social order (Bevir, 2009). Governance also creates conditions for collective action or institutions of social coordination (Folke et al., 2005). For natural resources, governance refers to the structures and processes that provide the social and the institutional environment for management to take place. This concept is well suited to the study of management of natural resources, especially in an urban context. Since the natural environment and human aspects of societies have interactions, dependencies, variations, and complex dynamics, and because SESs do not abide by human-made jurisdictions and administrative boundaries, top down management is poorly suited for such systems as they cannot be divided into separate and autonomous components. Therefore, governing systems consisting of multiple actors with various degrees of involvement in the governing processes is well suited for managing complex SESs. The basic rationale being that involvement of various actors in governing process can help in addressing the complexities inherent in ecosystem and social arrangements in SESs (Bodin & Crona, 2009). Furthermore, management of SESs can benefit from actors agreeing on common rules and practices, coordinating actions, engaging in conflict resolution, sharing information, and creating opportunities for building common knowledge – requiring a
different kind of a management process rooted in organizational and institutional flexibility for dealing with uncertainty and change. This is referred to as adaptive governance (Bodin & Crona, 2009; Folke at al., 2005).

I use the resilience and social-ecological systems (SESs) framework to organize this study of governance. The concept of SES emphasizes a humans-in nature perspective and can be understood as an “integrated system of ecosystems and human society with reciprocal feedback and interdependence” (Folke et al., 2010). I conceptualize this research study with the understanding that the Cuyahoga River watershed is a complex urban SES. The concept of resilience is key to understanding the adaptability and transformability of SESs over time. The most commonly used definition of resilience by scholars of ecology and natural resources is that it is “the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure and feedbacks” (Walker et al., 2004), in other words, “the ability persist and the ability to adapt” (Adger, 2003, p. 1). This conceptualization acknowledges the existence of multiple equilibria for systems, and the possibility of systems to flip into alternative states (Davoudi, 2012). Resilience and adaptability of an urban watershed system wouldn’t mean getting it back to its pre-human intervention pristine state, but creating conditions for the healthy functioning of the SES under a different and altered set of conditions and elements. This is key for understanding urban watershed governance, especially in a legacy watershed such as the Cuyahoga River. Therefore, here, I focus on the concept of evolutionary resilience, which is “the ability of complex social-ecological systems to change, adapt, and, crucially, transform in response to stress and strains” (Davoudi, 2012, p. 302). This alternative view of resilience better accounts
for the possibility of systems not just adapting, but actively transforming or preparing for innovation transformations. Evolutionary resilience promotes understanding of places as complex, interconnected socio-spatial systems with constant and unpredictable feedbacks, and thus rejects fixity and rigidity. Evolutionary resilience is also more compatible with interpretive approaches to planning and policy as these both of these approaches emphasize on “fluidity, reflexivity, contingency, connectivity, multiplicity and polyvocality” (Davoudi & Strange, 2009, p. 37).

I explore governance and policy implementation in an urban watershed using an interpretive approach grounded in hermeneutics (as an alternative approach to traditional policy implementation research) to bring forth the meanings, experiences, and nuances of actors/agents in everyday policy implementation or practice of policy. The Cuyahoga River watershed system is first characterized as an SES with inherent complexities, components, and feedback between components. This characterization also includes the current and the past regimes of the Cuyahoga River watershed SES, and historic, ongoing, and future disturbances. The governance and management of the system includes the key federal and state policies associated with governing water pollution control and mitigation, the institutional mechanism, and the key actors involved in policy implementation and day-to-day management of the resource.

The key elements that anchor the understanding of watersheds as SESs are human cognition, intentionality, and choices that influence decision-making as these shape interpretation and meaning-making (of laws, regulations, and administrative action) and how actors shape implementation and governance. An interpretive approach has the ability to access actors’ experiences and meanings of everyday practice of governance.
and is also a means to access local knowledge regarding effectiveness of policy implementation. The interpretive insights from this study are helpful in drawing higher level theoretical connections to understand how hermeneutics, meaning-making, and a dialogical understanding (understanding of a shared world between agents) leads to a transformation in understanding of SESs and the processes through which they are governed.

By studying the Cuyahoga River watershed through an SES lens, understanding in-depth the governance and management influences, examining the meanings that the governance actors associate with the practice of policy and the management of the resources, and interpretively exploring (via hermeneutics) the ontological transformations in understanding of governance process and practice of governance, I present an emergent picture of how governance in a watershed became adaptive through the intentional choices and influences of human decision-making. Furthermore, hermeneutics helped me delve deeper into the thought process of actors to explore how a shift in ontological understanding leads to not just adaptive governance practices but also creates conditions for a long-term transformation in governance.

The interpretive approach that I use to conduct this research accounts for subjectivity, intentionality, and meaning in the practice of governance and policy implementation. The philosophical claim that is the basis of interpretive studies of public policy in general and this research study in particular is that “meaning does not merely put a particular affective or evaluative gloss on things, but that it is somehow constitutive [original emphasis] of political actions, governing institutions, and public policies” (Wagenaar, 2011, p. 4). Policymaking and implementation is a complex process. While
policy makers can be of one mind in operationalizing a policy, when it comes to implementation where multiple players are involved, policy “becomes a battle to determine a correct reading of the mandates and its accurate execution” (deLeon & deLeon, 2002, p. 474-475). Since statutory law cannot fully dictate administrative action, policies require interpretation (deLeon & deLeon, 2002). Policies have multiple meanings; they are enacted with a meaning and assume multiple meanings over time in the process of being implemented (Yanow, 1996); there is inevitable pluralism in policy, and to understand policy urgency, implication, and participation is required (Wagenaar, 2011). Since human actions are not literal and instrumentally rational, as observed and assumed by the mainstream policy analysis and implementation studies, an interpretive approach “is one that focuses on the meanings of policies, on the values, feelings, or beliefs they express, and on the processes by which those meanings are communicated to and “read” by various audiences” (Yanow, 2000, p. 14).

Scholars have stressed the importance of understanding policy implementation and administration, in the present “age of governance.” Governance broadly can be defined as the exercise of public or private authority “concerned with creating the conditions for ordered rule and collective action” (Milward & Provan, 2000, p. 360). Governance as a concept has emerged in the past two decades and marks a shift in hierarchical bureaucracy towards a greater use of markets, quasi-markets, networks, and other collaborative arrangements (Heinrich, Lynn, & Milward, 2009). Policy implementation spans multiple administrative layers, and can be understood as multi-level governance. The emergence of the concept of governance illustrates a change in the nature of politics and policy-making. It indicates a shift from the traditional notion of
politics, expanding it to bring in new sites, actors, and themes. The concepts of ‘Governance’ and ‘network’ are part of the network society in which we currently live. The idea of a network society draws attention to the complex pattern of social interaction within policy processes. The traditional manner in which policy and administration is designed and conducted focuses on linear lines of authoritative controls and hence obfuscates the complexity within these processes (Torgerson, 2003). Morçöl (2012) asserts, “Public policy processes are complex,” “public policy is an emergent, self-organizational, and dynamic complex system. The relations among the actors of this complex system are non-linear and its relations within its elements and with other systems are co-evolutionary” [original emphasis] (pp. 8-9).

In the Cuyahoga River watershed stakeholders shape the manner in which polices are understood and implemented. The meanings of policies are shaped and reshaped with dialogue and discourse within the informal, emergent networks and through a host of collaborative projects and partnership activities in which stakeholders and governance actors are involved. By using a methodological approach grounded in hermeneutics using a combination of ethnography, interpretive phenomenological analysis, and social network mapping, I provide a contextual and situated understanding of multi-layered, multi-actor, complex governance in the Cuyahoga River watershed.

**Research Statement and Questions**

The Cuyahoga River watershed has a formal institutional structure for policy implementation because of its environmental and socio-political history and current significance to the ecology and economy of the Great Lakes region. A traditional policy implementation approach assumes that the resource problem is well bounded and clearly
defined. This process is based on an institutional, traditional, hierarchical organizational structure or bureaucracy. In the local-level implementation context, this structure becomes more complex with added hierarchical dimensions (national or state level agency, regional level agency, local level agency), but still functions within a ‘command and control’ framework. However, watersheds are complex and non-linear, where predicted outcomes are expected but rarely obtained (Holling & Meffe, 1996; Yanow, 1996).

Management of the Cuyahoga River watershed involves multiple actors involved to varying degrees, with overlapping and interconnected networks that collaborate to produce environmental and policy outcomes in the watershed. Policy implementation takes place through the various plans, projects, and programs to restore the ecological health and ecosystem properties of the river and the watershed. Issues of mitigation of water pollution, land-use within the watershed, commerce and navigation, economic redevelopment and revitalization, and access and recreation make the watershed a complex policy and governance setting.

In the Cuyahoga River watershed, governance mechanisms are steered by the federal and state policies and regulations, but there is also a focus on social practices, local culture, and citizen partnership and participation in the governance. Here policy implementation is “dependent on diverse stakeholders with formal and informal links to one another” and “where patterns of rules operate in and through groups in the voluntary and private sector” (Bevir, 2012, p. 5). In addition, for the myriad of policies governing the watershed, the assumption of a single meaning when initially legislated, may come to convey additional meanings as policies get implemented over time and at successive
organizational and governmental levels (Yanow, 1996). Since there are a range of actors and stakeholders involved with the governance processes, various actors share thoughts, speech, practice, and meaning in policy relevant groups that become “interpretive communities.” These interpretive communities form a shared understanding of policy ideas that might be different from the ideas and understanding by other groups/communities (Yanow, 2000). Accessing these meanings or interpretations (of actors and their interpretive communities), understanding the local context of policy implementation, understanding and how these meanings shape the networks and collaborations that the actors and stakeholders create and the actions that they undertake, is the focus of this research.

The questions that guide this research project are:

- **What are the various influences and dynamics that shape the Cuyahoga River as a watershed SES? How can a watershed SES be characterized and understood so that the influence of governance on system attributes and the attributes critical for building adaptive capacity are identified?**

- **How do actors/agents make sense of policy implementation and the realities of everyday governance? “How do the policies mean” and how do the meanings shift in the process of implementation? How does that in turn affect the implementation process itself, and the meaning of the resource overall over time?**

- **Why is it important to understand meanings to understand governance? Why do the various actors and stakeholders come together? How do they bind policy meanings and experience meaningful inclusion through participating in governance?**
The nature of the questions progress from procedural description and characterization to a more theoretical-level exploration. The set-up of the research and the dissertation moves from understanding the nuts and bolts of the features and elements of an SES, to the abstract, higher-level meanings of the actors in the governance of the resource, to a theoretical-level exploration of hermeneutics, hermeneutic space, and a shift in tradition, authority, and prejudice associated with governance.

Since this research is grounded in an interpretive philosophy, the purpose of the analysis and insights presented is “theoretical transferability rather than empirical generalizability” and an in-depth understanding of one of the most complex urban watershed governance settings in the United States.

The vocabulary of governance is yet to come into terms with phenomenology and hermeneutics and this study attempts to move this vocabulary forward. Using an interpretive approached rooted in hermeneutics and phenomenology, I fuse together two research approaches and propose a novel research method to study watershed governance. This method can be used not only for water management studies, but can also be used for other environmental management, urban resource management, and policy research settings. These results will provide insights for the public agencies, non-governmental organizations, and other participants interested in effective management of urban resources.

**Organization of Dissertation**

The next chapter presents the literature review that guides this study. The project draws from research on complexity theory in public policy, resilience and social-ecological systems theory and framework, governance and governance networks,
collaborative environmental management, adaptive governance and management, interpretive policy analysis, and phenomenology and hermeneutics.

Chapter Three presents the logic of inquiry and the conceptual framework for the study. A step-by-step discussion on the logic that guides the method and the approach used to conduct the study is justified. Merits of the interpretive approach are justified for the case study, as an alternative to using a traditional approach and methodological framework to study policy implementation. This chapter also presents the conceptual framework that guides data collection and analysis.

Chapter Four presents a description of the philosophical background and the research design that combines three research approaches – ethnography, interpretive phenomenological analysis, and network mapping. Also presented are the instruments and procedures of data collection, limitations of the study, and the evaluative standards for interpretive studies and how this project meets those standards.

Chapter Five, the first results chapter, addresses the characterization of the focal system, i.e. the Cuyahoga River watershed area that is the focus of the study and analysis. An ecosystem assessment of the focal system is presented along with an assessment of the ecosystem properties derived from each stage of the environmental history of the river watershed. Also presented are past and ongoing disturbances, and future uncertainties. The resilience assessment part of this chapter examines the biophysical and social features, and the governance and management influences in the watershed, including results from the network mapping exercise (Mitchell et al., 2015; Resilience Alliance, 2010; Ernstson et al., 2010). A summary discussion presents the resilience
assessment results for evaluating the characteristics/extent of adaptive governance in the watershed identifiable from these sets of results.

Chapter Six, the second results chapter, presents the meanings that the actors/agents derive out of their everyday policy implementation and practice of administration, and the realities of everyday governance. A combination of frameworks is used to arrive at meanings that emerge among the various communities of practice and interpretive communities involved in watershed management. The steps of the overall analysis are informed by Yanow’s (2000) interpretive policy analysis framework, and an interpretive phenomenological analysis technique by Smith, Flowers, and Larkin (2009) is used to analyze the interview data. Results present various categories of meaning and their dimensions and how the policy relevant groups make sense of the policy and governance processes. The collaborative opportunities and actions and partnerships on nonpoint source issues opened space for dialogues that changed the dominant narrative associated with the river. Actors understood the interconnections between water quality and other aspects such as place making and protection and restoration actions. They understood that just focusing on water quality through fulfilling a mandate is not enough. The collaborative process and community involvement led to retelling of the story of the river as a local asset.

Chapter Seven, the third results chapter, presents the theoretical framework that emerged from the analysis of the policy meanings. Since theory is an anchor for all interpretive studies, the theoretical framework presented in this chapter provides a lens to understand the governance process, the categories of meanings of actors, outcomes of the watershed management, and the experiences of the everyday realities of governance (by
the actors). I use Gadamer’s concepts of tradition, authority, and prejudice to 1) understand the overall shift in the eras of watershed management (at a regulatory level); and 2) the shift in governance of the Cuyahoga River watershed owing to the hermeneutic space and an understanding rooted in dialogic notion of meaning that was created through collaborations and dialogues among actors involved in co-management activities in the watershed.

Chapter Eight presents a discussion on adaptive governance. Summarizing each of the results chapters (Chapters Five, Six, and Seven), I outline how key insights from the chapters demonstrate the presence of elements of adaptive governance. Results suggest that the governance over the past two decades have built capacity for adaptation within the watershed, including capacity to self-organize, flexible organizational management and maintenance of institutional memory, building of social learning opportunities, and advancement of a culture of adaptive and facilitative leadership. This chapter also describes how the results and insights from this research can be used by watershed planners, watershed managers (government agency staff, public administrators), and watershed stakeholders (watershed groups and partnerships, citizen groups) to best design governance and to plan for resiliency and adaptive management of the systems in face of future uncertainties. The chapter ends by suggesting directions for future research on interpretive watershed governance.
CHAPTER II

LITERATURE REVIEW

Introduction

This study centers on three main streams of literature derived from three disciplinary areas, each with its own body of work but with significant overlaps. These streams are complex environmental resources and their governance from policy and public administration disciplines, natural resource management and the theories and methods related to the concepts of resilience and social-ecological systems, and phenomenology, philosophical hermeneutics, and interpretive approaches. The following sections present each stream of literature in-depth to build a conceptual foundation for the design of this study.

Complexity

There is wide recognition that the world that we live in today is a complex one. A system is complex when it cannot be understood or described fully by analyzing just its components (Morçöl, 2012). Complexity theory and complexity studies are used to study complexity or complex systems (Morçöl, 2012; Holling, Gunderson, & Ludwig, 2002).
Within complexity studies ecological, economic, and social systems are seen as similar to biological processes that generate variability (Holling, Gunderson, & Peterson, 2002). Complexity can be defined as “the property of a real world system that is manifest in the inability of any one formalism being adequate to capture all its properties” (Mikulecky, 2007, p. 344) and is characterized by “a) a large number of similar but independent elements or agents; b) persistent movement and responses by these elements to other agents; c) adaptiveness so that the system adjusts to new situations to ensure survival; d) self-organization, in which order in the system forms spontaneously; e) local rules that apply to each agent; and f) progression in complexity so that over time the system becomes larger and more sophisticated” (Valle, 2000, p. 4).

It has also been a growing recognition that complexity as a concept and as an issue needs to be accounted for while understanding the possibilities and limits of human action and has implications for public policy and policy sciences (Wagenaar, 2011). Complexity within contemporary societies and the rapid change that they are facing have also created an increasing awareness among policy leaders of the limits to hierarchical control by government agencies and to formal expertise in solving problems” (Innes & Booher, 2010, p. 197).

The connections of complexity theory to public policy and policy processes; the role of context, participation, and local knowledge; and the ways to access such knowledge in understanding the implications of policy are discussed in the next chapter.

**Social-Ecological Systems and Resilience**

A quest to find a theoretical framework and processes for understanding complex systems, ecologists and system theorists such as Holling (1978, 2001),
Gunderson and Holling (2002), Scheffer et al. (2009), and Folke et al. (2002) presented the concepts of “resilience” and “panarchy,” which were subsequently developed as Resilience Theory to understand complex social-ecological systems (SES). This body of knowledge came to be developed as social-ecological system research. Ecology, natural resource management, resilience, organizational, and human resources literature provide evidence that focus of research is shifting away from a search for stability to the acceptance of the need for adaptability in systems and processes. In the latter half of the twentieth century along with the advent of sustainability, also emerged an alternative, non-equilibrium paradigm of science, of systems, and of understanding the natural and built environment (Botkin, 1990). This view, known as non-equilibrium theory, shed light on the inherent variability and uncertainty of natural and cultural systems (Ahern, 2011).

The Resilience Alliance describes SESs as “complex, integrated systems in which humans are part of nature” (Du Plessis, 2009). Within this broad framework of understanding systems as social-ecological systems that accounts for uncertainty and variability of target resources and actors, the concept of resilience incorporates the “idea of adaptation, learning, and self-organization in addition to the general ability to persist disturbance” (Folke, 2006, p. 259). The concept of “panarchy” explains cross scale dynamics in natural and social systems. Within panarchy, change is described as an adaptive renewal cycle of breakdown and release, reorganization, growth and exploitation, and conservation (Holling, Gunderson, & Peterson, 2002). Watersheds and urban regions or cities within which they are located can be understood as SESs. This perspective helps in understanding relationships and dynamics between different scales
and components of the SES, and the role of human foresight and intentionality that can create capacity to reorganize a system and create resilience to reorganize in the face of change (du Plessis, 2009; Holling 2001; Folke et al., 2005).

The literature on resilience and SES is useful for studying a complex watershed governance issue, as this theoretical perspective is in stark contrast to perspectives that are equilibrium centered that govern most of the command-and-control policy strategies (Folke, 2006). Holling and Meffe (1996) assert that such social-ecological systems become less resilient to disruptions under command-and-control policy and resource management regimes, as such regimes seek to reduce the naturally occurring variability within SESs. Thus planning and regulatory processes that are guided by an understanding based on systemic complexity, feedback, and interactions should “take into account issues of behavior, relationship, resource flows and resilience across the social-ecological system; and acknowledge that uncertainty and unpredictability is a characteristic of cities that requires adaptive management and flexibility in implementation” (d’u Plessis, 2009).

**Governance**

Governance provides a good organizing framework to study structures and processes by which people make decisions in societies. In the context of current complex systems with wicked problems the term governance is viewed as an alternative to command-and-control management; one that allows for collaboration, partnerships, and networks (Folke et al., 2005). Governance, as a way to organize efforts, marks a shift from formal command-and-control forms of government and hierarchical institutional processes of management of natural resources to processes that are characterized by collaboration, negotiation, and deliberation among members, actors, or stakeholders.
involved in the planning or policy processes (Neef, 2009). The focus of this study is governance as it relates to the management of natural resources in general and water resources in particular.

Governance is the process of creating conditions for ordered rules and collective action through the structures and processes through which people in societies make decisions and share power. Governance can be institutionalized or expressed through more subtle and indirect forms of interactions between actors regarding decisions of accessing resources and policy implementation and change (Lebel et al., 2006). Governance can be defined as the structures and processes through which power is shared within societies, which in turn shapes individual and collective actions (Lebel et al. 2006). However, the concept of governance has been interpreted in many ways. Klijn and Koppenjan (2000) summarize the interpretations into two basic groups – first are scholars who view the concept of governance as something that is marked by a reduced role of government in favor of more independent ways to govern collective actions through an increased role of private and non-profit sectors; and second are the scholars who recognize the inevitable interdependencies among government, private, and non-profit sectors, with the state playing an integral role. Weber and Khademian (2008) further articulate that in the form of governance that is marked by interdependencies, the government remains a key actor among many. However, government has a responsibility toward the public that the other key actors do not have. This form of governance is especially useful in a complex resource management problem as it helps in coupling the vertical government responsibilities with building capacity in horizontal systems.
Along with the concept of governance, in the past two decades, the concept of collaboration or collaborative governance has also emerged. Ansell and Gash (2007) outline the high cost and politicization of regulations as well as failures related to their implementation, failures of managerialism, and a search for an alternative to interest group pluralism as some of the factors that have driven the emergence of such collaborative governance arrangements. In addition, the growth of knowledge has also been seen as one of the important factors that demand collaboration, as knowledge becomes more specialized and institutional structures become increasingly complex and interdependent. Ansell and Gash (2007) define collaborative governance as:

A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets (p. 544).

For water management in particular, the past few decades have seen a fundamental shift in the political economy of governance. Beginning in the 1960s, the top-down, hierarchical (or regulatory), command-and-control institutions at the federal and state level were established to address the collective-action problems with environmental issues in general. These worked in a technocratic fashion and used a combination of ambient standards, technological requirements, and emission criteria to manage environmental problems. While these traditional strategies and institutions were successful in reducing point-source pollution, the dissatisfaction and less success of these strategies to deal with nonpoint source pollution led to the collaborative approaches to watershed management since the 1980s. Natural resource problems such as
geographically diffuse nonpoint source pollution; problems of habitat destruction involving multiple media (such as air, water, and land) crossing across political and administrative boundaries; and administrative limitations, legitimacy issues, and ineffectiveness of the ‘traditional approach’ required a new approach to watershed decision making (Lubell et al., 2002; Sabatier et al., 2005).

This perspective of governance recognizes the role of diverse actors in the knowledge challenge posed by wicked problems. Addressing such problems require the need to share, understand, and integrate diverse understandings of the problem. Knowledge isn’t concentrated in a single government agency; in fact agencies play a critical role in soliciting, sharing, and integrating knowledge among diverse actors within a network. In doing so they integrate both traditional and nontraditional knowledge both within and outside government, and also facilitate the sending, receiving, and integration of new knowledge in the process (Weber & Khademian, 2008).

Within the broader concept of governance, much has been written about importance of the concept of interrelated networks of actors. Networks by no means signal the end of state authority or established institutions, in fact as Hajer and Wagenaar, (2003) argue, “the emergence of networks is not the end of state authority per se, but the redefinition of it, characterized by a much more open mind allowing for much more diversity and experimentation” (p. 5). Networks are structures of interdependence involving multiple actors or organizations that extend beyond the formally established linkages and policy-legitimated ties (O’Toole, 1997). Amin and Hausner (1997, p. 10) write that a society is comprised of “a web of interlocking networks of affiliation and interaction, which are structured around a multiplicity of institutions, formal and
informal.” Actors operate through associational networks, and while some networks are formally created, they can also be informal or ad hoc in nature. Formal collaborative networks are initiated by government entities and are usually supported through institutional interactions, whereas informal networks mobilize actors on a ‘as needs’ basis. The informal networks, which can either be emergent or organized through deliberate institutional intent, provide flexible structures that are inclusive and information rich, facilitating learning and knowledge creation, which are requisite for addressing “wicked problems” (Isett et al., 2011). Much has been written about the importance of governance networks and the role that they play in ecosystem management as well. Hahn (2011) points out the merits of governance networks within ecosystem management for their potential to enhance social learning, adaptability, and resilience in social-ecological systems.

Within the resilience and social-ecological systems literature focused on complex environmental problems, governance has been described as a process that includes laws, regulations, discursive debates, negotiation, mediation, elections, public consultations, protests, and other such participative decision-making processes. Some of the attributes of governance are, “participation, representation, deliberation, accountability, empowerment, social justice, and organizational features such as being multilayered and polycentric” (Lebel et al., 2006; p. 2). A key aspect of managing resilience in self-organizing systems is to effectively integrate the knowledge and understanding gained from different sources of knowledge (Lebel et al., 2006). This perspective is based on the understanding that “social systems are structured not only by rules, positions, and resources, but also by meaning and by the entire network of
communicating individuals and organizations at different levels of interaction, representing the social system involved in governance” (Folke et al., 2005).

The polycentric governance concept is extremely useful to understand the processes taking place within water governance regimes. Anderson and Ostrom (2008) define polycentric governance as “complex adaptive systems without one central authority dominating all others in regard to policy arenas” (p. 17). Several authors have recognized the merits of polycentric governance system, along with recognizing the inherent institutional complexity of such a governance form. Such forms of governance could potentially encourage experimentation with new rules, provide space for integration of expert and lay knowledge, and create of room for the inclusion of a broader range of non-state actors. The understanding of environmental governance also requires understanding how such issues are created, constructed, regulated, and contested through ad hoc or hybrid governing arrangements that operate as networks (Bulkeley, 2005).

Within sociology, resource exchange theorists elucidate that organizational actors attain resources in order to accomplish their goals, and when there are not sufficient resources for actors to accomplish their goals, they need to obtain these resources from others. This is at best an exchange process, where actors provide resources they hold in abundance and obtain the resources that are scarce. Exchange forms the basis of collaboration in policy arenas, and provides the grounds for interactions to multiple organizational actors. Thus actors make connections and reach out to other actors in order to obtain resources; these resources could be financial support, technical information, legal advice, political support, and public buy-in (Berardo, 2009).
Governance Networks

Torfing (2005) defines governance networks as: “(1) Relatively stable horizontal articulations of interdependent, but operationally autonomous actors who (2) interact with one another through negotiations, which (3) take place within a regulative, normative, cognitive, and imaginary framework that is (4) self-regulating within limits set by external forces and, which (5) contributes to the production of public purpose” p. 307).

Authors writing about public management write about the shift from more traditional hierarchical from of public governance, to marketization, and to networked governance, which forms the basis of new public management. According to Stoker (2006):

Networked governance…requires the state to steer society in new ways through the development of complex networks and the rise of more bottom-up approaches to decision making. Established institutional forms of governance appear under challenge, and new forms of governance appear to be emerging. Networked governance is a particular framing of collective decision-making that is characterized by a trend for a wider range of participants to be seen as legitimate members of the decision-making process in the context of considerable uncertainty and complexity (p. 41).

As outlined above, the ability of networked forms of governance to deal with uncertainty and complexity is key. Complexity and change within contemporary societies have created awareness among policy leaders about the limits of hierarchical control, and
have gradually led to a recognition of and movement towards democratic practices and institutions (Hajer & Wagenaar, 2003). Network governance fits well within this socio-political milieu, both in terms of increasing links across scales and levels of government, and often through informal networks (Innes & Booher, 2010).

**Informality/Informal Action**

As noted earlier, networks can be formally incorporated or can be more informal or ad hoc in nature, mobilizing various actors on a needs basis. Theorists within the policy networks literature view policy networks as communities that are based predominantly on interpersonal rather than formalized structure of governments. Authors such as Hillier (2000) and Rhodes and Marsh (1992) have recognized the shifting nature of alliances and the degree of openness of a network ranging from tightly knit policy community to relatively looser issue networks. In relation to the concept of direct action within a given political system, activities such as bargaining and decision-making become important. These activities often take place outside the formal rules and structures of authority. The actors in informal networks are bound by shared common ground, ideas, and values regarding a policy or environmental issue (Hillier, 2000).

Informal relationships are a potential resource for solving common collective action problems. Within political science literature the focus has been on formal institutions to solve collective action problems so far. Network approaches however, provide a novel way of looking at such problems by recognizing the role of informal relationships and self-organizing networks (Scholz et al, 2008). Informality can be looked at two ways with respect to networks – 1) less formally created networks, and 2) informal relationships within formal networks (Isett et al., 2011). Informal networks
consist of a wide range of interorganizational networks such as task forces, coalitions, *ad hoc* committees, etc. in which public and non-profit organizations participate that do not bind its members together through formal rules (Isett et al., 2011). These networks are known for being relatively emergent in nature, and function as important tools for the purpose of information sharing, problem solving, capacity building, and service delivery (Isett et al., 2011).

Within the natural resource management literature, Prell et al. (2010) categorize social structures as formal and informal, and view social networks as informal structures. Institutions or formal structures are the established norms, rules, and practices that both guide and constrain human behavior and action. Informal institutions are conventional practices, beliefs, social networks, cultures, and norms that either work with or challenge, or reinforce formal structures. The main argument that they put forward is that social networks are formed by the virtue of similarity in views, beliefs, and behavior among individuals. They describe this as the “homophily effect.”

Finally, the recognition of networks as informal structures has been outlined in public administration literature as well. For example, Provan and Kenis (2007) stress the reluctance among many network scholars to discuss formal mechanisms of control. Since networks are commonly associated with collaborative arrangements, they consider the concepts of institutions and/or governance and networks to be irreconcilable.

**Knowledge and Learning through Informal or Loose Networks**

Hillier (2000) notes that actors use their informal networks to obtain information. This might be technical information from local planning bodies or
government agencies, or information regarding happenings and knowledge advances regarding the policy or natural resource issue. Actors also use their networks to give information. Folke et al. (2005) outline the merits of informal networks, whereby key individuals play an important orchestrating role in such networks and help in the facilitation of information flows, identification of knowledge gaps, and creation of nodes of expertise that can be drawn upon at critical times. Gunderson, Holling, and Light (1995) further emphasize what they call the role of “shadow networks” as incubators of new approaches for the governance of social-ecological systems. Since these networks are formed outside the obligations of formal organizations and function independent to their scrutiny, they are more likely to develop alternative policies, newer learning experiences, and creative ways of finding resolution for resource problems. Informal social networks also provide arenas for novelty and innovation that leads to more flexibility. In terms of accountability, however, it must be understood that these network structures do not replace the existing institutional hierarchies, but operate within and complement them.

Within natural resource management, homophily (similar individuals are attracted to one another) has been discussed a key attribute of social networks. This can have two implications in terms of knowledge flow. Since similar individuals communicate through networks, they develop mutual understanding and are able to communicate implicit knowledge relatively easily. However, this process information is more likely to be diffused only through a small like-minded group and not to the larger heterogeneous populations (Prell et al., 2010).
In a study of six watershed programs to study collaboration as a governance strategy, Imperial (2005, p. 296) notes that “collaborative activities such as work groups, task forces, advisory committees, and other formal and informal staff interactions were frequent occurrence. These interactive processes are important because they help network members find ways to work together, generate new ideas, share knowledge, solve problems, build relationships, and develop trust.” Within informal networks, network members come together to coordinate services and “come together to exchange information and technologies, sequence programming, exchange resource opportunities, pool client contacts, and enhance access opportunities that leads to new programming avenues” (Agranoff, 2007, p. 10).

Social learning is a key aspect of social and political change and is an important outcome of governance through networks. Social learning has been defined as “a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks” (Reed et al., 2010). A key aspect of this definition is the mode through which learning occurs, i.e. through social networks. Social networks act as venues for social interaction and social learning, where processes of social learning allow actors to deliberate and negotiate rules, norms and power relations (Reed et al., 2010). These are some of the critical attributes of governance networks as well, as discussed in the previous sections. However, using the “homophily” argument, informal networks can be inherently unsuitable for knowledge diffusion and learning, as knowledge stays among smaller, relatively homogenous groups of like individuals and is not dispersed across the broader network. The relationship between the informal networks and social learning has
not been clearly articulated in the extant literature. Social learning processes have been seen as being akin to institutional learning and thus are inherently incompatible with the concept of informal networks (Folke et al., 2005).

**Collaborative Watershed Management**

The last two decades have seen the emergence of collaborative watershed management approaches to address diffuse, nonpoint sources of pollution of water in the United States. Since local land use patterns are closely linked with surface water health, collaborative approaches to watershed management have been designed to go well with local land use planning efforts. These approaches also have the potential to bring together diverse stakeholders that are associated with the management of water bodies, and foster cooperation among them (Hardy & Koontz, 2010; Sabatier et al., 2005). Sabatier et al., 2005, Hardy and Koontz (2008, 2010), Born and Genskow (2001), Genskow and Born (2006), Lubell (2003), Lubell et al., (2002), and Imperial (2005) have researched and written extensively about collaborative approaches to watershed management, collaborative institutions, watershed partnerships, collaboration as a governance strategy, and integrated water resource management. These authors have used a mix of theoretical literature and empirical research approaches to study the institutional and organizational factors affecting collaborative watershed management, as well as the outcome and/or success of such approaches.

Sabatier et al. (2005) in their book *Swimming Upstream: Collaborative Approaches to Watershed Management* propose a conceptual framework to understand collaborative watershed management approaches. In this framework, the authors integrate a number of contextual factors such as socioeconomic and ecological conditions,
government institutions, human and social capital, political efficacy, trust, legitimacy, and collective action beliefs that are associated with such management approaches. This implies that nature of the watershed management approach, as well as its probability of success, depends heavily on the context out of which it emerges. They also analyze several collaborative watershed-planning projects across the United States using both qualitative and quantitative methods.

Born and Genskow (2001) point out the uncertainties associated with watershed initiatives, especially in terms of the cause and effect relationship between partnership characteristics, actions, and accomplishments. The authors propose a multi-dimensional evaluation framework for watershed initiatives. Some of the dimensions and elements that are a part of this framework are social capacity, institutional changes, economic outputs, intermediate environmental outputs, and environmental outcomes. They also analyzed the exogenous and endogenous factors that potentially influence the success of watershed initiatives. In a later study, Genskow and Born (2006) study the organizational dynamics of watershed partnerships in an effort to understand the accomplishments and successes of such integrated approaches to water management. They emphasize the contextual dynamics that shape the institutional and organizational aspects of collaborative partnerships.

Imperial (2005) studies watershed management programs and the role of collaborations within each. The author develops the Levels of Collaborative Action Framework (LCAF) to understand the structural relationships of collaborative processes. This framework illustrates how collaboration occurs through operational, policy-making, and institutional levels of joint action. Imperial uses interorganizational networks as the
bases of his analysis, and asserts that collaborative activities involve different combinations of organizations within a watershed’s interorganizational network. He evaluates the collaborations within six watershed management programs to demonstrate the effectiveness of collaboration as a strategy for improving policy outcomes and enhancing governance.

Hardy and Koontz (2008) analyzed the nonpoint source pollution policies and programs across states in the United States. They studied the Clean Water Act’s Section 319 program across 50 states and state assistance programs for funding collaborative watershed programs, and suggest policy changes to improve effectiveness of such programs. In a more recent study, Hardy and Koontz (2010) evaluate the institutional performance of two collaborative watershed partnerships – one in an urban land-use environment and the other rural – using an Institutional Analysis and Development (IAD) Framework. They evaluate transaction costs and environmental, social, and policy outputs of the two different groups and concur that different institutional frameworks and different contexts lead to different partnership goals, processes, and outputs.

Several authors have also recognized the role that networks play in aggregating their activities within an organizational field over time in creating these collaborations or partnerships (Genskow & Born, 2006; Godschalk, 1992; Korfmacher, 2000). According to Imperial and Hennessey (2000), every watershed is ‘managed’ by a wide range of governmental and non-governmental actors, whose decisions influence the health and integrity of ecological systems. The challenge for a watershed governance program is to get this portfolio of actors and programs to work together more effectively. Watershed
management should therefore be viewed as an effort to build, manage, and maintain inter-organizational networks; in other words, to develop an institutional ecosystem.

While acknowledging the role of individual and interorganizational networks (Genskow & Born, 2006; Godschalk, 1992; Korfmacher, 2000) in collaborative management of environmental resources generally and watershed partnerships specifically, authors have so far focused on 1) institutional processes and organizational dynamics (Genskow & Born, 2006) that influence the effectiveness of partnership initiatives in watersheds; 2) watershed partnerships as collective action institutions based on the political contracting approach to institutional supply (wherein an analysis of the impact of social, political, economic, and ecological features of watersheds determines the emergence of watershed partnerships) (Lubell et al., 2002); and 3) Institutional Analysis and Development (IAD) framework to identify variables that might affect collective action arrangements such as watershed partnerships or collaborations (Hardy & Koontz, 2010; Lubell, 2003; Sabatier et al., 2005).

To summarize, most of these studies focus on institutional and organizational processes and dynamics based on the [implicit] role of the institutional structures and processes for describing the emergence and the success and/or effectiveness of collaborations/collaborative governance/collaborative watershed partnerships. While recognizing that it is important to understand the watershed governance process through an institutional processes and organizational dynamic lens (where a host of carefully selected factors and variables will determine emergence and outcome of the collaborative governance processes) research in this dissertation focuses on watershed governance and policy implementation through a hermeneutic interpretive lens.
Adaptive Governance

For effective and long-term management of complex SES and/or environmental resources scholars have proposed the concept of adaptive governance. Management of ecosystems and landscapes is complex and cannot be subjected to planning and control by traditional governance arrangements. Adaptive management is a well-accepted environmental management strategy based on continuing learning process dependent on research and ongoing regulatory activities. While adaptive management of resources works within conventional governance systems, requiring an iterative process suited to dynamic systems, adaptive governance is a different type of governance regime that can deal with uncertainty and change, but requires substantial changes in the way natural systems are governed (Garmestani & Benson, 2013; Olsson et al., 2006).

Adaptive governance is dependent upon and operationalized through adaptive management and “incorporates formal institutions, informal groups/networks, and individuals at multiple scales for purposes of collaborative environmental management” (Garmestani & Benson, 2013). Governance provides a vision and direction (e.g. through policy) and management operationalizes this vision (Folke et al. 2005; Mitchell et al., 2015). Learning to manage resilience is a key component of adaptive governance frameworks and requires institutional arrangements that can cultivate this capacity by bridging organizations and government policies. Some of the key components of adaptive governance are presence of social networks (connecting individuals, organizations, and agencies at multiple institutional levels), leadership that facilitates good environmental management, and polycentric institutional arrangements or systems (without a central authority controlling processes). Open and many lines of communication, collaboration,
and cooperation across multiple institutional levels at various scales, and flexible and
collaborative learning-based approaches also characterize adaptive governance (Bodin &
Crona, 2009; Folke et al., 2005; Garmestani & Benson, 2013; Olsson et al., 2006).
Further, Olsson et al. (2006) propose steps or phases that should be considered for
transformation to adaptive governance of SESs. These steps are: 1) preparing the SES for
change, that is, setting it on a desirable trajectory; 2) navigating transition to a new phase;
and 3) building resilience in the new phase towards a new direction. Environmental and
public managers can use these components of adaptive governance and steps for
transformation towards such governance frameworks to effectively manage complex
resource problems during periods of uncertainty and disturbance.

**Understanding Planning, Policy, and Public Administration through Interpretation**

Complexity and pluralism are two important features that characterize any form
of human collaboration and are also integral to the interpretive approach to social inquiry
and governance. These factors strongly condition the outcomes of various policies. The
issue of complexity has key implications for the practice of policy (Wagenaar, 2011).
Policy analysts and theorists have argued that the traditional strategies of centralized, and
managerial way of policymaking and implementation are limited by four aspects of
complexity in policy systems: 1) Unpredictability – the logic of sum is greater than parts
leading to unpredictable and unintended outcomes; 2) feedback – self-propelling
mechanisms that turn into multiple possible outcomes; 3) emergent properties – the
properties that are produced through the interaction of the parts; and 4) indeterminate
outcomes. Policy outcomes are an emergent property of complex networks of actors and
objects. Thus a traditional ‘reductionist’ policy analysis based on positivistic views of the world, functioning under the assumption of ‘one best solution,’ is inherently incompatible with the complex and networked world within which we live and function. Since a complex system is always in flux, and the nature of policy environments within it is essentially interactive, and such systems cannot be studied from an external viewpoint (view from the outside). Knowledge of the system is in principle contextual and participatory; complex systems can in principle not be known in full, and policy makers and analysts cannot hope to be extraneous to the systems in which they intervene (Wagenaar, 2011).

Pluralism means that the world cannot be organized under an overriding external principle, whether it is an epistemology or a universal moral principle. Therefore ‘evidence based’ studies using scientific inquiry, or interpretive studies revealing the interpretation of policy phenomena are one among many ways of viewing and understanding the world (Wagenaar, 2011). Pluralism can be ontological, value-based, or political. Different individuals might have different views of the truth about the world and systems. There can be a plurality of values in a policy situation based on the different conceptions of a desirable social state. Individuals might have different and irreconcilable political goals.

Interpretive forms of policy analysis that are hermeneutic and dialogical are able to address complexity and value-based differences. Innes and Booher (2010) write about interpretive qualitative knowing or phenomenology as an alternative philosophical foundation to the rational model of understanding public policy. They use this philosophical foundation to study collaborative dialogue and collaborative inquiry and
establish a connection between interpretive forms of knowing and research, phenomenology, social construction process, and the concept of collaborative dialogue. Phenomenology leads to a more grounded form of knowledge, taking into consideration the full complexity of a situation and explores the complexity in a way that allows for specific solutions for unique circumstances. The knowledge that is gained within phenomenology is about phenomena as wholes rather than as parts, and the aim is to understand rather than explain. Meaning of phenomena is key and so is the process of meaning making. Reality is comprised of intentions and beliefs, rather than “truth” being out there to be discovered.

Innes and Booher (2010) emphasize that within interpretive modes of research, meaning and belief are basic data. Unlike positivism, the researcher is not a neutral observer. The researcher brings his/her biases to the research, but must be careful about how that might affect his/her perceptions. Intersubjectivity is also key, as the process of gaining knowledge is also dependent on putting oneself in the others’ place. This accounts for subjectivity and personal experience, but also lays the ground for co-creation of reality through a social construction process. This aspect of interpretive or social constructionist viewpoint connects it to the process of collaborative dialogue where meanings are collectively constructed.

The interpretive forms of understanding a phenomenon is based on the uniqueness of the phenomenon itself rather than its similarity with others. Thus, it is not possible to derive universal principles out of studying a situation and transferring it to another. These forms of knowing strive to develop narratives that make sense of the complex dynamics associated with a certain issue or situation in its particular context.
Theory within this view is not contingent on variable-based hypotheses testing, but is building new constructs based on in-depth case analysis and comparison across cases; and looking at the bigger picture to understand the complete phenomenon.

One of the main arguments that Innes and Booher (2010) make is that there are consistencies between the processes of collaboration that foster collaborative dialogue, and the interpretive ways of knowing things. They argue:

Many aspects of collaborative processes mesh well with interpretive ways of knowing. They focus on particular situations rather than look for general principle; participants offer knowledge from their experience as well as from research; they challenge statements of fact and causality; and they build shared meanings around issues. Indeed collaborative dialogue is, more than anything else, a process of negotiating meanings – of problems, of evidence, of strategies, of justice, of fairness, and of the nature of desirable outcomes (p. 22).

In order to deal with complexity and plurality, it is key that the researcher is able to access experiential/hand-on knowledge that is rooted in [local] practices and context. Practices are indeterminate, subject to change, pluralist in context, and emergent in character. Context signifies an ongoing relationship between actors and their environments, which stems from the actors and their intentions and the tasks in which they are engaged. “Instead of passively reacting to the constraints of a particular context, the term “setting” denotes that the actor purposely seeks out those elements of his/her environment that are relevant to the tasks in hand. In this sense the actor “negotiates” his environment by actively designing accommodations to the resistances he encounters” (Wagenaar, 2011, p. 308). Thus practice is always situated, and actors and their settings
participate in particular practices and mutually bring meaning to each other in the course of participation. Therefore, in order to understand social phenomena through an interpretive lens, we (researchers) should be able to situate ourselves and our understanding within the local context and categories of human action (Wagenaar, 2011). Hence an interpretive process opens up space for dialogue and joint exploration (Gadamer, 2004; Innes & Booher, 2003, 2010; Taylor, 1991), where professionals (analysts and researchers) and stakeholders are involved in defining the problems, cogenerating relevant knowledge, and interpreting their experiences (Wagenaar, 2011).

The role of actors and agency is a key component of interpretive forms of research and is also important to the purpose, framework, and design of this research project. In order to further establish the focus of this research project it is first important to understand policy and governance through implementation studies and research traditions.

**Implementation Research**

Gaining a fundamental understanding about policy implementation is an integral part of public policy processes and draws from insights from political science generally or from public administration and public policy in general (Saetren, 2005). This is especially true in the present ‘age of governance’, where implementation research although seemingly out-of-fashion, nevertheless is of critical importance to policy and practice (Hupe, 2014). In the present context of changing state-society interface hinged on a more cooperative and networked approaches, the translation of policies into practice (or what happens after a bill becomes a law) is a challenge and legitimate concern and warrants further exploration (Hupe, 2014; Saetren, 2005).
Policy implementation research has traditionally relied on a command (i.e. top-down) orientation or a governing-elite phenomenon. This approach brought an empiricist perspective to policy implementation, such as the use of probability theory to prove the chances of governmental program outcomes. Recognizing implementation as what happens between policy expectations and (perceived) policy results, O’Toole (2000) argues “[p]olicy implementation is what develops between the establishment of an apparent intention on the part of the government to do something, or to stop doing something, and the ultimate impact on the world of action” (p. 266). However, to move policy to successful and effective implementation, it has been recognized that the traditional top-down perspective has neglected the complexity involved in the process. As deLeon (1999) observed, “they posed a relatively rigorous, empirically based model, although even they admitted that many of their measures were subjective and ordinal, maybe suffering from the analytic tendency of well-meaning, but misplaced precision” (p. 316).

Scholars have identified and widely recognized some of the main issues limiting the traditional policy implementation research approach, mostly relating to the top-down perspective in this approach. These issues can broadly be summarized into four factors. First, changing state-society relations in the past few decades have shifted from unilateral and hierarchical to more reciprocal and less hierarchical, including more reliance on market-based policy instruments. In this context, a top-down model is difficult to use when there is no dominant policy or agency, but rather a multitude of government directives and actors. Second, early implementation studies start from the perspective of the central decision makers and tend to ignore other actors. The assumption is that policy
framers are the key actors and others are impediments, which leads to the neglect of strategic initiatives coming from local implementing officials and private sector. The top-down model also likely ignored or underestimated the strategies used by street-level bureaucrats to get around the central policy, and/or to divert it to their own purposes, to successfully implement policies. Third, there were doubts “about the extent to which policy process could be neatly segmented into discrete stages that progressed sequential progression from agenda setting, through adoption, implementation, and subsequent policy phases (Saetren, 2005, p. 572-573). Also, treating policy as prescience, and presupposing an ability to foresee future contingencies, policy processes were oversimplified through stages that misrepresented the complex and recursive policy process. Early implementation studies had limited ability to predict the outcomes of such complex situations with any certainty. Lastly, top-down policy implementation research has limited ability to look at policy change (deLeon & deLeon, 2002; Sabatier, 2005; Saetren, 2005).

The issues outlined above created a momentum for proponents of an alternative, democratic (i.e. bottom-up) approach as a more fitting line of inquiry for policy implementation (deLeon & deLeon, 2002). These approaches provide a mechanism to move from street-level bureaucrats to the policy makers (i.e. the top) in public and private sectors (Sabatier, 2005). A bottom-up policy implementation research approach, being more realistic and practical, is also seen as a more democratic approach to viewing policy implementation (deLeon & deLeon, 2002). Hupe (2014) proposes some questions that attempt to make sense of complexities in policy implementation and takes into account the idiosyncrasies in implementation decisions and actions. These questions are “How do
researchers address their relationship with the object of their research?”,” “How do researchers handle the fact that policy implementation, almost by definition, implies the involvement of multiple actors on different layers?” and “How do researchers deal with the consequences of the complex, non-technical nature of policy making?” [original emphasis] (Hupe, 2014, p. 168-169). To answer some of these questions the focus of a bottom-up approach is on observed rather than pre-supposed behavior of (implementing) actors. Policy comes with technical intentions, but the political intentions are often unwritten, and local policy implementation actors often act in unforeseen circumstances (Hupe, 2014).

In light of the above discussion, it can be said that policy implementation requires value-loaded judgements and incorporating political dimensions in implementation, which asks for “the incorporation within research of attention to power mechanisms, stakes, values, symbolic aspects and other non-technical dimensions of public policies” (Hupe, 2014, p. 178). A democratic approach to implementation research takes into account discursive forms of policy implementation, participatory aspects of implementation, and the fact that statutory law doesn’t fully dictate administrative action and resulting in a need for interpretation for every law. Public policy scholars have subscribed to interpretive and postpositivist approaches as direct democratic approaches to understand and study policy implementation (deLeon & deLeon, 2002). Interpretive methods presuppose that “we live in a social world characterized by the possibilities of multiple interpretations” (Yanow, 2000, p. 5). Therefore for policy implementation, sense making that entails interpretation is key (Yanow, 2000).
Interpretive Methods

In order to understand the interpretive approach to social inquiry and as a form to understand policy and governance, it is important to put it in context relevant to the mainstream methodological and policy analysis tradition. Positivism, this mainstream philosophical tradition, is not just a set of philosophical principles, but an overall attitude towards knowledge (Hajer & Wagenaar, 2003). This has deep ramifications for methodological principles ranging from the collection of data to the accepted ways of talking about knowledge and policy. The positivist approach to policy analysis and planning involves a narrow methodological perspective, often misunderstanding the relation of knowledge to politics (Fischer, 2003), uses empirical generalizations based on observations, and seeks universal and generalizable laws (empirical generalizations).

From a research perspective, this form of policy analysis is characterized by its deterministic nature, the objectivity of the researcher involved, the assumption that reality is objective, and is largely based on instrumental reasoning. Beyond its methodological focus, positivism has had a dominant influence on the “normative beliefs and habits of governance and policymaking…positivism is above all a practice of policymaking that is deeply rooted in the institutions of modern government” (Hajer & Wagenaar, 2003, p. 6).

Limitations of empirical and positivist forms of policy analysis have given rise to the use of interpretive forms. The term interpretation, derived from the Greek term hermeneutics in the modern context, allows for different interpretive arguments and the choice for a best argument in a particular policy situation. A hermeneutic interpretation process provides the ability of ‘getting inside the head’ of other actors in policy processes. Within hermeneutic research and scholarship there is a constant interplay
among how we view a problem, how we study it, and what are our findings. Each of these elements changes the other elements and is in turn changed by them (Kaplan, 1993).

This viewpoint or tradition is of critical importance when it comes to understanding and interpreting the meaning of policies. Policies are not self-explanatory and each policy is likely to have different meanings for different actors. Meanings therefore are manipulable and ambiguous and a critical element of policy processes is to understand and establish the meaning of policies. Additionally, it is the participants that attach meanings to policies. Thus it is the task of a social scientist and a researcher to identify ‘typifications’ (typical forms) of socially constructed meanings that helps in understanding social reality. These typifications are essential to understand the meaning of a policy. Bevir and Rhodes (2015) define interpretive forms of policy analysis as: “[i]nterpretive political science focuses on the meanings that shape actions and institutions, and the ways in which they do so” (p. 3). Meanings do not just represent people’s beliefs and actions about political phenomena; they also fashion these phenomena. This understanding is the key basis for this research project.

In order to understand policy, policy implementation processes, and the political phenomena within a governance world from an interpretive tradition, phenomenon should be understood in a decentered manner. This means that we need to build “a multifaceted picture of how several actors understand and construct” the phenomena (Bevir & Rhodes, 2003, p. 66). Decenteredness does not discount the role of networks within and outside the traditional realm of the state. While [policy] network forms the
backdrop of the decentered approach, the focus is on practice of governance through actors, who do so by interpreting the situation at hand (Wagenaar, 2011):

To decenter governance is… to focus on the social construction of policy networks through the ability of individuals to create meanings. A decentered approach changes our view of governance. It encourages us to examine the ways in which individuals create, sustain, and modify social life, institutions and policies. It encourages us to recognize that institutional norms – or some logic of modernization – do not fix the actions of the individuals. They arise from the beliefs that people adopt against the background of traditions and in response to dilemmas (p. 98).

This decentered approach to governance is based on interpretation of meanings and can be understood through diverse narratives, traditions, and dilemmas. The assumption under this approach is that networks are constructed because of the ability of the individuals to create meanings together (Bevir & Rhodes, 2003). Moreover, well networked complex systems are more adaptive, creative, and intelligent, as such networks further dialogue and discourse through which individuals begin to develop shared meanings (Innes & Booher, 2003).

Bevir & Rhodes’ (2003, 2006) “distinctive interpretive theory” is well suited for the present research project as it is able to balance “intentionalism (in which meanings spring from the purpose and preferences of the actor) with a broad interpretivism (in which meanings are situated in the larger context of the actor’s environment)” (Wagenaar, 2011, p. 93)
CHAPTER III

LOGIC OF INQUIRY AND CONCEPTUAL FRAMEWORK

*Interpretive inquiry without theory is like an airplane without life. It never gets off the ground* – Hendrik Wagenaar

**Understanding Reality through Positivist/Empirical Approaches**

The fields of policy analysis, planning, and public administration have historically and contemporarily been governed by the concepts of *objectivism* and *instrumental rationality* to bring reason to human affairs. This view is based on the principle of universally applicable rules and procedures and the determination of causal relationships; rationality being the main idea in determining the means to a given end. The objectivist view, as argued by positivists and critical rationalists, is the universal logic of scientific inquiry that governs systems, and can be applied to the logic of public policy as well. Instrumental rationality provides a normative model for behavior to be used in the public policy processes.

Applied to public policy, positivism entails “a belief that policy interventions should be based on causal laws of society and verified by neutral empirical observation” (Dryzek, 1993, p. 218). A causal scheme of determination consisting of policy-
manipulable variables should result in policy sciences, the assumption being that policymakers could recognize and manipulate such variables to a desirable end goal (Dryzek, 1993).

Within positivistic rationality, the logic of analysis in social and policy sciences operates from the epistemological assumptions of empiricism. Patterning the social sciences after physical and natural sciences led to the development of this rigorous empirical focus. The empirical conceptualization of reality and the concept of objectivity govern the ideas regarding separation of facts and values and maintaining ‘value neutrality’ in social sciences research. This empirical focus within the policy sciences has sought to produce ‘useable knowledge’ by maintaining a ‘value critical’ stance. Within this philosophy the pursuit is to produce knowledge that could be empirically organized and replicable through causal generalizations. Empirically based causal knowledge also means keeping normative orientations aside and limiting research emphases to empirical or factual phenomena. This view forms the basis of the technocratic forms of policy analysis that emphasizes identification of the optimal policy for efficiency and effectiveness to achieve policy goals. Thus the key challenge that has remained with public administrators is to translate normative and political issues into technically defined ends (Fischer, 2003).

Morçöl (2012) in his book *Complexity View of Public Policy* discusses the issues of determinism, predictability, and certainty, writing about epistemological bases for positivist science and understanding the world through the framework of determinism. According to this worldview, the discrete entities and events that comprise the world can be aggregated to understand reality. Within this viewpoint, the universe is an entirely
deterministic system and all of its details in the past and future can be known with certainty and in their entirety. From an epistemological standpoint within positivist science, scientists can remove themselves from the object of study and the realities of the issue being studied, and thus are able to gain objective knowledge. In other words, a ‘subject-object distinction’ can be maintained within positivistic forms of sciences/research. Additionally, empirical testing can determine the truthfulness of a piece of knowledge and its correspondence to reality.

Based on positivist science, the assumption within the fields of public policy and administration is that the relationship between cause and effect is linear and proportional and that government actions can have predictable and desired effects. Therefore, based on these deterministic beliefs, planners and policy makers can predict the future of society and plan accordingly. This has implications both for the institution of public administration and for public policy in general. Bureaucratic principles and bureaucratic organization that forms the basis for public administration are traditionally deterministic and linear in their function. Deterministic means that the structure and order given by the hierarchy (cause) implements programs and policies as desired (effect). Linear means there is a proportional relationship between cause and effect, order and implementation. Within public policy, determinism and predictability led to the development of the rational choice framework based on the principles of rational actors and utility maximization. The rational choice framework is based on the assumption of the stability of reality and the predictability of future, and thus social and economic systems tend to move towards stable or equilibrium (Morçon, 2012).
Over the years the reality of the political process and the scholars who acknowledged it (Lindbloom, 1959, 1965; Lindbloom and Cohen, 1979; Wildavsky, 1979) formed the basis of the intellectual movement “beyond objectivism and relativism” that led to the opening up of alternative logics of inquiry in public policy (Dryzek, 1993). The works of Forester (1993), Dryzek (1990), and Fischer (1995) have helped in developing a post-positivist alternative to policy and social sciences.

**Social Constructionist View of the World**

Even before understanding a public policy or a planning issue it is important to conceptualize a system and boundaries of a system. Boundaries are artificially created for analytical purposes. Systems are connected and therefore rarely have real or determinable boundaries. “There are only boundaries of the word, thought, perception, and social agreement – artificial, mental-model boundaries” (Meadows, 2008, p. 97) and it should be kept in mind that “boundaries are our own making, and ...they can and should be reconsidered for each new discussion, problem, and purpose” [emphasis in original] (Meadows, 2008, p. 97). This is a different ontological and epistemological way of thinking about systems.

Several scholars define systems as created through a social construction process. The development of a social system can be credited to the dynamic developments around it, but the role of the participants in the system that actually define it is key (Morçöl, 2012). Gerrits, Van Buuren, and Marks (2009) posit that the “boundaries of policy action systems are defined by the interpretations and representation of agents and that not only what is included in the system, but also how the agents act accordingly are determined by such definitions” (p. 15-16). In other words, they see a
system as a dialogic act, or a social construction process. They further argue that a system’s boundaries are not pre-existing; they in fact are constituted of the judgment of the actors within the system as well as the observers of the system.

Giddens (1984) proposes that the activities of actors shape and define a system and as such they must be situated and reproduced across time and space. Environment is critical in this context as it is within this environment that the system is situated. The activities [of actors] that constitute a system are in relation to the geographic and social environments. There is also a time frame associated with the activities and the patterns of interaction, as for them to be deemed as a system they need to have some amount of durability. A key argument that Giddens makes is that structures (ideas and social constructions) do not exist separately from the individuals’ minds, whereas systems, which are the situated activities of individuals, exist separately. Therefore the rules, values, and principles that govern the society are the structures that individuals or agents have created Morçöl (2012).

Drawing from the interpretive approaches, Healy et al. (2003) argue that policy analysis and planning are deliberative, action-oriented practices within which meanings are socially constructed. Therefore relational dynamics, such as in social networks, actively construct meanings and actions within social contexts.

**Interpretive and Deliberative Policy Analysis**

The interpretive turn in social sciences (policy analysis, public administration, or planning) is characterized by: a) a turn away from a view of social scientific practice that is based on a model of human behavior that is removed from the traits of humans as
researchers; and b) towards a contextualized set of practices and meaning focused analysis. Thus the interpretive turn is largely a move away from the positivist philosophies and towards a meaning focused and person-centered view of social sciences and the world (Yanow & Schwartz-Shea, 2006). Larger forces and changes that were taking place in the society brought about this interpretive turn in social sciences and policy analysis.

The last few decades saw the rise of a ‘network society’ where: “networks constitute the new social morphology of our societies, and the diffusion of network logic substantially modifies the operation and outcomes in process of production, experience, power, and culture” (Castells, 1996, p. 468). Rather than thinking about the impact of a network society for policymaking and politics, Hajer and Wagenaar (2003) suggest that the focus should be on the manifestations of policymaking and politics within such a networked society. In response to the network society, the vocabulary of “governance” emerged in political science and policy science communities. Governance marked a shift away from ‘set solutions’ implemented through top down government and formal political institutions toward a notion of politics that brings in new sites, actors, and views. In addition, societies are complex and values in policy and planning are multiple, fluid, and controversial. Furthermore, the intentional actions of those who are involved in the formulation and implementation of policy can change (Dryzek, 1993). Thus a post-positivist policy analysis based on an interpretive framework is a good fit for the current social and political conditions. An interpretive and deliberative approach to policy analysis is more suited to the current socio-political milieu of a governance and emerging network society (Hajer & Wagenaar, 2003).
Interpretive policy analysis is very context-based and focuses on the meanings situated in the particular contexts. This type of policy analysis is grounded in hermeneutics, phenomenology, and critical theory. Interpretive policy analysis is important as it provides a method to account for and access local knowledge in policy relevant processes. The central idea on which this approach is based is that – *public policies are modes for expression of human meanings*. Meanings are grounded in the life-world of the actors in a policy situation, and are mutually reproduced through interactions between *meanings* and their *artefactual representations* such as texts, physical objects, acts, and practices. It is this situated character of meanings that makes accessing local knowledge an integral part of interpretive policy analysis (Yanow, 2003). Since interpretive policy analysis is both contextual and situated, for a researcher it means immersing oneself in the “concrete problem solving efforts of ordinary actors” (Wagenaar, 2011, p. 10).

Deliberative policy analysis is a group of collective problem solving approaches characterized by: “1) their conscious effort to organize dialogue in situations of policy controversy and prolonged conflict, 2) their practical, hands-on approach to problem solving, and 3) the interpretations of analysis of and acting on the problem at hand” (Wagenaar, 2011, p. 230). Innes and Booher (2003) make a case for collaborative policymaking and solve an intractable and contentious problem through collaborative dialogue. The effect of engaging in a process of collaborative dialogue involves “new ways for players to understand and reframe their identities in relation to a larger picture and in a way contingent on others’ identities” (Innes, 2004, p. 8). Healy et al. (2003) on the other hand views collaborative planning as a “relational view of institutional
capacity.” Healy’s position brings in sensitivity to the larger institutional context as well as preserving the fine gained characteristics (such as meaning and relations) of a collaborative planning tradition.

**Complexity and Public Policy**

As discussed in the Chapter I, public processes are complex in nature. Within policy processes a variety of factors increase process complexity and add to substantive uncertainty: “the limitations of expert knowledge, interactions between scientific knowledge and politics, and interactions between natural and social systems” (Morçöl, 2012, p. 159). The concepts such as non-linearity, emergence, self-organization, and complex adaptive-systems that are central to complexity theory provide key insights that helps to understand and address the limitations of traditional, rationally based policy and public administration processes. Lindbloom’s (1959) work outlined the theoretical and practical limitations of decision-making solely based on rational thinking. This recognition paved the way for multiple scholars to open up space for recognizing that public policies are multilayered systems that are populated by individual and aggregate actors (Meek, 2010; Morçöl, 2010). In the recent times, more sophisticated conceptualizations of public policy go beyond the instrumentalist rational view and account for the complexity in the policy processes. The institutional analysis and development framework (Ostrom 1990, 2005), advocacy coalition framework (Sabatier & Jenkins-Smith, 1993), and network governance theories (Koppenjan & Klijn, 2004) are examples of some approaches that recognize that public policy processes are multi agent, multi actor, and multi layered (Morçöl, 2010; Özer & Şeker, 2013).
The work of Castells (1996) on the *Rise of Network Societies* on networked and information based societies and network organizations as a basic mode of policy making also added currency to the recognition of complexity theory within public processes. The use of network theory in governance also recognized the role of complexity in society and public processes (Innes & Rongerude, 2013).

Morçöl (2010, p. 53) proposes: “Public policies are self-organizing systems that are constituted by the actions of self-conscious policy actors and they coevolve with other systems (natural systems and other policy systems).” Therefore, for public policy analysts the first step is to recognize and understand self-organization and emergence in policy systems. In addition the laws of complex systems are non-reductionist and the structural properties and dynamic processes of each system is unique. The system states cannot be reduced to the characteristics of the constituent parts. The knowledge of complex systems is thus contextual, because of the very nature of the systems set limitations on the predictability and generalizability of behavioral patterns. Since complex systems cannot be known in full, policy analysts and researchers studying such systems cannot hope to be extraneous from the systems while studying or analyzing them (Morçöl, 2012; Wagenaar, 2011).

**Phenomenology, Complexity Theory, and Public Policy**

Chaos theorists have questioned the predictability and future behavior of systems. Nature of systems is indeterministic and future behavior cannot be predicted with certainty. The most important phenomenological argument based on this nature of systems is that “knowledge of a complex system is constricted and conditioned not only
by nonlinearity and indeterminism, but also by the situatedness, or embeddedness, of the observers in the world they observe” (Morçöl, 2012, p. 150).

Phenomenologists argue that knowledge is not generated by a detached mind as Descartes argued (the notion of decontextualized and disembodied knowledge), but is a product of the mind’s being in the world. Phenomenological thinking creates a tension between knowledge being embodied and being contextual at the same time. According to Radder (1996):

On the one hand, human beings, necessarily, keep trying to grasp and control reality by interpreting it with the help of language and by working in and on it through action. On the other, reality – including natural, human, and social reality – appears to be essentially contingent, complex, and variable (p. 1).

Thus, for phenomenologists, there is tension between knowledge in the world and knowledge about the world at the same time.

Heidegger’s position on human knowledge stems out his proposition of situatedness of human beings in relation to other human beings. According to Heidegger, humans experience themselves in the company of others; humans are co-beings (Hummel, 1994). Communication is the medium through which humans share their co-being and common situatedness. This situatedness pertains to being-in-the-world and provides understanding. Interpretation and meaning are derivatives of understanding. Thus, Heidegger’s key thesis is the situatedness of the knower’s knowledge in relation to other knowers, which forms the basis for social constructionist views of scientific knowledge (van Manen, 2014).
Within a similar interpretivist framework, hermeneutics or phenomenological hermeneutics is the interpretation of meaning in communication. Within the hermeneutic perspective “public policies are texts to be read and interpreted” (Morçöl, 2012; p. 169). This philosophical school forms the basis for social constructionist interpretations of policy. The interpretivism/social constructionism framework posits that reality is always subject to personal or social interpretations/constructions.

Heidegger’s philosophy is that meaning and interpretation cannot be separated and depends on the situatedness of human beings. Different human beings will have different interpretations of the meanings of policy/text as they are situated in different societal and temporal contexts. Understanding each other’s meaning will depend on the tacit understanding that comes from people’s common situatedness and embeddedness in the world.

Gadamer extends this notion of hermeneutical understanding. According to Gadamer, people can understand each other’s meanings only through participating in authentic dialogue (Gadamer, 2004). An observer is situated within the observed world and the dialogue with nature is successful only when it is carried out within nature (Morçöl, 2012):

Whatever reality may mean, it always corresponds to an active intellectual construction. The descriptions presented by science can no longer be disentangled from our questioning activity and therefore can no longer be attributed to some omniscient being (p. 177).
Governance and Interpretation

Governance is the process of creating conditions for ordered rules and collective action through the structures and processes through which people in societies make decisions and share power, and can be institutionalized or expressed through more subtle and indirect forms of interactions between actors regarding decisions of accessing resources and policy implementation and change (Lebel et al., 2006). Within the broader concept of governance, much has been written about interrelated networks of actors. Networks are structures of interdependence involving multiple actors or organizations that extend beyond the formally established linkages and policy-legitimated ties (O’Toole, 1997). Actors operate through associational networks, and while some networks are formally created, there are also informal or ad hoc in nature. The idea of a network society draws attention to the complex pattern of social interaction within policy processes.

Networks play a key role in aggregating their activities within an organizational field over time in creating collaborations or partnerships (Genskow & Born, 2006). A wide range of governmental and non-governmental actors, whose decisions influence the health and integrity of ecological systems, manages every watershed (Imperial & Hennessey, 2000). In addition, several contextual factors give rise to collaborative watershed management such as – socioeconomic conditions, civic community conditions, ecological conditions, and government institutions (Sabatier et al., 2005). This implies that nature of the watershed management approach depends heavily on the context out of which they emerge.
Complexity and pluralism characterize any form of human collaboration, strongly condition the outcomes of various policies, and need to be accounted for in social inquiry (Wagenaar, 2011). Policy scholars argue that aspects of complexity limit the traditional strategies of centralized, managerial way of policymaking and implementation. Interpretive approaches that are hermeneutic and dialogical are able to address complexity and value-based differences by accessing the experiential/hand-on knowledge that is rooted in [local] practices and context. Practices are indeterminate, subject to change, pluralist in context, and emergent in character. Context signifies an ongoing relationship between actors and their environments, which stems from the tasks in which they are engaged (Wagenaar, 2011). A hermeneutic interpretation process provides the ability of ‘getting inside the head’ of other actors.

According to Bevir and Rhodes (2004), “interpretive approaches to policy studies focus on meanings that shape actions and institutions, and the ways in which they do so” (p. 130). Networks are constructed because of the ability of the individuals to create meanings (Bevir & Rhodes, 2003). In order to understand a networked governance world from an interpretive tradition, we need to build “a multifaceted picture of how several actors understand and construct” the phenomena (Bevir & Rhodes, 2003, p. 66). Moreover, well networked complex systems are more adaptive, creative, and intelligent as such networks furthers dialogue and discourse through which individuals begin to develop shared understandings (Innes & Booher, 2003).

**Hermeneutics and Phenomenology**

Martin Heidegger and Hans-Georg Gadamer are considered the principal scholars who contributed to the development of hermeneutic phenomenology, although...
Gadamer’s stand on hermeneutics was a little different than Heidegger’s. Their philosophy falls under the stream of philosophical hermeneutics (or hermeneutic philosophy); the other two streams being classical hermeneutic theory, and critical hermeneutics. Friedrich Schleiermacher offered the view of hermeneutics as a general theory of textual interpretation and understanding. He is credited with the transformation of hermeneutics from a technique to a theory. His main argument was that the goal of interpretation is to uncover the true meaning of the text as intended by the author. The two main aspects of Schleiermacher’s interpretation are a) a text has to be understood fully in the context of the language - it provides “the structures within which…thought operates” (Palmer, 1969, p. 88-89); and b) effective reconstruction of an author’s mental and creative processes in order to develop a complete understanding of the text. Dilthey (1976) extended Schleiermacher’s theory to the interpretation of social meaning in legal, economic and other similar systems.

Heidegger’s hermeneutic philosophy was based on an existential-ontological conception of hermeneutics, mainly coming out of his concept of Dasein (being there). He states that “understanding” is a fundamental category of human existence. Philosophical hermeneutics thus is about the deep exploration of philosophical issues around interpretation. The main difference between the two streams of hermeneutics is that while classical hermeneutics is concerned with the theory of understanding and interpretation (of texts), philosophical hermeneutics involves the deep philosophical exploration in each and every act of interpretation. The distinction between interpretation and understanding as posited by earlier hermeneutics no longer remains within philosophical hermeneutics.
Gadamer develops a systematic philosophy of hermeneutics. He argues against the idea of separation of the text from the reader; in fact hermeneutics means placing the interpretation of texts in the context of one’s own social-historical existence. By linking hermeneutics to human life and existence, Gadamer essentially emphasizes on: a) the role of language and the nature of questioning and human conversation, in other words interpretation being a dialogue between the text and the interpreter; and b) the importance of “tradition” and the significance of “prejudice” within human understanding and the act of interpretation (Prasad, 2002; van Manen, 2014).

**Interpretation and Hermeneutics**

A key phenomenological argument to describe the indeterministic nature of systems is that “knowledge of a complex system is constricted and conditioned not only by nonlinearity and indeterminism, but also by the situatedness, or embeddedness, of the observers in the world they observe” (Morçöl, 2012; p. 150). Heidegger’s key thesis is that the situatedness of the knower’s knowledge is in relation to other knowers, which is at the heart of phenomenological inquiry. Understanding each other’s meaning will depend on the tacit understanding that comes from people’s common situatedness and embeddedness in the world. Gadamer however, goes a step further and says that hermeneutical understanding can take place through authentic dialogue, through which one can understand the others’ meaning.

**Tradition, Authority, and Prejudice**

Gadamer critiques the over-reliance upon rationality in the quest for self-authenticating truth and indubitable knowledge. He introduces “tradition” in an effort to
establish a new method for grounding knowledge. It is through tradition that all cultural activity is advanced and maintained. Gadamer argues that tradition “has a justification that lies beyond the rational grounding and in large measures determines our institutions and attitudes” (Lawn, 2006, p. 35). Tradition, in the original and conventional sense of the word means ‘to hand on,’ which means to pass on or transmit something from generation to generation. Gadamer’s meaning of tradition takes a different direction. According to him, the skills and craft that are passed on from generation to generation, are not simply repeated, but are constantly being changed and modified, reworked and reinterpreted. Shils (1981) articulates it in the following way:

Constellations of symbols, clusters of images, are received and modified. They change in the process of transmission as interpretations are made of the tradition presented; they change also while they are in the possession of their recipients. This chain of transmitted variants is also called a tradition…(p.13)

Tradition is fundamental force within culture, and thus beliefs and rationality are also part of the wider contexts of tradition. Extending this argument to language or the key element of everyday world (or life world), Gadamer says that, “tradition is not simply a process that experiences teaches us to know and govern; it is language.” (Lawn, 2006, p. 36). Thus, reason and tradition are not opponents, but reason might itself be a part of tradition. Tradition cannot be made an object of investigation as we are always within it.

Gadamer doesn’t define authority in the way it has been used commonly, which can be seen as opposite to reason and freedom. Authority is commonly associated in social life with power and domination. Gadamer defines authority in terms of ‘genuine
authority’ that has its own legitimacy. According to Gadamer, “authority… properly understood, has nothing to do with blind obedience to commands. Indeed authority has to do not with obedience, but with knowledge” (Gadamer, 2004, p. 279). Authority or genuine authority is not by the virtue of possessing social power, but the ability to open up questions and make certain matters crucial in a genuine quest for knowledge. Thus genuine authority is the ability to open up questions. Seen from this perspective it is the ability to open up questions by the text that is more important than the textual producer. Although knowledge is vested in individuals, the source of authority is knowledge (Lawn, 2006; van Manen, 2014).

Gadamer emphasizes the explication of prejudice as human knowledge. Prejudice can be understood as pre-judgments, and Gadamer argues that all knowledge is subject to prejudice. Prejudice is deeply embedded in humans through their historical consciousness, and as such human understanding cannot be controlled through methods and rules. Gadamer’s main argument is that by virtue of our historical consciousness we have pre-judgments; these pre-reflective involvements with the world stand behind our judgment and make reasoning possible (Lawn, 2006; van Manen, 2014).

Thus, based on Gadamer’s conception of tradition, authority, and prejudice method or rules cannot control human understanding. According to hermeneutical philosophy, all human understanding is interpretation and occurs through dialogue. Philosophical hermeneutics in general and Gadamer’s ideas in particular point out that subjects and objects are indivisible. Hermeneutics, which is the art of interpretation, is central to all forms of understanding and this viewpoint is radically different form a view of the world that is regulated by methods. Hermeneutics reveals that all human
understanding is based on interpretation. Truth is not absolute, and the truths of experience enshrined within common cultural traditions shouldn’t be ignored. Truth can never be achieved, but what we gain from a hermeneutic tradition is a constant quest to gain deeper understanding. Gadamer cautions that no matter how careful one is about the method used to study the world or phenomena within it, one must always remember that it is being seen from a particular human framework or dimension (Lawn, 2006).

**Dialogue**

Gadamer asserts “understanding is always part of a dialogue, hence, is dialogical in nature” (Lawn, 2006, p. 70). Linking dialogue to truth and authority, Gadamer argues that genuine authority provides the conditions for the emergence of truth, and whatever truth might be; it can only emerge through dialogue. Lack of structure and incompleteness are two key aspects associated with genuine dialogue. “What emerges [in a dialogue] is neither mine nor yours and hence so far transcends the interlocutors’ subjective opinions that even the person leading the conversation knows that he doesn’t know” (Gadamer, 2004, p. 368). Thus a genuine conversation or dialogues moves in unpredictable directions, is unplanned, and always reveals something about the participants. According to Gadamer (Lawn, 2006):

> Dialogue is the very opposite of self-reflexive, monadic, introspective thought. It is intrinsically spoken (as opposed to written or merely thought) and it takes place in a public forum…In the genuine dialogue the participants change as initial assumptions are challenged, modified, held up to scrutiny in the public court of appeal, in the dialogue itself…prejudices can arise to the fore in dialogue as they are frequently challenged and surprised in dialogical encounters (p. 71).
Gadamer’s epistemological claim is that we cannot understand the world as detached observers. This claim is radical and has reformulated the process of hermeneutic explanation and has immediate relevance for researchers and public policy analysts (Wagenaar, 2011). Gadamer’s epistemological claim is also based on his central thesis that *all understanding is essentially dialogical* (Lawn, 2006). Researchers understand a topic within their own historical and cultural consciousness, which is also a condition for understanding. Wagenaar (2011) explains Gadamer’s position on understanding as:

Understanding…is always the gradual, reciprocal influencing of the researcher’s position on the one hand, and the nature of the object of explanation on the other…The researcher, lets himself be ‘interpellated’ by the object of explanation, whereby he gradually comes to see not only the limits of his prior understanding but also the possibilities for productively developing it (p. 264).

Thus, in an interpretive research a collective dialogic process between the researcher and the data is always going on, which constantly leads to the reformulation of the understanding on the basis of confrontation with the data. This forces the researcher to see things in a new light (Lawn, 2006; Wagenaar, 2011).

**Between Hermeneutics and Post-Structuralism**

Bevir and Rhodes (2003) critique the use of classical hermeneutical tradition to the interpretation of public policy. Their critiques are part of the set of scholars (Dryzek, 1982; Hajer & Wagenaar, 2003) who argue that this view of interpretive policy analysis suffers from meaning realism, which means that meaning is objectified in such analysis. Bevir and Rhodes (2003) bring in a deeper philosophical context to interpretation or
interpretive policy analysis. They call it the “third way” between hermeneutics and post-structuralism. They use the three concepts of – tradition, dilemma, and decenteredness to illustrate their philosophical viewpoint on interpretation.

Bevir and Rhodes (2003) use the concept of tradition to strike a balance between agency and determinism for the purpose of understanding intention and meaning within the world of politics. According to the authors,

This view of agency suggests that we see social context not as episteme, languages or discourses, but as traditions. The concepts of episteme, language and discourse typically invoke social structures that fix individual acts and exist independently of them. In contrast, the notion of tradition implies that the relevant social context is one in which subjects are born, which then acts as the background to their beliefs and actions without fixing them. Traditions allow for the possibility of subjects adapting, developing and even rejecting much of their heritage (p. 32).

However, Bevir and Rhodes (2003) emphasize that traditions are neither immovable superstructures nor cultural prisons that determine people’s beliefs and actions. The initial influence of traditions shape people’s later actions. Thus traditions are “contingent products of the way in which people develop specific beliefs, preference, and actions” (p. 34).

Traditions are subject to change as well and that is where dilemma comes in. Humans are subject to dilemmas arising from theoretical and moral reflection from life experiences. Both tradition and dilemma are a decentered way of looking at things. This
is the essence of Bevir and Rhodes’ (2003) decentered approach of looking at interpretivism in understanding political phenomena.

Shedding further light on a decentered approach to study political phenomena, Bevir and Rhodes (2003) add that we “build a multifaceted picture of how several actors understand and construct” the phenomenon. In a fundamentally pluralistic works, instead of looking at the overarching truth, we should be looking for and understanding “narratives about how (…) people understand what they are doing in networks, where these understandings usually both overlap and conflict with one another” (Yanow, 2003, p. 66). The following section presents the conceptual framework developed for conducting this research.

Conceptual Framework for the Study

Figure 3.1 shows the governance structure in the watershed, created through an examination of extant literature in the field in combination with the documents reviewed (for data analysis).

Figure 3.1 shows that there is the formal regulatory structure that is in play in the watershed and there are the various local initiatives and advocacy actions. The regulatory structure creates the formal structure for policy implementation. However, the actual implementation of policy and creations of plans and programs in the watershed is carried out by a complex governance network of various actors, stakeholders, and local leadership representing businesses, nonprofit organizations, local watershed groups, educational institutions, and local government agencies, which took shape on an ‘as needs’ basis.
Further, when a policy is legislated it is assumed that it will have a singular meaning. However, a policy assumes additional meanings in the process of implementation. Knowing these additional meanings that a policy assumes and conveys is key to understanding governance. This process reflects how the construction of multiple meanings via interpretations evolves over time through the process of implementation, and how the meaning of the resource itself shifts through the process of governance.
Figure 3.2: Meaning-carrying artifacts and interpretive communities (Source: Yanow, 1997)

Therefore, in order to conduct this research, I focused on accessing the meaning-making activities of actors involved in governance processes. Meanings are embedded in various policy-related artifacts such as narratives of the stakeholders, language, acts, and policy texts. However, since different interpretive communities associate different meanings with policies (embedded in artifacts and can be accessed through them) the key task is to identify the various communities and identify the meanings that they associate with the policy. The methodological framework used to conduct this research is presented in the next chapter.
CHAPTER IV

METHODS AND ANALYSIS FRAMEWORK

*Scientism mistakenly sends us to the laboratory, where we tend to ignore rather than address interpretive problems of application and implementation. Learning-systems notions threaten to reduce the world to a population or organizations or system – rather than persons – and threaten to neglect political life altogether (John Forester, 1993, p. 54).*

**Introduction**

This chapter presents the study research design including the methods and analysis framework. It includes an overview of the three research approaches used, the methodological framework (research design framework) based on the approaches, the specific methods of data collection under each approach, a description of the analysis framework, some potential limitations of the methods and scope of analysis, and finally the evaluative criteria for interpretive studies. This chapter aims to present an outline and description of the design and methods used to conduct this study so that readers have a clear understanding of the conception, design, and execution of the study, along with the evaluative standards that can be used to assess the study.
Research Design

This study uses a combination of three approaches: interpretive phenomenological analysis, ethnography, and social network mapping. Due to its overall interpretive nature, the conception, design, and execution of this study didn’t follow the traditional stepwise course of a research design, where a research is designed first and then data is collected and analyzed. Instead, design and methodology for conducting this study was developed through a fluid and iterative process of concept development and exploration. In other words, this study is characterized by a flexible research design, the details emerging during the process of the project (Robson, 2007). Data collection and analysis were intertwined throughout the various steps of the research process, starting from the conceptual exploration of the study to the development of the research design. The various elements of the design and data collection and analysis methods are described separately here for the sake of clarity.

Because of the flexible and exploratory nature of this study the focus was on maintaining sensitivity towards the form of data and to follow the leads that emerged from it (Charmaz, 2006). In other words, the data and the method of analysis used depended on the context, availability, and type of data in the field. Working from an interpretive phenomenological perspective, I started with a set of informed “hunches” rather than hypotheses to test (Yanow & Shwartz-Shea, 2006, p. xvi) and approached my data “less as being accessed … as if they had some ontologically prior, independent existence,” but more as “co-generated” through interviews and physical and non-verbal exchanges and dialogue between myself (the researcher) and the research participants (Yanow & Shwartz-Shea, 2006, p. 115). Remaining true to the nature of the study and the
questions of inquiry, I started with observations in the field, to build a context for accessing local knowledge, and to gain some insight into the complexity and conceptuality of the governance process for the Cuyahoga River Watershed (Luton, 2010; Yanow, 2000). Without adopting a pre-determined design commitment, i.e. maintaining the flexibility to account for the unexpected turns and modifying the questions and assumptions based on the observations and personal and textural accounts, I initiated a dialogue between the theoretical assumptions and the data (Smith et al., 2009; Wagenaar, 2011). Data was generated using multiple methods, where I collaboratively reflected on the “meaning and sense-making in a particular context” (Smith et al., 2009, p. 45) along with the people who share a particular experience – the governance actors – and by asking the question: “how does this speak to the phenomenon?” (van Manen, 2014, p. 312).

Conducting an interpretive research is a double-hermeneutic activity for researchers, where they play a dual role (Smith et al., 2009). Additionally, within phenomenology researchers draw present understanding from prior knowledge derived from education, experience, and background. These two perspectives combined require explicit reflexivity on the part of the researcher while conducting the research and also while analyzing and writing. This perspective is inherent in the interpretive nature of this research and the intersubjective nature of “co-generation” or “co-creation” of meaning between the researcher and the participants (Yanow, 2009).

The process of double hermeneutics, along with the iterative process of data generation and analysis, involves what Yanow (2009) characterizes as four “interpretive moments.” First, the researcher interprets the first-hand experiences of the actors
involved with the phenomena. The second moment is when the researcher interprets the actors’ interpretations “as we participate with them, talk with them, interact with and observe them, and read (literally and figuratively) their documents and other research-relevant artifacts (Yanow, 2009, p. 278).” The third moment occurs during the deskwork phase when the notes and findings are read, reread, and analyzed by the researcher to craft a fieldwork and analysis narrative. In the fourth moment, a reader reads and interprets a researcher’s work. Throughout the research process I constantly engaged in trying to make sense of the participant meanings (through interviews, observations, and textural analysis) as they make sense of the phenomena (i.e. governance) through a dialogic process and systematically reconciling this sense and meaning making activity with the broader theoretical/analytical framework of the study itself.

The iterative process of data generation and analysis involved overlapping steps between study conceptualization, fieldwork, deskwork, and text work. Data generation through fieldwork involved carrying out direct and participant observations, gathering and analyzing relevant documents, and conducting informal and in-depth interviews. This process paralleled and overlapped with the process of deskwork, i.e. conceptualizing the inquiry and coming up with the research questions, as well as with the process of text work, which involves analyzing the information generated through fieldwork and drawing parallels with the overall conceptual and theoretical context. Analysis of the data and going back to the actors that I interviewed informally as well as formally continued while writing the final thesis document. Thus, this research has been carried out in “overlapping sequences of identifying puzzles, developing research questions, accessing and generating data, exploring various meanings of multiple interpretations, and refining
and communicating” the interpretations and results (Hendricks, 2007, p. 282). The three methodological approaches used in the study are described below.

**Methods**

**Ethnography**

Ethnography is well suited as an interpretive approach for the study of governance, as we “build a multifaceted picture of how the several actors understand and construct” a phenomenon (Bevir & Rhodes, 2003, p. 66). An ethnographic approach allows the researcher “to get below and behind the surface of official accounts by providing texture, depth, and nuance” by letting the participants “explain the meaning of their actions, providing insights that can only come from the main characters involved in a story” (Bevir & Rhodes, 2006, p. 101). This process involves being part of the social setting of these individuals, groups, and communities, developing relations with people and observing all the while during participation (Emerson, Fretz, & Shaw, 1995). Based on Bevir and Rhodes’ (2003) contention that ethnographic analysis for interpreting governance shouldn’t be restricted to a bottom-up analysis, in this study I included the various levels of administration in the various government agencies, elected officials, city and county planners, and other similar actors along with the community stakeholders and leaders and watershed managers. This combination of top-down and bottom-up analysis in ethnography has the merit of not only allowing access to local knowledge, but also the ability to interactively arrive at the situated specificity of meaning, as all the governance actors/stakeholders have an influence on the manner in which issues present themselves to each of the actors/actor groups and shape the constraints and possibilities of addressing the policy issues (Wagenaar, 2011).
Following a hermeneutic tradition, it is important to be attuned to a dialogical notion of the meaning that emerges from such observations. Since policy-related actors together as a group hold policy-relevant knowledge, such knowledge and learning is always relational and social and rooted in a context of mutual interactions (Yanow, 2003). This means focusing on “how meaning is constructed in the interaction between agents and between agents and the world in everyday situations” (Wagenaar, 2011, p. 41) during the process of conducting ethnography. This extends to textural or document analysis as well.

Since texts are not objective facts and are created to fulfill their official roles and follow specific conventions, there are embedded meanings assumed within texts (Charmaz, 2006). Therefore, the process of analyzing relevant documents (policy texts or otherwise) can also be an interpretive activity. In order to get a handle on the reconstruction of perspectives of actors and groups that are involved in wider context from which policy derives its meaning, finding relevant information in grey literature (newspapers, magazines, agency reports, newsletters, government documents, etc.) is the first step. These documents emphasize that policies play a key role in “public expression, inculcation and validation of values, beliefs, and feelings, as well as the distribution of material goods” (Yanow, 1997, p. 22). The documents that were analyzed were selected purposively. A key to interpretive forms of policy research is to understand the contrasts between the policy meanings as intended by the policymakers – “authored texts” – and the – “constructed texts” – which reflect the meanings that the policy-relevant local groups make of them (Yanow, 2000, p. 9). This helps in going beyond just what the document or text is saying and relating it to the abstract level theoretical concepts and
arguments that emerge out of the analysis and interpretation of evidence collected through other methods such as interviews and observations.

**Interpretive Phenomenological Analysis**

Phenomenology in general, and hermeneutics in particular, is a form of inquiry that is associated with interpretive practice (Denzin & Lincoln, 1998). Phenomenological research is concerned with experiential meanings and a fresh, concrete, and rich description of a phenomenon as is lived or experienced by people (Finlay, 2009). From the perspective of hermeneutical philosophy, interpreting meanings generated by human beings, either individually and/or collectively, is key. According to Gadamer, hermeneutic understanding should be “an interaction between the historically grounded intentions of the authors of a text or an artifact and the historically grounded interpretation of the reader” (Morçöl, 2002, p. 101). Hermeneutic philosophers such as Heidegger, Gadamer, and Ricoeur argue that we are embedded in a world of language and social relationships, and all our understanding is historically based. Thus the meaning of a phenomenological description lies in its interpretation, which is not an additional procedure. It is by virtue of our very being-in-the-world (Finlay, 2009).

Yanow and Shwartz-Shea (2006) contend that the main objective of interpretive research is to understand the “meaning-making activity of human actors” (p. xii). In that sense it is different from other qualitative research methods that aim to make generalizations, and are thus positivistic in nature. The main purpose of interpretive research is to understand the meanings created by the various actors within their respective contexts, not to generalize them. A hermeneutic meaning is the default setting for interpretive analysis by “clarifying a puzzling phenomenon by discovering its “real”
or underlying meaning” (Wagenaar, 2011, p. 41). Rooted in a phenomenological legacy, an interpretive analysis based on hermeneutic meaning is about the commonsense understanding of individuals through their ideas and experiences emerging from their perceptions and interpretations (Wagenaar, 2011).

Interpretive phenomenological analysis (IPA) is the research method or approach used in this study to conduct and analyze the interview conducted. As Smith et al. (2009) point out, the justification for choosing IPA for researchers should be its consistency with the epistemological position of their research question. This is based on the assumption that the data that we collect can ultimately answer our research questions. Within IPA the focus is on “people’s experiences and/or understandings of particular phenomena” (Smith et al., 2009, p. 46). IPA is a well-suited method by which to explore in-depth the interpretation of the meanings that actors associate with various policies governing the watershed and how that shapes their collaborative actions and the networks they create, what comes out of the collaborations that shapes the outcomes, and how the experience of the collaborations shape the understanding of the watershed/resource as a whole.

An issue that is commonly associated with the legacy of phenomenology and its implications for interpretive research is “how to move from grasping individual consciousness to understanding of the intersubjective features of the world” (Wagenaar, 2011, p. 43)? For resolving this issue, a twofold solution is suggested. Understanding that a commonality among individuals is “that they project some form of transcendental meaning that informs subjective acts of consciousness and that takes us beyond individual experience” (Wagenaar, 2011, p. 44). That is, the “communities of meanings” – groups of people that emerge “relevant to the policy issue that create or interpret”
policies and policy related artifacts, and their discourses are derived from shared or similar experiences, thought, speech, and practice and their meanings (Yanow, 2000, p. 20). The other part of the solution comes from the work of Alfred Schütz, who takes a sociological view and shifts emphasis from the experience of an individual to the structures that give rise to these experiences. Subjective experiences within individuals are made possible only by the intersubjective features of social reality. In other words, the subjective and intersubjective experiences “bring each other into being” (Wagenaar, 2011, p. 44). These solutions help in resolving the issue of moving from individual experience to the world by providing frameworks for understanding.

**Network Mapping**

Governance of complex SESs involves multiple actors who are involved in varying degrees in the governing processes. However, joint management and governance is difficult to achieve in practice because of socio-political complexities that act as barriers to collaboration. Social networks have been identified as a common and important denominator, where multiple actors and stakeholders are involved to deal with natural resource dilemmas (Bodin & Crona, 2009). Social network analysis (SNA) has proven to be an effective tool for analysis and insights regarding management and governance of environmental and water resources (Bodin & Crona, 2009; Bodin, Crona, & Ernstson, 2006; Mandarano, 2009). A network perspective has also proven to be useful in the study of resilience of SESs (Janssen et al., 2006). Sophisticated quantitative social network analysis have rendered influential insights into the structure of networks, influence of network structure on governance processes and outcomes (Bodin & Crona, 2009), the role of social networks in providing ecosystem services in watershed
governance (Rathwell & Peterson, 2012), and the relationship between network structure and network performance (Janssen et al., 2006). Vance-Borland and Holley (2011) contend that most of the SNA research in natural resource management is done by academic research scientists, and so far only Prell et al (2009) focus their work in natural resource management on interventions based on SNA or applied SNA.

SNA has been used effectively as a diagnostic tool within the fields of community based natural resource management, community development, and rural development (Clark, 2006). Network mapping or visualization of networks is helpful for practitioners and community engaged researchers to establish new activities in unfamiliar locations and to gain “knowledge of the existing social system or local network, which is necessary to understand the structure and characteristics of the relationships local people and institutions have with their surroundings” (Clark, 2006, p. 4). Unlike closed institutional setting, watershed governance (for watersheds as complex SESs) consist of complex socio-institutional frameworks and processes where a whole host of actors from different communities of practice and organizational nature and affiliations interact at local, regional, and national levels (Clark, 2006). Therefore, network mapping can provide a snapshot of the “bigger picture” of how the network is structured and can help demonstrate the relationship between various actors and identify the most influential actors.

Since this research study is exploratory and interpretive in nature, the data generation process (interviews, observations, and document reviews) is characterized by engagement with the actors involved in the governance of the Cuyahoga watershed. Hence, the network mapping exercise in this study involves the use of secondary data
(via document review) to not only explore the network structure, but also accounts for “qualitative observations about what is going on within a network” (Crossley, 2009, p. 21). Although there are merits to conducting a mixed-methods SNA (using both qualitative and quantitative methods), and collecting network data through multiple tools such as interviews, surveys, and secondary documents, for this study, staying true to the process of an interpretive phenomenological analysis involved focusing on a meaning centric dialogic process during interviews and not venturing into name-generator (who talks to whom) type of network questions. Therefore the data for the network analysis was gathered through review of secondary documents.

I started generating some initial network maps from archival reports and documents that helped me identify key actors in the local networks and actors to consult during the initial stages of my study development. The visual materials that I generated were also a good starting point for conversations with key actors to discuss their roles in program and policy implementation and their relationship with other actors. The visual display of the SNA map and the incorporation of qualitative processes have been demonstrated as effective tools to get a sense of local understanding and social capital within groups that are studied. The visual displays of SNA are good starting points to further interrogate social connectivity and capacity among watershed managers, community stewards, public officials, and other watershed stakeholders (Beilin et al., 2013). The methodological approaches, the data collection and analysis tools used for each are illustrated in Figure 4.1.
Data Collection

A combination of document review, direct and participant observations, and conversational and in-depth interviews were used for data generation (Figure 4.1).

Yanow (2000) refers to the first three instruments collectively as participant observation or ethnography. As noted before, for this research the interviews were carried out through the IPA strategy. Since any single source of information is unlikely to provide a full picture of the phenomenon under study, a combination of sources of information or evidence is useful. Since each source has its own strengths and weaknesses, using a combination ensured that weaknesses of one approach are offset by the strengths of other,
and the overall validity of the data increases (Patton, 1990). Yanow (2000) points out that “data collection” within interpretive research isn’t the same as it is in an experimental setting. Within interpretive forms of research, data are not separated from their sources; in fact data collection requires the sources to be treated in their contexts. “The “data” for interpretive analysis are the words, symbolic objects, and the acts of policy-relevant actors along with the policy texts, plus the meanings these artifacts have for them” (Yanow, 2000, p. 27). Thus, what the researcher collects is the interpretation – through dialogue with the actors and the policy texts, and the observations – of actors, documents, and situations (Prasad, 2002; Yanow, 2000).

The first step was to identify the various policies, plans, and program documents. This led to the identification of various groups and communities of practice associated with various aspects of policies and their interpretation and implementation. This also led to the identification of the various forms and venues through which interactions happen, ideas are exchanged, and collaborations are forged.

**Document Review**

Document analysis, as outlined by Yanow (2000) is the first step in interpretive policy analysis. Following this interpretive tradition, the first step of the data collection process in this study consisted of document analysis or review. Document analysis is a systematic procedure for reviewing or evaluating documents and is particularly suited to qualitative case studies that are intense and produce rich descriptions of a single phenomenon, event, or organization (Bowen, 2009; Yin, 2009). This process can include, but is not limited to 1) program records from organizations, announcements, and minutes of meetings; 2) memoranda and correspondence, personal diaries, calendar, notes, etc.; 3)
official publication and reports, proposals, and other internal documents; and 4) formal studies or evaluations (Patton, 1990; Yin, 2009).

Yin (2009) cautions that due to the abundance of materials available through Internet searches, it can be overwhelming and time consuming to review every single one of them. Therefore one should start with the documents that are most central to the inquiry. As the overall purpose of this study is to study governance within the Cuyahoga watershed, and as the watershed is one of the 43 AOCs, the RAP Stage-1 report (June, 1992) and the website of the RAP was taken as a starting point for finding relevant documents for the purpose of a systematic review. Since the watershed is federally regulated for water pollution mitigation and control, and has a corresponding institutional implementation structure, the policy, program, and planning documents pertaining to this institutional implementation constituted a major portion of the document analysis process. The key purposes that this process of document analysis served for the next steps of data collection were – 1) identification of key actors that were a part of in-depth interviews; 2) identification of boundaries of interpretive communities based on initial and provisional assumptions (Yanow, 2000); 3) material for the creation of a social ecological system profile and analysis of the Cuyahoga River watershed; and 4) data for network mapping.

Within document analysis, a systematic review requires that “data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge” (Bowen, 2009; p. 27). A systematic review was undertaken for the Remedial Action Plan (RAP) studies and reports for the Cuyahoga River Areas of Concern (AOCs), Total Maximum Daily Use (TMDL) reports, the sub-watershed Balanced Growth...
Program plans (BGPs), the Watershed Action Plans (WAPs) for the tributary watersheds, and the Water Quality Management plans (Clean Water Act, Section 208), Towpath Trail plans, and historic planning documents and reports from agencies. Some of the other documents that were reviewed are the annual reports of the organizations working on various projects on the Cuyahoga; reports from the planning initiatives such as the Cuyahoga Valley initiative, Corridor Management Plan and plan for the Towpath Trail in the North Cuyahoga Valley Corridor, National Park Service Reports for the Cuyahoga Valley National Park and factsheets and newsletters from the state and local government agency websites (see appendices A, B, and C for a complete list of the documents).

**Observations**

Having the advantage of residing in Cleveland and very close to the watershed, I had the opportunity for carrying out multiple observations of public meetings, interest group meetings, board meetings of various government agencies, community meetings, and watershed-based planning and review meetings. Additional observations were made during several site visits, field visits, and tours carried out by key organizational actors who are actively engaged with watershed planning and program activities. Observations can have varying degree of participation, from being a passive observer to an active participant (Yanow, 2000; Yin, 2009). I mostly engaged in a range of direct to participant observation these meetings and activities. Participant observation is the “fine art of hanging out” while the researcher attempts to “interpret observations and experiences systematically by looking at sociocultural patterns.” Additionally, Denzin and Lincoln (2005, p. 643) argue that “there is no pure, objective, detached observation; the effects of the observers’ presence can never be erased.” Therefore, even in the situations and
meetings where I didn’t participate actively, my presence in the situations and being part of the meetings made me a participant.

Carrying out observations and being part of an observation setting also involves an act of interpretation. Within an ethnographic data collection method such as conducting observations and writing fieldnotes, the process of interpretation involved figuring out the interplay between individual actors, beliefs, and social contexts (Wagenaar, 2011). As noted earlier, it can be assumed that policy is legislated with a single meaning, but accumulates and conveys additional meanings as it is implemented over time. The purpose of a researcher in an interpretive study is to tease out the contrasts and differences between the “authored” texts and the meanings that the governance actors construct from these texts (Yanow, 1996, 2000) and observations play a key role in this process. Through effective observations the meanings that the interpretive communities associate with polices can be discerned, as well as the points of conflicts and values. This was the formal part of observations that I conducted and included figuring out the interpretive communities and their meaning structures. The more informal part of the observations that is more in tune with the Gadamerian hermeneutic tradition included a “collective, dialogical enterprise” (Wagenaar, 2011, p. 266), based on the notion of dialogue. Phenomenology supported the interpretation of the meaning of what is going on in the meeting itself; in terms of what the narratives are from the various communities of practice, and the meaning of those narratives. This was helpful in making theoretical level connections.

The process of data collection started in fall of 2014 and lasted through fall of 2016. Observations were carried out through the entire period of data collection. The
formal interviews were carried out in the summer and fall of 2015. The data collection period also coincided with the City of Cleveland’s Sustainability Initiative’s Year of the Clean Water. Sustainable Cleveland 2019 is a ten-year process to work on sustainability related issues throughout the city and in the greater Cleveland area to build socio-economic and environmental capacity for the future. Each year has a celebration topic such as clean energy, year of zero waste, local food, etc. With 2015 being the Year of the Clean Water, the Greater Cleveland region saw a lot of action and mobilization around water resources. As a part of the year of clean water, a special working group was “elevating the conversation around clean and abundant freshwater as a regional asset, forging collaborations among partners to collectively implement water education and outreach projects, and promoting the multitude of watershed and water-related organizations, programs, and events throughout Northeast Ohio” (Sustainable Cleveland, 2017). The Year of the Clean Water thus presented the opportunity to capture various perspectives and follow actions, conversations and discussions, projects, and initiatives that relate to clean water generally, and related to the Cuyahoga watershed.

I started attending various meetings and began participating in various site visits in October 2014. The first event was a Cuyahoga River Restoration Projects tour led by the Cuyahoga RAP. This became an access point to know about more tours, site visits, and meetings within the watershed. The majority of the meetings and events that I attended and observed were centered on pollution mitigation and protection and restoration related actions within the watershed (e.g. Balanced Growth planning meetings, planning agency watershed subcommittee meetings, planning and public meetings on restoration and conservation projects in the subwatersheds, and stormwater
management trainings). Observations were also carried out in the various events and meetings on other aspects of watershed management such as economic redevelopment and revitalization, planning for educational and recreational opportunities, and maintenance of commerce and navigation. In qualitative/interpretive forms of research, the kind of data a researcher pursues depends on the access (e.g. relationship with the community being studied, institutional access, organizational constraints) and there is access available to some things, but not others (Charmaz, 2006). Thus, I could not gain ready access to several meetings and events conducted in the realms of economic redevelopment and revitalization, commerce and navigation. Data for these aspects of watershed management thus relies on the review of grey literature on the subject.

**Interviews**

Smith et al. (2009) point out the key aspects of data collection through interviews using an IPA strategy, which set IPA apart from other interpretive research methods.

1) Within IPA research the purpose of data is to understand people’s involvement an orientation towards the world, in other words, how people make sense of the world and how they understand their experiences.

2) Therefore questions in IPA research are open and exploratory, not closed and explanatory.

3) The data should focus on processes and not outcomes, and try to capture meaning.

IPA requires ‘rich’ data or descriptions in the form of stories, narrated freely and reflectively, detailing thoughts and feelings; in-depth, one-to-one interviews are best suited for this purpose. The interviews for this study were carried out in a format where the researcher and the participant were able to “engage in a dialogue whereby initial
questions are modified in the light of participants’ responses, and the investigator is able to enquire after any other interesting areas which arise” (Smith et al., 2009, p. 57). Since the purpose is to get access to a person’s perspective of being part of the phenomenon, the interviews were carried out in a conversational format that facilitated interactions and allowed the participants to tell their stories. Two types of interviews were conducted – in-depth, semi-structured, and open-ended interviews; and unstructured and more informal conversation type of interviews (conducted at the time of observations) (Patton, 1990; Smith et al. 2009).

The unstructured interviews were carried out throughout the data collection process, not through a formal pre-determined appointment to meet for interviewing, but mostly from observing a particular setting (emerging while carrying out observations) and taking the opportunity that arises to have short interviews in the observation setting (e.g. opportunity to informally chat) (Robson, 2007). This process has the advantage of allowing the participants to talk about issues of their priority, letting the information follow whichever direction seems appropriate. Since most of the questions arise out of the immediate context, this interview format was followed in combination with observations that were carried out. This added more value to the interpretation from the observations and helped me understand the participants’ viewpoints and reactions about a particular situation or issue. No predetermined sets of questions were used, as most of the questions arose from observing the setting itself. However, some questions were carried on from previously conducted observations and cues and information picked up previously, and the participant (when present in the previous observation setting, though
this might not always be possible) were asked to shed further light on them (Patton, 1990).

In addition, eighteen in-depth, semi-structured interviews were conducted. The research questions that guide this study also guide the interviews, but are asked directly. Within IPA the interviews are set up “as an event which facilitates the discussion of relevant topics, and which allow the research question to be answered subsequently, via analysis” (Smith et al., 2009, p. 58). An interview protocol was used only as a guiding tool to conduct the interviews. This schedule represented a loose agenda based on the topics to be covered. The interview process was essentially a conversation between the researcher and the participant and was set up in a conversational manner. The use of semi-structured interview approach facilitated rapport between the interviewer and the interviewee and permitted greater flexibility of coverage (Smith et al., 2009). The interviews lasted 90 - 120 minutes. Some interviews lasted for several more minutes owing to the interest and the willingness of the participants. The interviews were recorded and transcribed in full.

The sample for the interview process was selected purposively. Starting from my own personal contacts and opportunities that arose during observation process, the sample was expanded based on a system of referral and snowballing (Smith et al., 2009, Yin, 2009). The purposeful sampling method is appropriate for this research project as the purpose here is to get the participants’ perspectives (Creswell, 2007; Smith et al., 2009) on the governance of the watershed and how that shapes their collaborative actions and the transformation in the management and governance of the resource overtime.
Therefore, the sample that is selected for the study should be able to represent the ‘perspective’ rather than the population (practiced within positivist forms of research).

IPA specifically requires samples to be small and homogenous. Homogeneity is necessary for IPA since it explores the individual’s experiences of a phenomena; the basic factor being that all the individuals should have experienced a phenomenon. Mostly the samples are kept homogenous in terms of their socio-demographic factors (Smith et al., 2009). In this project, watershed governance is the context and subject matter under exploration; homogeneity in the study sample is attributable to the participants being a part of the governance processes. Since there are several watershed management arenas/areas that result in different management actions – a maximum variation strategy (determining a criteria in advance for selecting participants and study sites) – was used to select participants from the various management arenas (Creswell, 2007). This increased the likelihood of covering a range of perspectives and interpretations regarding the nature of governance efforts. This strategy is well suited to the issue under study as the assumption is that the various actors/individuals within each governance arena have different experiences, while I investigate the core elements and the shared experiences and the outcomes (Patton, 1990).

**Secondary Data for Network Mapping**

Use of secondary data or archival records to derive network data for a more extensive representation of the networks have been advocated. In this mixed method social network analysis (SNA) secondary data can be inductively explored for informative content material and then organized and converted into quantitative data for network analysis and mapping (Williams & Shepherd, 2015). As previously described,
the primary network tool used here is network mapping, to get a snapshot of the “bigger picture” of the network of governance actors. In other words, network mapping is used as a starting point to interrogate connectivity among actors and as an overlay to understand the interpretations used to characterize the SES and evaluate the capacity of the SES for adaptive governance. There are three stages involved in the mixed method approach to network mapping. In stage 1, secondary data is sourced for analysis, based on the research questions, potential for quantification, and anticipation of potential diverse outcomes. In stage 2, data is developed and converted for mapping and analysis. In the final stage 3, data is mapped using NetDraw, the network-mapping component of the social network analysis software UCINET (Williams & Shepherd, 2015).

A goal of this study is to understand the governance of the Cuyahoga River and discern the network of actors that have come together within this overarching governance context deal with problems or dilemmas pertaining to the resource. To define the scope of the network mapping exercise, such that it provides a representative snapshot of the functioning network of actors as well as to define the boundary (or coding unit) for analysis, watershed scale planning efforts were chosen. This includes planning effort at the scale of the Cuyahoga River (the Area of Concern being the most representative) via the Remedial Action Planning (RAP) process, and the Watershed Actions Plans (WAPs) and Balanced Growth Plans (BGPs) for tributary watersheds to the Cuyahoga River.

The mapping sample includes data for nine watershed-scale planning efforts in the Cuyahoga River watershed. These planning efforts provide a robust context for exploring the founding of planning partnerships and networks to undertake the specific planning activities either triggered by a formal agreement (the bi-national Great Lakes
Water Quality Agreement in the case of the RAP), or policy, via the 1987 Amendments to the Clean Water Act’s section 319 program to fund watershed action plans, or state program such as the Balanced Growth Plan program by the state of Ohio for connecting watershed planning to land use. These planning efforts were chosen for their concrete nature (for the purpose of drawing boundaries for mapping), and the strong prerequisite of public support, partnership, and collaboration in all the planning efforts. The planning efforts were taken as the primary “node” for the network mapping.

1) Stage 1 – Data Sourcing

The RAP planning documents (stage 1 and stage 2 report and the other RAP planning updates), watershed action plans for West Creek, Mill Creek, Tinkers Creek, and Middle Cuyahoga River watersheds, and the balanced growth plans for Chippewa Creek, Big Creek, Furnace Run, and Brandywine Creek were gathered.

2) Stage 2 – Data Developing and Converting

Because the plans in the network-mapping sample were undertaken under different policies/programs the composition of the categories under which partners and collaborators for the RAP, BGPs, and WAPs are classified differ. However, since the basic criteria for mapping the networks is partnerships and/or collaborations, the list of partnering or collaborating entities is adequate.

Two types of networks maps were created. A network map of the formal plan making process consisted of the officially constituted the steering committees of the plans and programs designed and implemented within the
watershed. This map shows the network structure and the extent of connections and overlap between nodes/organizations involved in the planning process. A second informal network map was created that consists of all partners, stakeholders, consultants and advisors that were involved in the planning process. As mentioned previously, the commonality between the three chose planning process was the participation and collaboration component. Therefore the network map based on informal connections shows the full extent of the participation and connecting in a watershed management process, in this case watershed plan making. The connections in the informal network map – what flows across networks – represent the flow of information and knowledge among the network actors.

3) Stage 3 – Network Mapping

Once the list of actors (representing organizations) was generated from the planning documents, both the networks were mapped using NetDraw. This process is described in the following section describing analysis.

The overall purpose of the network mapping is to add an additional layer to the interpretation process by depicting the nature and the extent of network processes existing within the governance context.

Description of Analysis

The analysis of the data, as the presentation of the results is divided into three sections. The analysis was initiated with document review of the grey literature and archival records. Once the background and the context were established, observations and interviews were analyzed to present the results of the study in three chapters. As
described previously, being interpretive and hermeneutic in nature, the research process was an iterative back-and-forth between the inquiry, data generation, analysis, exploration, and drawing of results.

I analyzed the data generated using a hermeneutic approach rooted in phenomenological legacy. An interpretive framework emerging out of the work of Husserl, Heidegger, Gadamer, and Dewey, and Wittgenstein is based on natural and social objects being embedded in “a communal background of intelligibility that preshapes how the world appears and who we are as agents” (Wagenaar, 2011, p. 40). Based on this understanding, hermeneutic meaning is about individual agents’ functioning in this background of understanding, and how they interpret themselves in light of it. Along with understanding the individual agents’ actions against a backdrop of shared understandings and routines, my analysis is also informed by discursive and dialogical understandings of meanings. I began with questions like – How do you see the river and the river watershed? And what does that mean to you? Moving on to questions such as – Help me understand the policy context of the watershed. What do these (the referred policy or policies) mean? For whom? And with what consequences? I conducted the analysis keeping in mind a discursive understanding of meaning, considering linguistic frameworks “unnoticed by individual agents, that constitute the categories and objects of our everyday world” (Wagenaar, 2011, p. 40). I was also attuned to the dialogical understanding of meaning and focused on “how meaning is constructed in the interaction between agents and between agents and the world in everyday situation” (Wagenaar, 2011, p. 41).
Irrespective of the type of interpretive research that is being conducted we brush up with the empirical world in terms of interviews, observations, and written materials. To develop theoretical insights from the data generated, I applied a grounded theory approach – the hot core of qualitative/interpretive research – where we set up a dialogue between theory and the world, through empirical insights and heuristic flexibility. Interpretive research provides us with heuristic flexibility, where we are able to constantly adjust our understanding with the empirical data, and when the world talks back to us that compels us to refine, modify, or change our insights, grounded theory building helps us “see” something in our data that presents a valuable insight and a connection with theory (Wagenaar, 2011). Grounded theory can be adapted to conduct diverse studies and here I used it in conjunction with IPA and an ethnographic approach (Charmaz, 2006). Both IPA and grounded theory have an inductivist approach, and are compatible in that sense. While IPA offers “a more detailed and nuanced analysis of the lived experience of a small number of participants with an emphasis on the convergence and divergence between participants,” grounded theory approach towards the same topic pushes “towards a more conceptual explanatory level based on a larger sample and where the individual accounts can be drawn on to illustrate the resultant theoretical claim” (Smith et al., 2009, p. 202). And as such an IPA approach leads to a grounded theory analysis (Smith et al., 2009). The emergent theory is presented in Chapter Seven.

Chapter Five – Characterization and Analysis of the Social-Ecological System – presents the focal system (the part of the Cuyahoga watershed) and a framework that was developed to analyze the Cuyahoga river SES. This chapter addresses the first research question. The focus of this chapter is the analysis of the SES from a governance and
management perspective, and whether the governance of the SES is adaptive in nature. Secondary documents (grey literature) and data collected from through the observations were used to draw the results for this chapter. The results include the current ecosystem services that are being provided by the SES, the biophysical and social elements that drive the system, and the governance and management influences. The analysis also reveals various components of adaptive governance that are part of current management efforts and areas where capacity could be built for adaptive governance.

Chapter Six – *Practice of Governance: Experiences and Meanings* – outlines the meanings that emerge from the various governance actors in the process of everyday policy implementation or through the practice of governance. This chapter addresses the second research question. The results include the “discourses” or specific meanings (of water policies) communicated by the various communities or practice, the points of overlap and conflicts between various meanings that reflect different interpretations. And lastly, I demonstrate how different meanings and interpretations reflect different ways of seeing and have implications for actions by various groups/communities of practice.

Chapter Seven – *Hermeneutics in Watershed Governance* – explores the watershed governance through and interpretive hermeneutic lens. This chapter addresses the third research question. The results reveal that the dialogues and deliberations, understanding perspectives of others, and working through collaborations and networks create a hermeneutic space that leads to a shift in understanding. This shift overtime has contributed to a transformation in the governance of the watershed. Interviews (both formal and conversational) and observations form the basis of results and discussion presented in this chapter. Additionally, Gadamer’s lens of tradition, authority, and
prejudice is used to interpret water pollution control and mitigation regulations across eras of water management in the United States and provides a guiding framework for understanding the transformation in the nature of watershed governance in the Cuyahoga River watershed.

**Study Limitations**

This study has several limitations that are important to note. For any study involving complex social-ecological systems, there needs to be an acceptance of the limitations in understanding the system and its components and feedbacks entirely. The data collection for this study was carried out over a period of two years, however, it has been suggested that even a 4-6 year time frame used in most implementation research also misses many critical features in public policy. A period of 10-20 year period is required to fully grasp the complexity of policy implementation (Sabatier, 1986). Due to the limitations of time frame for a dissertation research and access to individuals that could be interviewed for historic narratives, at higher agency levels (such as USEPA), data could not be collected for describing the change/shift in policy (the CWA and its amendments) in the later 1980s. This part of the analysis relied on archival records and secondary literature on the topic.

There were some challenges in the ethnographic part of the fieldwork that emerged in the process of conducting the observations and the interviews. Since the conceptualization of the study drew a lot from the initial observations from the field and the informal/unstructured interviews, I had to balance what watershed managers/stakeholders expect and what I could focus on (based on literature in the field,
overall scope of the project, timeline of the study) in terms of honing down the scope of the study.

Access was another issue in fieldwork. As previously mentioned, the data collection period coincided with the City of Cleveland’s Sustainability Initiative’s Year of Clean Water. This afforded me an opportunity to attend numerous water and watershed management related meetings, activities, tours, and seminars. However, relying on notifications or trying to get invitations to certain meetings didn’t work out several times and I missed a few interesting opportunities for conducting observations. I also had more access to watershed planning and program related agency board meetings and public meetings because of the nature of these activities (open to public) as opposed to meetings on economic development and revitalization aspects of the governance (more closed with local businesses participating and not open to the public). I also didn’t get access to conduct formal interview with the agency staff at Ohio EPA Columbus office and the USEPA Region 5 office in Chicago. Therefore to understand the role of these agencies and how that has evolved over years, I had to rely my observations and narratives and public statements(addresses of the staff members from these organizations at public meetings and symposiums.

The Cuyahoga River watershed is a complex system/complex SES. Quantitative methods process and summarize massive amounts of data on complex systems, and qualitative methods are able to “describe the contexts of systemic properties and evolutions, as well as the contexts and meaning making process of actors/agents of systems” (Morçöl, 2012, p. 193). For complex systems quantitative methods model limited aspects of these systems and in the process simplify complexities. It has also been
recognized that the knowledge of complex systems in partial and quantitative simulation of reality cannot match the complexity of the system. Qualitative methods on the other hand do not correspond to the real complex systems on a one-to-one basis either.

Therefore for the best study of complex systems both qualitative and quantitative methods are needed, although the forms of understanding gained would still be partial (Morçöl, 2012). This study is a primarily qualitative exploration of the Cuyahoga Watershed and the governance of the watershed. However, for the social network mapping aspect, a mixed-method approach has been used where qualitative data from documents reviews is converted into quantitative data for network mapping. Future research could benefit from using a combination of interpretive/qualitative method as used in this project and quantitative approaches/techniques such as agent-based modeling and social network analyses.

Lastly, an argument could be made about the limited generalizability, or predictive ability of this study. The discussion in Chapter Three addresses some of these concerns in setting up the rationale behind and the conceptual context of this study. Moreover, the criteria or standards that are applied to evaluate interpretive research are vastly different than that for traditional empirical research. As such, transferability is more suited for interpretive forms of research than generalizability. The next section presents a discussion on the evaluative criteria that could be applied to this research.

**Issues of Validity and Evaluative Criteria**

For interpretive types of research, the key aspect to be kept in mind is that the aim of such research is “theoretical transferability rather than empirical generalizability” (Smith et al., 2009, p. 51). Schwartz-Shea (2006) asserts that for interpretive researchers
it is important to step back from a normative, a priori, deductive approach of evaluating research, and to take an inductive approach to evaluate interpretive research. Schwartz-Shea (2006) synthesized the various evaluative criteria used by several authors of qualitative research methods (such as Lincoln and Guba, 1985; Eisner, 1991; Maxwell, 1992; Erlandson et al., 1993; Lather, 1993; Riessman, 1993; Miles and Huberman, 1994; Lincoln, 1995; and Brower, Abolafia, and Carr, 2000) and combined them based on the quality of the criteria. These four general evaluative criteria for interpretive forms of research are described below:

**Thick Description**: Within interpretive research the narrative (data) of an event, setting, person, or interaction should be detailed. The researcher should be able to capture the context-specific nuances of meanings of such narratives in their interpretation. This is especially useful in assessing the processes of observations (carried out by the researcher) and document analyses. The researcher’s interpretation should be supported by thick description of the events, settings, and interactions that are described.

Lincoln and Guba (1985) use the criteria of “transferability” in place of generalizability. For this purpose thick descriptions are important, as when the researcher provides rich, transparent, and contextualized descriptions, it makes it plausible for others to transfer the findings of a research to other settings, which are more or less similar.

I have provided a nuanced detail of the cultural layers and a detailed and interactions, events, and their interpretations (Schwartz-Shea, 2006). I have included excerpts from observations, events, and documents and direct quotations from interviews along with analysis based on the commonality of themes emerging from the interviews.
**Trustworthiness**: This term captures the idea that the research that has been conducted needs to be trustworthy. The researcher should make sure that the steps that they follow in their research process are deliberate, transparent, and ethical. This should be done to a degree that other researchers should be able to follow it and build on its analysis. The trustworthiness of my analysis and interpretations rests, in part, on the variety of degree of perspectives included in the study. This includes considering the amount of time spent in the field mapping the settings relevant to the policy issue, the justification of the use of purposive selection of research participants, and the documents reviewed to build a compelling case and arrive at the results. I have described in detail all of the above aspects of the research process throughout this chapter and others.

**Reflexivity**: Reflexivity is especially useful to phenomenological forms of research. This refers to the role of the researcher in the research process, engaging and reflecting on the data and the higher-level theoretical concepts, and being cognizant of self in the research process. This process is detailed in Chapter Three. Throughout the research process, I reflected on my positionality and how that interacted with the manner in which I collected the data and interpreted and presented the results, which is the characterizing element of interpretive and phenomenological forms of research. I demonstrated this reflectivity in descriptions of the research methods and presentation of the results of this study. Indeed, the organization of this dissertation and the emergence of theoretical and analytical frameworks in the result chapters is a demonstration of the iterative, reflexive nature of this study itself.

**Triangulation**: This refers to the use of at least three different analytic tools to understand a phenomenon. I tried to make the study as robust as possible by using three
research approaches – ethnography, interpretive phenomenological analysis, and social network mapping. Using multiple methods of accessing data within a single study such as interviews, observations, and documents also qualifies as triangulation. As mentioned earlier in this section, the use of multiple methods to collect data for this research goes towards the purpose of using a triangulation methodology, so that the weakness of one data collection approach can be compensated by the strength of others.

For the interviews that were carried out using the IPA methodology, the following criteria could be used for judging the validity of the research (Smith et al., 2009).

**Sensitivity to context**: Understanding in-depth the study context through the existing literature on the topic and the materials that the participants within the study share can show sensitivity. Bringing in skill, awareness, and dedication to the interview process can also show sensitivity. Making sense of the sense-making activity in which the participants are engaged and being able to interpret that and understand nuances of the phenomenon is also key to sensitivity. In order to provide substantial evidence to analytical claims that are being made in the research, the analysis should be substantiated with verbatim extracts from the interviews to support the argument being made.

Document analysis was the first step and arguably one of the most important in setting up this study by providing background and context, information about the key governance actors, and serving as “grey” literature for drawing of results. The interviews were designed in a semi-structured, conversational format to give the participants maximum opportunity to share their narratives and stories about the everyday practice of policy implementation and the realities of governance. Fieldwork was conducted over a period of two years, and sufficient rapport was built with watershed managers, public
officials, watershed stakeholders through repeated interactions in public events and meetings before approaching them for interviews. I took great care to ask context specific questions during interviews. The results include sufficient verbatim extracts/direct quotations from the interviews to support the arguments that are being made. Throughout the result chapters, primary and secondary sources are referenced for the results that are presented.

**Commitment and Rigor:** Rigor is associated with appropriateness of the sample to the research question, the quality of the interview conducted, and the completeness of the analysis process. The attentiveness with which I conducted the interviews and the extent of care that I took in carrying out the analysis exhibited my commitment to the research process. Picking up cues from the participants during the interview process is a key aspect associated with rigor of the study. As noted earlier, most of the interviews ran for more than 60 minutes owing to the interest and involvement of the participants in the subject under study. Rigor in interpretive research is also demonstrated by philosophical rigor, that is, “a rigor of logic and argumentation” (Yanow & Schwartz-Shea, 2006, p. xvi).” I aimed for such rigor by matching my research approaches and methods to the ontological and epistemological position that informed my research (Travaline, 2012).

**Transparency and Coherence:** Transparency can be achieved by fully and clearly describing the steps in the research process including – participant selection, construction of the interview schedule, conducting the interview process itself and the steps followed in the analysis. Coherence refers to the degree of fit between the research process and the underlying theoretical assumptions.
Each of the results chapters consists of a detailed description of the methodology used for the analysis of data. As mentioned previously, I aimed to match my research approaches and methods to the ontological and epistemological position that informed my study.

**Impact and Importance**: This is one of the most important evaluative criteria as it questions the importance and the relevance of the research. Throughout the conceptualization, data collection, and data analysis process I constantly kept in mind the relevance of this research work for academia as well as practice. Since the research was grounded in practice, with contribution of practitioners in helping shape the scope and the focus of the research, there has been a focus on the practical applicability of the frameworks that emerged through the research and of the results of the research. Parts of this research project were presented at various academic conferences. Journal manuscripts based on one of the chapters in this project is currently under review in a peer-reviewed journal. Additionally, each of the results chapter includes a discussion in the end outlining the implications of the results and analysis for practice.

Lastly, the most important evaluative criteria associated with interpretive research is that that analysis should be sufficiently interpretive, “moving beyond a simple description of what is *there* to an interpretation of what it *means*” (Smith et al., 2009, p. 181).
CHAPTER V

CHARACTERIZATION AND ANALYSIS OF THE SOCIAL-ECOLOGICAL SYSTEM

Life is full of surprises. Sometimes we take them in stride; sometimes they trip us up...Resilience thinking is about understanding and engaging with a changing world (Brain Walker & David Salt, 2006).

Managing resilience requires understanding how historical system dynamics have shaped the current system. Social-ecological systems are dynamic and...having a broad overview of system change through time can reveal system drivers, the effects of interventions, past disturbances and responses (Resilience Alliance, 2007, p. 22).

Social-Ecological Systems (SES), Resilience, and Governance

Environmental management is associated with complexities and uncertainties, thus social-ecological systems (SES) framework and resilience thinking has influenced much of the scholarship within this field (McGinnis & Ostrom, 2014; Ostrom, 2007, Walker & Salt, 2012). Central to this epistemological and ontological orientation is resilience thinking or discourse and the concept of SES. The key focus of an SES lens is linking the ‘human system’ (communities, society, economy, etc.) with the ‘natural
system’ (ecosystems, biophysical elements, etc.) and mapping the interconnections and feedbacks between these systems. Resilience is the ability to maintain the structure and function of a system of humans and nature in the face of unexpected shocks and disruptions to the system (Berkes et al., 2014).

The interconnections or feedbacks between the ecological and social systems relate to “people’s knowledge (e.g., local or traditional knowledge), and management institutions, as well as ‘rules’ and ‘norms’ that mediate how humans interact with the environment” (Berkes et al., 2014, p. 2). The fundamental characteristic of an SES framework, which lends itself to critical importance in the study of governance and management of environmental systems, is “that humans can make conscious choices as individuals or as conscious members of collaborative groups, and that these individuals and collective choices can, at least potentially, make a significant difference in the outcomes” (McGinnis & Ostrom, 2014).

Using an SES lens to explore governance helps focus on human choices and decision-making. As described previously, governance is key to managing complex environmental problems. Governance is a process that includes laws, regulations, discursive debates, negotiation, mediation, public consultations, protests, and other such participative decision-making processes. Rather than referring to the process carried out by the government, as commonly understood, by governance I mean processes that are decentralized and characterized by interactions between many actors such as private and nonprofit organizations, beyond or in association with government authority (Stoker, 1998). Governance consists of the processes through which institutions and policies are shaped, and as such, influence co-evolution of SES in ways that can both enable and
constrain SES resilience. Thus understanding governance influences and attributes is key for managing SES resilience and achieving desired outcomes (Mitchell, Lockwood, Moore, & Clement, 2015).

Various arrangements and attributes of governance such as “participation, representation, deliberation, accountability, empowerment, social justice, and organizational features such as being multilayered and polycentric” (Lebel et al., 2006; p. 2) are key in adapting to uncertainties and managing future challenges and opportunities (Mitchell et al., 2015). A key aspect of managing resilience in self-organizing systems is to effectively integrate the knowledge and understanding gained from different sources (Lebel et al., 2006).

An SES lens for studying governance systems would focus on governance arrangements that adapt overtime in response to changing SES conditions and feedback. Key elements that define the success of such governance arrangements are “(i) the presence of ‘multi-level institutions’, (ii) partnerships among state and non-state actors, (iii) appreciation of diverse perspectives and knowledge, and (iv) shared learning and social processes that provide opportunities for adaptability” (Berkes et al., 2014, p. 5). An SES analysis of a complex resource system can be useful in determining how social and natural elements relate to each other (focus on the integrated nature of SES), governance and management influences, and the meaning, motivation and outcomes of resource users and systems (Berkes et al., 2014).

**Urban SES, Resilience, and Adaptive Governance**

In exploring the idea of cities or urban areas as SESs, scholars have linked essential services to ecological processes (Ernstson et al., 2010; Evans, 2011). These
‘ecosystem services’ – the benefits that city inhabitants derive from ecological processes – include clean air and water, stormwater drainage, sewage treatment, flood mitigation, and recreational opportunities (Ernstson et al., 2010). Traditionally SESs have been defined as:

Coherent system of biophysical and social factors that regularly interact in a resilient, sustained manner; a system that is defined at several spatial, temporal, and organizational scales, which may be hierarchically linked; a set of critical resources (natural, socioeconomic, and cultural) whose flow and use is regulated by a combination of ecological and social systems; and a perpetually dynamic, complex system with continuous adaptation. (Redman et al., 2004, p. 163)

Missing however, in this comprehensive definition and associated viewpoint is a key question – how is such a system administered and how is the knowledge for such administration generated (Evans, 2011)? In focussing on urban SES in more recent work, resilience scholars recognize that ecological processes are intertwined with and modified by social, and therefore political processes (e.g. competing land-use). From a resilience perspective, governance is “purposeful collective action (among state, private, and civil society stakeholders) to either sustain or improve a certain regime, or to trigger a transition of the system to a more preferable regime; these are referred to as adaptive capacity and transformative capacity, respectively” (Ernstson et al., 2010, p. 533).

Resilience and SES thinking also views systems (e.g. governance, ecological) as complex adaptive systems, therefore, adaptive capacity or adaptive governance is key to the long-term sustainability of urban SES (Evans, 2011; Wilkinson, 2012).
Research Questions and Analysis Method

In this chapter I address my first research question – *What are the various influences and dynamics that shape the Cuyahoga River as a watershed SES? How can a watershed SES be characterized and understood so that the influence of governance on system attributes and the attributes critical for building adaptive capacity can be identified?*

This chapter presents the characterization and analysis of the Cuyahoga River Watershed SES. Secondary documents (grey literature) and data collected through observations were used to draw the results presented here. This includes an analysis of the historical and current ecosystem services provided by the SES, the biophysical and social elements that drive the system, and the governance and management influences. The analysis reveals various components of adaptive governance that are part of current management efforts. The following section outlines the method used to analyze the data presented in this chapter.

Social-Ecological Systems Analysis

SESs consist of sub-systems that encompass cultural, political, social, economic, ecological, and technological components interacting in complex ways. SES analysis encompasses the analysis of these multiple and interconnected sub-systems (Resilience Alliance, 2010; Mitchell et al., 2015). Ostrom (2007) initially proposed an SES analysis framework. An informal “SES club” within the Resilience Alliance has been working on and advancing this framework. Though a work in progress, this framework has advanced over the years, and has developed well enough to be used to study an array of resource settings throughout the world (McGinnis & Ostrom, 2014). Mitchell et al. (2015) argue
that the SES discourse primarily associated with the Resilience Alliance has been limited
in its application to effect change within social systems, has lacked a substantive focus on
human agency, and the effect of governance, institutions, and power. Wilkinson (2012)
also points out the gap between the depth and the extent of scholarship on social-
ecological resilience in the scientific literature, and the limited demonstration of
application or use of the resilience framework in practice. Additionally, the “language
and the density” of the concepts used within the SES discourse and operationalizing
resilience concepts in practice has been critiqued by practitioners (Wilkinson, Porter, and

Application of Social-Ecological Systems Analysis

Over the past few years there have been some efforts to apply theoretical and
models and frameworks based on SES thinking to case study applications, at least within
the realm of resource management scholarship (Mitchell et al., 2014). Most recent among
these include a special feature on analysis of various SES frameworks and their case
study applications in the Resilience Alliance’s journal *Ecology and Society* in 2014. The
basic “social-ecological systems framework” that these studies build upon is based on
Ostrom’s (2009) work involving four core systems – resource system, governance
system, resource units, and users. Critiquing the practical applicability of the Resilience
Alliance’s SESs framework to effect change within social systems, Mitchell et al. (2015)
developed an approach to conceptual SES modeling that has an explicit focus on
governance dimension and influences on environmental decision-making. Simplifying,
breaking down, and operationalizing the dense SES concepts used by scholars in ecology,
Mitchell et al. (2015) offer a framework oriented in practice, and address the governance
and analytical dimensions of resilience (Wilkinson et al., 2010). By exploring the influence of governance on SES dynamics, this conceptual model explicitly focuses on attributes identified as critical for adaptive governance.

Most of the SES analysis and conceptual models are based on/applied to cases of natural resource management (Hinkel et al., 2015; Hinkel, Bots, & Schlüter, 2014), biodiversity conservation (Mitchell et al., 2015), community based resource management and conservation (Berkes et al., 2014, Berkes & Ross, 2013), pastoral/agricultural management (Haider, Quinlan, & Peterson, 2012), and natural resource management in rural communities and agricultural management (Hinkel et al., 2015; Mitchell et al., 2014). That is, historically, most resilience scholars have focused on empirically analyzing non-urban areas (e.g. production forests, shallow lakes, small-scale agriculture, etc.) and have paid relatively less attention to human-dominated ecosystems and the relationship between human dimensions and social elements, and their effect on ecosystem outcomes (Ernstson et al., 2010). The exploration of urban SES and what resilience means in an urban governance context is an area that is relatively unexplored (Wilkinson, 2012).

In an urban context, an extension of Ostrom’s SES framework was used to examine the combination of variables that affects collective action and ecological performance for an urban social-ecological commons case in India (Nagendra & Ostrom, 2014). Using social-ecological orientation as a common language across diverse sectorial and disciplinary interests for strategic planning in an urban context has also been demonstrated as an effective tool in planning practice (Wilkinson, 2012). The concept of resilience has also been applied by urban planning scholars to a range of areas such as
disaster planning and management, energy and environmental security, urban design, and urban water management, among others (Wilkinson et al., 2010). While directing significant attention towards urban resilience and governance, these studies also demonstrate the need for and the usefulness of an SES lens to explore resilience and adaptability of urban systems.

Given this background, the contribution of this chapter is twofold:

1) I conduct a characterization and analysis of a complex urban social-ecological system. That is, a largely urban watershed closely shaping the ecology and economy of Northeast Ohio.

2) I use a conceptual model approach drawing chiefly from the work of Mitchell et al. (2015) to explicitly focus on the influences of governance and draw on SES dynamics and resilience attributes that are critical for building adaptive capacity.

Combining the frameworks proposed by Resilience Alliance (2010), Mitchell et al. (2015), and Ernstson et al., (2010), this research furthers the application of an SES framework focused on governance to an urban governance case.

**Social-Ecological Systems Analysis Framework**

Following the frameworks proposed by Resilience Alliance (2010), Mitchell et al. (2015), and Ernstson et al., (2010), I conduct an analysis of an urban SES, and map the governance attributes that contribute to SES dynamics. I study the governance of the Cuyahoga River, a largely urban watershed, with the river governance closely interwoven with the urban governance in the region. The use of an SES lens and a Resilience Assessment framework fits the overall ‘interpretive focus’ of this dissertation project. The analysis that I conduct is consistent with a qualitative interpretation and
understanding of an identified issue, and draws on diverse sources of knowledge and the need for constant and ongoing reflexivity (Wilkinson et al., 2010).

Following the guidelines of the Resilience Assessment workbook (2010) for practitioners, resilience assessment is useful in creating a conceptual model of an SES that includes ecosystem resources, stakeholders, institutions, and issues. Resilience assessment can thus provide helpful insights into developing management and governance strategies to deal with uncertainty and build adaptive capacity. The SES analysis that I conduct, which also corresponds to a resilience assessment exercise, includes the following steps:

1) Defining the focal system
2) Identification of the key components of the SES – mapping of factors defining the focal system
3) Mapping the governance and management influences
4) Identifying the presence of key attributes that are critical for adaptive governance

The first step in the analysis or assessment hinges on two broad questions. The first question is – resilience of what? This includes identifying and defining the ‘focal system’ – defining the social-ecological system with spatial (e.g. region, scale) and temporal (e.g. time period such as five-or fifty-year period) boundaries (Resilience Assessment, 2010). The second question – resilience to what? – requires identifying the main issues of concern regarding the focal system as well as uncertainties, disturbances, and disruptions that could affect the system is also a key part of this step (Mitchell et al., 2015; Resilience Assessment, 2010).
The second step involves an identification and analysis of the factors that affect the focal system (Mitchell et al., 2015). These factors or components are classified as ecological or biophysical factors (e.g. benthos habitat, climate variables, wetlands, sediments, and endangered species), social factors (e.g. land-use and development, watershed plans and programs, watershed restoration, economic motivation for watershed management, and social capital and trust) (Resilience Assessment, 2010).

The third step involves mapping the governance and management influences. Governance provides a vision and direction (e.g. through policy) and management operationalizes this vision (Folke et al. 2005; Mitchell et al., 2015). Governance and management influences affect social and ecological drivers in a manner that modifies the focal system (Mitchell et al., 2015).

The final step involves identifying the key attributes that are critical for adaptive governance from the results presented in this chapter. Adaptive governance enhances the capacity of SESs to adapt to and shape change during periods of changes and disturbances in order to maintain their key ecosystem functions. Key aspects of building adaptive capacity are: connectivity between individuals, organizations, agencies, and institutions at multiple levels of operation; creation of a learning environment through leadership, trust, and vision; the capacity to self-organize into networks that draws from various types of knowledge; and presence of bridging organizations that bridge for support and lower the costs of collaborations (Folke et al., 2005).

I used a combination of data sources and data collection methods to identify the focal system and the drivers. The biophysical and social factors that are more case specific and unique to the watershed were identified using ‘grey literature’ on the
Cuyahoga River watershed (including the history and development of urbanization), observations conducted at various public meetings, and interview data. Governance and management influences were first identified through a review of literature specific to identifying the attributes of adaptive governance (Folke et al., 2005; Lockwood et al., 2012; Olsson et al., 2006) and factors that contribute to urban resilience or are found to be key in governance of urban SES (Ahern, 2011; Ernstson et al., 2010; Wilkinson, 2012). Once the initial set of governance and management influences from literature were identified, they were confirmed through observations, review of grey literature, and interviews. The governance and the management influences identified in this chapter are further extended using interview data, and the meanings and experiences of the governance actors. I present this discussion in Chapter Six.

A systematic review of the documents provided information about the governance context, information about the key stakeholders and actors, the history of policy and governance, information about the intuitional structure for policy and program implementation, and the network of actors and organizations working in the watershed. I categorize the policy areas and overall management into three arenas and the description of these management arenas emerge from the document analysis. Comparing the policy documents overtime also shed light on the changes and evolution in policy language, which points at contextual factors and evolution in the overall nature of governance. I also discuss the influence of policies and legislations in motivating collaboration and networking efforts. I also explore the structure of the networked governance in the watershed by mapping the watershed planning activities.
Analysis of Data for Network Mapping

In order to investigate the nature of interorganizational networks that are associated with the governance of the Cuyahoga River, I undertook a network mapping exercise. Here network mapping is used as a practical tool for providing a snapshot of an aspect of the “bigger picture” of the network governance, identifying the most influential actors and demonstrating the relationship between various actors. As discussed in Chapter Four, I use secondary data gathered through review of documents to generate data for network mapping.

Defining a network boundary is the first step in any network exercise. Since it is often not possible to know the whole universe of organizations and connections associated with social processes, to conduct network-mapping exercise in a way that meaningful insights can be drawn from it, defining the boundaries of the network is important (Lelong, 2014). I used watershed-planning activities and watershed plans as the main boundary specification criterion. The development of the plans and involvement of the actors in the planning activity is an aspect of the overall governance of the watershed. I chose watershed-planning activities, as documents related to watershed planning were readily available.

The plans that were used as the basis of network mapping for this study are: the Remedial Action Plan (RAP) for the Cuyahoga River Area of Concern (AOC), and Balanced Growth Plans (BGPs) and Watershed Action Plans (WAPs) for the tributary watersheds of the Cuyahoga River. For the formal network of planning activities, the constitution of the steering committee of the various planning documents was considered. For the informal or extended network, all the actors (actors representing organizations)
that were associated with the planning activities were considered. It emerged from the observations that actors associated with the planning activities either as consultants, or as technical experts for providing comments and inputs are most often the key nodes and sources of information and knowledge, yet are not considered formally with the plans. These actors and others become a part of the informal network due to their experiential knowledge about local conditions (political, ecological, socio-economic), being stakeholders in the resource management process, due to their leadership and influential positions in the local communities, and possession of technical knowledge about specific aspects of the issue. This process of tracing ties outside the formal recognized network of actors associated with watershed planning processes reflects my goal of understanding the nature and extent of informal and non-governmental aspects of overall watershed management (Chaffin et al., 2016).

Through the review of documents, I created a database of the various plans and the organizational actors involved in the plans. I used network analysis software UCINET to convert the qualitative data into numerical data to create the network maps. The visual component of the software, NETDRAW was used to create the tables and the network diagrams. A “two mode” type network has been created, the nodes being the watershed plans (e.g. Big Creek Balanced Growth plan, Mill Creek Watershed Action Plan) and the actors (representing organizations). The relationships between the nodes (represented by the lines) represent exchange of information, ideas, and resources for creating the plans.
Results: Description of the Focal System

Background (physiography, geology, land-use, and history)

The Cuyahoga River has shaped the ecology, economy, and the socio-political landscape of the Northeast Ohio for over two hundred years. The lower part of the river flows through some of the most urbanized areas in Ohio, including the cities of Cleveland and Akron (Figures 5.1 and 5.2). The river flows through the downtown part of Cleveland and drains into Lake Erie. The Cuyahoga River is closely intertwined with the trajectory and history of urbanization of Northeastern Ohio and is an integral part of the urban governance in the region.

Figure 5.1: Location of the Cuyahoga River watershed

The Cuyahoga River drains a total area of 812 square miles and flows through six counties, but mainly drains through the Geauga, Portage, Summit, and Cuyahoga Counties, and spans parts of 83 local jurisdictions (CRCPO, 2008a; Ohio EPA, 2016). The river watershed is made up of innumerable brooks, creeks, streams, and wetlands that form 1,220 stream miles, and consists of 26 subwatersheds whose creeks and streams contribute to the river’s flow (CRR, 2016; CRCPO, 2008a). The watershed or river basin
is often organized into upper, middle, and lower sections for planning purposes based on its physiography, geology, and land use (CRCPO, 2008a; Ohio EPA, 2016). Originating in Geauga County in the extreme northern end of the Akron-Canton Interlobate Plateau, the Cuyahoga gets its distinct U-shape due to its geological history as a river formed due to the retreat of the last of the glaciers. The river flows in the southwest direction from the headwater area through a long, narrow basin till it reaches Akron. From there it abruptly turns northwards and flows through a wide, deep valley to Cleveland, and finally to its mouth at Lake Erie. The middle part of the river (northeast of Akron) is situated with Erie/Ontario Lake Plain ecoregion, which is characterized by glacial formations, low gradients, and low flow velocity (Ohio EPA, 2016). The topography of the Cuyahoga varies from flat lake plain (the lower part near Lake Erie) to relatively rough, glaciated, dissected plateau (glaciated Allegheny plateau). The lower part of the river flows through the Cuyahoga Valley. This valley is hundreds of feet deep to bedrock, part of which is buried, and consists of permeable deposits yielding substantial amount of groundwater to wells (USFWS, n.d.).

Figure 5.2: Cuyahoga River watershed land use map (Source: United States Geological Survey)
The Cuyahoga River has a rich history, beginning with Native American tribes that used the river for nearly 12,000 years for fishing and hunting (for subsistence and trade), living space, and transportation. The river derives its name from the Native American word – “Ka-ih-ogh-ha” – which means crooked river. Maps and Jesuit records of the regions documented the Cuyahoga River in the 1600s. Early white settlers from Northern Europe arrived in the Cuyahoga Valley in the 1700s mainly as fur traders, marking the start of an era of “exploitation” of the river. By the turn of the nineteenth century, the Cuyahoga River had become the official western boundary of the United States. The area around the Cuyahoga River was also a part of the Connecticut Western Reserve, originally a part of Northwest Territory, owned and managed by the State of Connecticut in the years after the American Revolution (Hatcher, 1949). Pressures from the early European settlers gradually drove away the natives living along the banks of the river. New villages, towns, and cities started growing along the river. These settlements started building dams to harness the power of water for sawmills and gristmills (NPS, 2014; CRR, 2016; Ohio EPA, n.d.).

The natural drop of the river (395 feet in 38 miles) in the Cuyahoga Valley made it unsuitable for transportation. To provide a more reliable system of transportation, the Ohio & Erie Canal (O&E Canal) was built between 1825-1832, using water from the Cuyahoga River (Linking Corridor, 1999). Additionally, flowing water powered mills and the O&E Canal served as a conduit for the consistent passage of cargo between Lake Erie and Ohio River. The building of the canal increased the prosperity of the region by opening up new markets for agricultural products. The completion of the railroads in the
valley in 1850 encouraged industrial development and sparked the growth of an economy centered on trade and commerce based around industries. Soon population along the river and in Cleveland started growing rapidly and the river began experiencing an intensity of use. Over the better part of the nineteenth and twentieth centuries, with its access to Lake shipping, railroads, and the canal, and the growth of manufacturing facilities along the river, the Cuyahoga River turned into a polluted sewer. Environmental regulations and effective partnerships and local actions since the 1970s, along with the demise of industries, have helped in the recovery of the river. More recently, agency actors, and local watershed stewards and stewardship groups are working on bringing the river waters and the region around it back to life (CRR, 2016; NPS, 2014; Ohio EPA, n.d.).

Although the Cuyahoga is just 100 miles in length, there is significant variability in the geography as well as land-use in the watershed. Some of the major municipalities that are either partially or fully in the watershed are Cleveland, Akron, Kent, and Cuyahoga Falls. Land-use in the watershed, when broken down by upper, middle, and lower sections of the river, shows significant contrasts. The eastern upper part is predominantly agricultural with a mixture of cultivated crops and forests, while the western lower part is more urbanized (Ohio EPA, 2016). About 56 percent of the watershed is forested, agricultural lands and urban open space accounts for another 22 percent, 16 percent of the land is covered by wetlands, streams, and rivers, and 6 percent of the watershed consists of urban areas. The Cuyahoga River Watershed makes up less than 2 percent of Ohio’s total land area, but the 6 percent of watershed land that consists of urban areas supports 15 percent of the total state population. Most of this population is concentrated in the lower Cuyahoga (NPS, 2016). The Cities of Cleveland and Akron, in
the lower section of the watershed near the mouth of the river, are dominated by industry and dense urban development.

The underdeveloped parts of the watershed are predominantly confined to the areas of steep terrain along the river and some areas where tributaries drain into the river. The upper and middle portions, relatively healthy, have an abundance of wetlands and a State Scenic River designation (CRCPO, 2008a). Lakes, reservoirs, forests, wetlands, and croplands dominate the land-use in the upper part of the river, in Geauga and Portage counties. Low levels of urban development, and 19,000 acres preserved by the City of Akron for drinking water purposes, contribute to the health of the watershed. The middle part of the watershed, northeast of Akron, covering portions of Summit, Portage, and Stark counties, is dominated by urban development, followed by land use in agriculture, and less extensive forest and wetlands areas. The Cuyahoga Valley National Park occupies 22 miles of the river between Akron and Cleveland. The last 5.6-mile stretch of the river, a federal navigation channel, flows through downtown Cleveland before draining into Lake Erie. The Lower Cuyahoga and its tributary watersheds are affected by the land-use decisions of eighty communities, each of which drain directly or to a tributary of the Cuyahoga River (NPS, Bulletin, 2014; Ohio EPA, 2016; US Fish and Wildlife Service). The International Joint Commission (IJC) designated the lower 50 miles of the river, including the lower Cuyahoga and its tributary watersheds as an Area of Concern (AOC) in 1985 (CRCPO, 2008a; Ohio EPA, 2016).

The Focal System

As previously described, the first step defining a focal system is identifying the spatial and temporal boundaries. Based on the document reviews, interviews, and
observations, the lower section of the Cuyahoga River post the 1987 amendments to the Clean Water Act (CWA) emerged as the focal system for this study. The identification of the focal system is based on the historic use, the extent of disturbance (e.g. settlers, urbanization, commerce and industry), the designation of this section as an Area of Concern (AOC) by the International Joint Commission (IJC), and this segment being the focal point of policy and community efforts (via legislation, policy, stewardship activities, collaborations, education) organized around protection, restoration, and revitalization of the river and the watershed (see Figure 5.3). The upper and middle sections of the river before it enters the City of Akron are less intensely developed and preserved through reservoirs and lakes, forested lands, and agricultural land use. The river and the watershed changes dramatically in the lower reaches. As an example, while the City of Akron preserves the upper Cuyahoga basin as water supply reservoirs, waste water supply from the city enters the Cuyahoga in the lower basin. The description of the Lower Cuyahoga as a spatial boundary is described in further detail in the following sections.

Figure 5.3: The study area or the focal system. The left part of the figure shows the lower Cuyahoga River watershed in purple. The right part of the figure shows the
tributaries of the Cuyahoga River watershed with the AOC section in shades of blue and green. (Ohio EPA – Cuyahoga River Watershed, 2016 and Cuyahoga River Restoration, 2016)

The 1987 Water Quality Act (WQA) or CWA amendments ushered in a collaborative and/or experimental era of water pollution control and management. Coupled with the designation of the Lower Cuyahoga River as an AOC and the formation of the Remedial Action Plan (RAP) committee for carrying out remedial action planning, the WQA opened up doors for joint management of water resources. The WQA called for an ecosystem approach to pollution control and watershed planning, collaboration, and local stewardship and community action in managing the watershed.

**Ecosystem Services**

Resilience in SESs is the magnitude of disturbances that a system can take without flipping to an alternative or undesirable state that has different structural and functional properties and a fundamentally different set of ecosystem services. In order to support that adaptive governance is required, which builds capacity within SESs in away that they can continue providing key ecosystem services (Resilience Alliance, 2010). An ecosystem in general includes a set of interacting species and their local, non-biological environment. Urban ecosystems consist of all natural blue and green areas in the city and might include urban forests, cultivated lands, wetlands, streams, rivers, and the like (Bolund & Hunhammar, 1999). Ecosystem services are “the benefits human populations derive, directly or indirectly, from ecosystem functions” (Constanza et al., 1997). Based on Millennium Ecosystem Assessment (2005), Gómez-Baggettun et al., (2013) propose the classification of ecosystem services in four broad categories: 1) provisioning (e.g. food, freshwater, wood); 2) regulating (e.g. climate regulation, water purification, erosion
control); 3) supporting and habitat (e.g. habitat for species); and 4) cultural (e.g. tourism, recreation).

The Cuyahoga River has historically provided a variety of ecosystem services that have co-evolved overtime with changes in the watershed and the region caused by human domination and influence. Ecosystem services provided by the watershed can be evaluated based on the three distinct phases in the life of the river: Native American presettlement era, European settlers and industrial era; and post-industrial era (see Table 5.1).

<table>
<thead>
<tr>
<th>Provisioning Services</th>
<th>Regulating Services</th>
<th>Supporting and Habitat Services</th>
<th>Cultural Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish for consumption, wildlife habitat for hunting, wood for dwelling</td>
<td>Dense beech, sugar maple, hemlock forests prevented erosion and maintained water quality and supported habitat</td>
<td>Fish and aquatic habitat supported by healthy water, riparian areas, and forested lands</td>
<td>Connector to other regions and tribes</td>
</tr>
<tr>
<td>Animals for fur, large game, mills and dams harnessing river flow, diversion of water for Ohio &amp; Erie Canal, agricultural use of the flats</td>
<td>Extensive wetlands in the flats and tributary watersheds for flood and erosion control</td>
<td>Fish and aquatic habitat supported by healthy water, riparian areas, and forested lands</td>
<td>Transportation resource for agriculture and trade</td>
</tr>
<tr>
<td>Drinking water storage reservoirs, conduit for wastewater discharges, channelization for transportation</td>
<td>Development and building on wetlands and floodplains, dredging, industrial and municipal sewage pollution, erosion issues</td>
<td>Emergence of dead zones, adverse impact on fish and aquatic life, degraded terrestrial wildlife habitat</td>
<td>Transportation resource for commerce and industries, degraded aesthetics and impairments to recreation</td>
</tr>
<tr>
<td>Native plants providing habitat for local and migratory birds, improved water quality for fishing</td>
<td>Restoration of floodplains and wetlands, stream bank restoration, riparian buffer leading to less erosion and better flood control</td>
<td>Exceptional Warmwater habitat in main stem and tributaries, cold water habitat in tributaries, return of fish, aquatic life, and native birds</td>
<td>CVNP, local and state parks, towpath trail, and river water for recreational and cultural opportunities</td>
</tr>
</tbody>
</table>

Table 5.1: Ecosystem services provided by the Cuyahoga River watershed

The earliest use of the river was by the Native Americans who utilized the river valley and its forested lands for deriving food (through fishing and hunting) and other
provisions to create dwellings. The river being in a pristine state including densely
forested areas that performed key regulating functions such as erosion control, supported
a wide variety of habitats, and had an abundant supply of fish and large game. The
original vegetation in the watershed consisted of beech/sugar maple forests, supported by
its deep glacial soils. A presettlement forest area consisting of beech/maple/hemlock
association still thrives in the Tinker’s Creek gorge portion of the watershed. Culturally,
the river served as a connector and a trade route that connected the natives to other
regions (Ohio EPA, n.d.)

Major changes in the river watershed occurred with the advent of the European
settlers initially, and later due to industrialization and urbanization. Early European
settlers in the seventeenth and eighteenth centuries were mainly attracted to the region for
trapping and fur trading. The settlers originally used the ‘flats’ – the flat bottomland near
the mouth of the river – to settle, and eventually moved higher ground, using the valley
and the flats chiefly for agriculture. Extensive wetlands along the main stem of the
Cuyahoga in the flats and in the tributary watersheds performed the regulatory functions
of erosion and flood control. The topography of the valley and the Cuyahoga River water
offered opportunities for building dams to harness the power of water for sawmills and
gristmills and transportation of raw materials and finished products for a thriving
agriculture via the O&E canal. The Cuyahoga River, although supports many
provisioning elements such as food, wood, and transportation, it was never used as a
source of drinking water for the settlers in the valley. Groundwater has always been the
primary source of drinking water in the valley. However, the upstream areas of the river
(upper Cuyahoga), before it enters ravines and gorges, was designated as a public
drinking water source in 1911 and several reservoirs were built to provide adequate and safe drinking water to residents in the Akron area. As previously described, the falls, steep gorges, and ravines in the Cuyahoga River Valley made it unsuitable for transportation and the O&E canal was built by diverting water from the river in order to provide a reliable transportation system. The canal connecting the Great Lakes to the Gulf of Mexico via the Ohio River brought agricultural and trade prosperity to the Cuyahoga Valley. Powering of the mills, canal water diversions, dams, drinking water storage reservoirs, and the eventual building of wastewater treatment plants started affecting the flow and volume of water in the river, and its ecology and ecosystem functions (Linking Corridor, 1999; Ohio EPA, n.d.).

The advent of the railroads in 1850s sparked the beginning of the industrialization of the Cuyahoga valley and Northeastern Ohio, and led to the subsequent demise of the canal and the agricultural economy. The former agricultural landscape was taken over by an industrial one. Slowly a dense, developed urban environment emerged in the Cuyahoga Valley:

With the benefits of a geographic location midway between extensive deposits of natural resources, access to land and transportation networks, and the evolution of inter-related industries such as oil, chemicals and paint; sewing machines and clothing; and iron, steel, fasteners, machine tools, automobiles, and shipbuilding, the Cuyahoga Valley emerged as the setting for one of the most significant examples of industrialization and urbanization in America. (Northern Ohio Cuyahoga Valley Corridor Executive Summary, 1992)
To maintain smooth trade operations the mouth of the river was channelized straight into Lake Erie into the second half of the nineteenth century and early twentieth century. The 5.6-mile stretch flowing through downtown Cleveland (also the Flats area) started functioning mainly as a shipping channel. Industrialization and urban development brought unprecedented changes to the ecosystem and ecosystem functions of the river, some of which continue to this day. Industries discharged heavy metals, oils, solvents, polychlorinated biphenyls (PCBs), and other industrial pollutants causing adverse impacts to fish and aquatic life. Building of municipal sewers and sewage treatment plants along the river led to the discharge of high levels of biochemical oxygen demanding substances (BODs), untreated sewage, solids, ammonia, and phosphorus resulting in the loss of the river’s natural nutrient cycling functions, the lack of dissolved oxygen in parts of the river, and an increase in algal growth in Lake Erie. A portion of the river between Akron and Cleveland was even designated as a “dead zone” due to poor water quality and the complete lack of aquatic habitat (Linking Corridor, 1999; Ohio EPA, n.d.).

The channelization and annual dredging of the navigation channel and the construction of steel bulkheads along the riverbanks, making it accessible to commercial shipping, adversely impacted the habitat supported by the lower part of the river (see Figure 5.4). According to the Ohio EPA, some of the adverse habitat-related impacts in this segment of the river result from “physical factors such as continual dredging, steel shoring of banks, and the total lack of riparian buffer and shallow water habitat” (Linking Corridor, 1999, p. 1.10). Additionally, urban development on the floodplains, in the flats area and further upstream disconnected the river from its floodplains. Development on
the 100-year floodplains along the downtown channel affected the river’s ability to mitigate flood impacts. Rapid urban development upstream increased water runoff into the tributaries leading to sediment deposits in the river itself. Erosion caused by development and construction activities, riverbank erosion due to lack of riparian buffers and forested areas along the river, as well as combined sewer overflows (CSOs) that increase pollutants and bacteria into the river are issues that continue to affect the watershed (Linking Corridor, 1999; Ohio EPA, n.d.). As a result of these actions, the river lost most of its provisioning, regulating, habitat supporting, and cultural functions, leading to “degraded aesthetics and impairments to recreation due to debris and litter; degraded aquatic or terrestrial wildlife habitat due to a loss of wetlands and riparian buffer zones; and lack of recreational opportunities and access to the river” (Ohio EPA, n.d. p. 8).

Figure 5.4: Cuyahoga River sediment dredged and removed on a barge (Source: Cuyahoga County Planning Commission)

By mid-twentieth century the Cuyahoga River was highly polluted and caught on fire several times, including most famously, the 1969 fire that led to the passage of the
Clean Water Act of 1972. However, in the late 60s and early 70s the process of the recovery and restoration of the river had already started. The cleanup of the river started at the local level in the 1960s when the local industry and municipal leaders formed the Cuyahoga River Basin Water Quality Committee and started mobilizing funds for local cleanups (Adler, 2004). Some of the most notable changes came about through the passage of the Federal Clean Water Act in 1970, and Cuyahoga River watershed being designated as one of the 43 Great Lakes Areas of Concern under the 1972 Great Lakes Water Quality Agreement (GLWQA). In response to the regulations, industries stopped releasing pollutants into the river and cities along the river updated their sewage plants. Around the same time, in 1974 the Cuyahoga Valley was recognized as a unit of the National Park System. In 1988, the Cuyahoga Remedial Action Plan (RAP) Committee was appointed to address pollution problems affecting the beneficial use of the river in the Cuyahoga River Area of Concern (AOC).

Several key changes – environmental regulations and their implementation, the demise of industries, and local stewardship efforts – have improved the health of the river and its watershed and also restored some of its ecosystem functions over the past several decades. The river, though no longer a source of essential provisioning services such as food or wood/timber, has regained some of its regulating, habitat supporting, and cultural functions. The local movement in the greater Cleveland area to reconnect people with their natural resources played a significant role in shaping the restoration and recovery actions. The transition has been described as:

The cleanup of the Cuyahoga changed the way in which people viewed and used the river, and provided the impetus for significant economic development. People
valued the river again and started to initiate programs and projects to bring them back together. Parks, trails, and bike paths were built along its banks. Old industrial area warehouses were converted to housing and new commercial enterprises….People began to travel or relocate to areas where they could reconnect and recreate with the river (Ohio EPA, n.d., p. 7).

Four key elements brought this transformation in the watershed – the cleaning up of the river, the creation of Cuyahoga Valley National Park (CVNP), opening up of the Ohio and Erie Canal Towpath Trail (providing direct access to the river for the first time in decades in the Cuyahoga Valley), and community stewardship efforts.

Inclusion of native plants and grasses in replanting and restoration projects in vacant properties and along the river have led to higher quality habitats for local bird population, migratory birds and an influx of animals to the improved ecosystem (Linking Corridor, 1999). The river is in full attainment of exceptional warmwater habitat quality and has started supporting an array of wildlife, including diverse macro invertebrate and fish populations (NPS, 2016). The fish species that are sensitive to pollution such as redside dace and rainbow darter have started returning, demonstrating that most of the high pollutant levels have been eliminated and dissolved oxygen levels are sufficient to support such species (see Figure 5.5). Additionally, within the CVNP approximately 70 species of native fish are provided habitat by the Cuyahoga River its tributaries, creeks, and wetlands (CVNP, 2013).
The CVNP itself preserves numerous forested tributary watersheds, open grassy plateaus, townships and rural communities. The valley is still home to small, privately owned agricultural lands that supplying food to local communities and markets in the area (Ohio EPA, n.d.). Current and future restoration projects to connect the river to the floodplains in the downstream areas and identification and restoration of wetlands (areas that were developed by filling wetlands in the Flats) to minimize sedimentation and erosion effects and restore the regulating functions of the Cuyahoga River (CRR, 2016).

The provision of access to the river via the towpath trail, the natural historic, cultural, and recreational opportunities provided by the CVNP, the collection of city, county, and national parks around the river and its tributaries shifted the identity of the Cuyahoga valley (industrial wasteland to a resource benefitting the quality of life for the residents) and shaped its aesthetic and the recreational opportunities offered by it (see figure 5.6). Further, the extension of biking and hiking paths along the navigational section of the Cuyahoga, resurgence of paddling and canoeing activities in the ship channel and upstream (in the CVNP), along with birding and fishing opportunities have reshaped the landscape of the valley.
The Cuyahoga River has gone through several transitions and shifts to various regimes or states. Associated with each shift has been a change in the key ecosystem services. Mapping these stages and the ecosystem services associated with each is beneficial in assessing where the SES stands and what are the direct and the indirect benefits derived from the focal system. Mapping the ecosystem services and the change in the nature of these services is also helpful in understanding disturbances and stressors to the system and understanding how a system might function, any undesirable outcomes that might occur, and how a system might cope with such outcomes. The shifting nature of ecosystem services over regimes also gives an idea about the main ecosystem services that are of key importance (Resilience Alliance, 2010).

**Changes, Uncertainties, and Disturbances**

Shocks, disturbances, and uncertainties change a system. Processes at different scales and cross-scale interactions coupled with slow variables can push systems towards undesirable regimes. Disturbances disrupt a system and uncertainties regarding the nature, extent, and timing of such disturbances present challenges to the management of
SESs and the supply of ecosystem services. Therefore, in order to assess the resiliency and adaptive capacity of a system, understanding the disturbances that have historically affected the system, present disturbances of concern, and potential future disturbances is of significance. A broad view of systems including patterns of past disturbances and their impacts, and the change drivers behind them (e.g. natural, human interventions) – the historical profile of the system – is critical in revealing changes in the system resilience over time and planning for current and future management (Ernstson et al., 2010; Resilience Alliance, 2010).

The background and ecosystem services sections portray broadly the social-ecological profile of the Cuyahoga River basin, stressors and disturbances that led to the loss of ecosystem properties, and eventual recovery and restoration of the system and a substantial portion of its ecosystem services. The Cuyahoga River however, has been altered through human interventions to such an extent that the river is now in a fundamentally different regime than the pre-settlement era. As evident form the discussion on ecosystem services (also see Table 5.1), during the early settlement period, the river basin was undergoing changes in terms of slow variables or stressors such as diversion of water. Early industrialization, commerce leading to channelization of part of the river, and development pressure were slow variables that stressed the system, reducing its resilience. Further slow and incremental changes such as continued industrial growth and resulting pollution (e.g. maintenance of navigation channel, discharge of industrial effluents), urban development (e.g. land-use changes, loss of riparian buffers, loss of wetlands and floodplains) led to the river’s incapacity in sustaining its pre-settlement regime, resulting in a loss in the ecosystem properties associated with the
regime. The system moved towards an undesirable state, where the river caught on fire several times (between late 1800s and 1969), there were emergence of dead zones in the river (devoid of any aquatic life), and recreational and cultural opportunities that the river basin offered were severely affected. Clean up of the river had already started in the early 1960s at the local level, contrary to the popular perceptions (Adler, 2002). Growing local concerns about the Cuyahoga River by mid-twentieth century led to state pollution control efforts, and also created momentum for local action. The river eventually started recovering and slowly moved towards a new regime through a combination of a set of slow variables (e.g. waning of industrial use, local stewardship and action, planning activities) and disturbances (e.g. NPDES program). In this case, the disturbance moved the system towards a desirable regime. “The Lower Cuyahoga … may never be restored to pre-European settlement conditions, but it could be restored the high habitat and recreational standards that the Cuyahoga RAP has set for it” (Zeitler, 2001, p. 11). In this new regime, while some of the ecosystem services of the original system were lost, newer and distinct sets of ecosystem services began to emerge.

Some of the slow variables have continued to be part of the Cuyahoga river system since the beginning of the industrial era. These variables have the capacity to move the system towards thresholds (situations closer to undesirable states) and where disturbances can trigger the system’s slide towards undesirable states (Ernstson et al., 2010). Additionally, there are newer challenges that need to be recognized to avoid undesirable system transitions and build adaptive capacity. These slow variables and future changes and disturbances are described next.
Climate projections for the next 100 years in the region include forecast for hotter temperatures and higher precipitation. Climate models suggest that both temperature and precipitation are projected to increase by 2.4 – 3.8°C and 2% - 4% respectively. Cleveland would experience more than 60 days of above 90 °F and three weeks of days over 100 °F. Increasing temperatures could result in altered fish habitat. Potential alternations in vegetation due to climate change could shift forests from temperate mixed forests to temperate broadleaf forest. Some ongoing stressors and disruptions such as invasive species, river water quality degradation, increased rainfall events (more precipitation in winter and spring and less in summer) could exacerbate in the future leading to increased flooding and damage to historic structures, among others impairments (NPS, 2013). Overall heavy downpours are projected to become more common, resulting in an increased threat of flooding with greater incidences of flash flooding leading to property risk in tributaries of the Cuyahoga River (much like the devastating flood events in June 2006). Heavier downpour would also mean more CSO events, with the typical overflow from years past likely exceeded. There could be an increase in the frequency of short-term droughts (due to projected drier summers) leading to decline in water levels in streams, rivers, and lakes. Increasing temperatures, altered fish habitat, reduced water levels over summer and increased overall precipitation would affect recreational and commercial fishing, recreational opportunities in the Cuyahoga river and the CVNP, among other effects. Additionally, water levels in Lake Erie are projected to fall anywhere between 1-1.5 feet over this century. Such a change could lead to significant environmental, economic, aesthetic, and recreational challenges (U.S. EPA, 2016; GLAA-C, 2013; Union of Concerned Scientists, 2009).
Continued urban development and resulting land use changes are critical slow variables for the Cuyahoga River basin. An analysis of land cover in the tributary watersheds in 2001 shows that out of 12 tributary watersheds in the Lower Cuyahoga AOC one is severely damaged (e.g. channel modified, poor water quality, limited aquatic life), three are damaged (e.g. channel eroded, damaged banks, poor water quality, supports few species), seven are impacted (e.g. “flashy” streams, marginal water quality, can support aquatic life), and two are sensitive (e.g. healthy stream, good water quality, supports aquatic life). Between 1987 and 2002, although total population in the tributary watersheds of the Cuyahoga remained relatively stable, the level of urbanization has increased greatly in some watersheds. That is, the population in the region has dispersed into tributary watersheds without increasing. This pattern of urbanization increases urban flooding, degrades stream quality and green space within the watershed, damages riparian corridors, and puts pressure on water resources. Through floodplains and wetlands have been restored in some of the Cuyahoga River watersheds, an increased urbanization pressure might not consider the amounts or functions of the wetlands and floodplains. In such a scenario, changes in land use such as converting natural water absorbent features of the landscape into roads, rooftops, and parking lots coupled with increased and frequent rain and storm events pose significant threats (e.g. nonpoint source runoff, sediment runoff) to the Cuyahoga River, its tributaries, and downstream communities (Cuyahoga AHR, n.d.a).

The navigation channel part of the river is an important economic (via commerce, transport, commercial land use) and community asset for the region (via recreational opportunities). Under state law, the Cleveland-Cuyahoga Port Authority is responsible for
maintenance of commercial and recreational opportunities along the river channel. Some of the ongoing issues in this section of the river can be classified as slow variables.

Legacy sediments in the form of chemicals and industrial solvents bound to the sediments rest at the bottom of the riverbed. These sediments, even though don’t travel with the current, still need remediation or capping. The slow sliding down of the Irishtown bend hillside into the river is a continuing threat that could lead to environmental and commercial damage. Floating debris (e.g. tree trunks, tires, street trash mixed with raw sewage) that gets washed down to the river via storm drains is a continuing problem and has put the Cuyahoga River on a U.S. EPA watch list. Combined with increased storm events, high winter and spring precipitation (potentially leading to ice jams) could lead to adverse impacts. Dredging of the navigation channel by the U.S. Army Corps of Engineers (USACE) for maritime use and containment/disposal of the dredged material is an ongoing policy and management issue presenting an uncertain future.

And lastly, steel bulkheads along the 29,000 feet along the shipping channel are non-existent at places and in poor condition elsewhere (See Figure 5.7). Maintenance and replacing of bulkheads is important for maintaining the shipping channel, discouraging further development along the river, reduce pollution and runoff, and the control of flood in the flats area (Cleveland-Cuyahoga Port Authority, 2012).
Physical barriers such as dams and impoundments continue to affect full
restoration of river ecosystem by impeding transportation of sediments by the river and
disrupting fish migration. Dams alter river habitat by disrupting sediment flow and
creating artificial lakes or reservoirs in portions of the river. Removal of dams enable the
return of native aquatic species by restoring the natural habitat and sediment
transportation, creating variety of habitats for fish feeding, spawning and breeding, fish
reproduction, and fish migration upstream (NPS, 2013, Ohio EPA, 2013).

Continued threats to habitat in the watershed include urban development, invasive
and non-native species of fish, plants, and mollusks (e.g. Asian carp, zebra mussel) and
combined sewer events leading to high levels of bacteria. These threats limit and/or affect
recreational use and access in the park such as contact recreation after heavy rains.
Flooding, unstable soils, slumping, and riverbank issues also periodically limit
recreational access to the river and the CVNP (NPS, 2013; NPS, 2016).

The following sections and steps involve identifying biophysical and social
factors and governance and management influences in the watershed.
Key Drivers of Change and Governance and Management Attributes

Ecological (biophysical) Drivers

The discussion on ecosystem services and disturbances and uncertainties include both biophysical and social drivers that emerged from the grey literature on the Cuyahoga River watershed. To further narrow down the scope of the analysis, the observations and the interviews carried out were used to identify the key biophysical and social drivers. The Cuyahoga River watershed is an urban watershed that is integrated mosaic of “physical, ecological, political, and socioeconomic diversity” (Platt, 2006, p. 31). Most of the biophysical drivers associated with the watershed are related to land use development and infrastructure. Biophysical drivers or factors that emerged as important are climate and the physical environment and land use and its effect on urban hydrology, soils and sediments, and vegetation and habitat.

The International Joint Commission (IJC) in 1987 designated beneficial use impairments (BUIs) for each AOC under the Great Lakes Water Quality Agreement (GLWQA) in 1987. BUIs either restrict the use of waterways, or present obstructions/barriers to healthy fish populations, or impair or degrade water quality. The Cuyahoga River AOC had nine designated BUIs. Delisting from the AOC requires a restoration plan and actions geared towards removal or remediation of each if the BUIs (CRR, 2016; USEPA, 2016b). The BUIs that need to be addressed as part of remediation projects include continued CSO events and the presence of elevated bacterial levels in river waters, improvement of wastewater treatment, removal of dams within the AOC, and reducing the extent of impervious surfaces in the tributary watersheds, among others.
Over the years several of the BUIs have improved through policy, projects, and local action. The key management units for the Cuyahoga AOC (also the lower Cuyahoga River watershed) are linked to specific stressors and restoration and the biophysical drivers of change identified here overlap with these some of these stressors under the management units (CRCPO, 2008b).

Climate and the physical environment are one of the key biophysical drivers in an SES. An increase in mean average temperature and increased precipitation and intensity of rain and storm events will likely result in an increased threat of flooding, greater incidences of flash flooding leading to property risk in tributaries of the Cuyahoga River. Heavier downpour would also mean more CSO events, and the typical overflow from years past likely be exceeded (U.S. EPA, 2016; GLAA-C, 2013; Union of Concerned Scientists, 2009). The full extent of the effects of climate change on the physical environment in the Cuyahoga River watershed was discussed previously.

Land use and urban hydrology is a ubiquitous and key driver of change. Land use in terms of high levels of impervious surfaces leading to surface runoff, development pressure affecting wetlands, streams, and riparian and forested areas and resulting issues such as increased stormwater events, decline in terrestrial and aquatic habitat, degraded riparian vegetation due to isolation from water table, and increased CSO events (Pickett et al., 2001). Effective management of an urban watershed would include practices such as low impact development, green stormwater BMPs, litter clean up and monitoring, restoration of natural flow through dam removal, wetland restoration, and stream day lighting (Platt, 2006). The Cuyahoga River watershed has a history of intensive land use development related to industrial, trade, commercial, and residential uses since the
settlement era. These uses have altered the landscape of the river basin in unprecedented ways. Future development pressures such as growing and/or dispersing communities, and managing stormwater drainage from major freeways in the area are key concerns in some of the tributary watersheds such as the Brandywine Creek. Other issues that have emerged as important for the Cuyahoga River watershed are: CSOs, reduction of stormwater runoff through low impact development, green stormwater BMPs, maintenance of bulkheads in the navigation channel, wetland and stream restoration, and dam removal.

Combined sewer overflows (CSOs) have been a persistent issue in the watershed. High levels of urbanization and resulting imperviousness, ageing combined sewer infrastructure, and significant rain events lead to overflow of combined sewage into the Cuyahoga River. CSOs are associated with bacterial impacts and algal toxins, nutrient loads and other contaminants, litter and debris, and aesthetic impairments. Current and future green stormwater infrastructure and low impact development projects in the Cuyahoga River watershed would help in reducing CSO discharges and bacterial levels. Reducing the volume of runoff by retaining stormwater on sites through permeable paving and subsurface storage, increasing forested areas, bio swales and rain gardens is a key planning target. The Northeast Ohio Regional Sewer District (Sewer District) and the City of Akron are implementing a long-term control plan (e.g. storage basins, interceptors, large tunnels) for CSO reduction in the Cuyahoga AOC management area (CRR, 2015; CRCPO, 2008b). Litter and debris washed down by storm and CSO events into the Cuyahoga River is being address by the Port Authority. Maintenance of the bulkheads along the navigational channel to reduce pollution runoff by attracting
investment, spurring development, and providing added benefit is a key focus area of watershed management (Cleveland-Cuyahoga Port Authority, 2012, CRR, 2015).

As discussed previously, dams pose impediments to the free flow of sediments and fish movement affecting aquatic habitat and stream health. Dams and their upstream impoundment (Station Road/Brecksville dam and Gorge dam) areas have been identified along the main stem of the Cuyahoga River as sources of impairment. Removal of these dams will help in restoring historical flow patterns and additional restoration actions will be required to manage altered stream flow and impacts on aquatic habitat and to restore the area to natural conditions (CRCPO, 2008b).

Land use patterns and development directly influence habitat quality for fish, aquatic species, and terrestrial species in the Cuyahoga River watershed. For example, flashy streams deliver sudden runoff and cause increased erosional activity. Small watersheds are especially highly affected by land use changes, although smaller streams can also be addressed more easily through retrofits, restoration, and habitat restoration. West Creek in the Cuyahoga River watershed is an example of such a flashy stream. Riparian setback ordinances, riparian restoration projects (carried out in West Creek and Big Creek), and riparian preservation (through land acquisition via conservation easements) are integral actions undertaken to manage riparian and stream habitats (Cuyahoga RAP, 2012; Cuyahoga AHR, n.d. a).

Urban soils (and sediments) are integrally linked to urban ecosystems and communities that shapes land use and is also affected by it. Soils retain and supply nutrients, support flora and fauna, absorb and stores water, and also intercept contaminants (e.g. pesticides and toxins generated through human activities). Soils are
also altered by human activities and land use. High urbanization leads to significant modification of soils through physical disturbances, addition of chemicals and water, deposition of debris, and higher concentrations of toxins such as heavy metals (Pickett et al., 2001). The Gorge dam on the Cuyahoga River contains legacy sediments in need of remediation along with removal of the dam. Removal of legacy sediments in the navigation channel is also a key threat to the river ecosystem and communities in terms of recreational access. Sediment loading from upstream areas resulting from land disturbances, development activities, and agriculture leads to erosion and higher sediment and nutrient loadings in the river and its tributaries. Sustainable sediment management activities such as restoration projects (e.g. Sand Run restoration project) helps in reducing erosion and sediment loadings into the Cuyahoga and restoring aquatic habitat by connecting streams back to the floodplains (CRR, 2015).

**Social Drivers**

Social factors that emerged as important are geo-political complexity and watershed based land use planning, the river as a means of economic production, demand for recreational access and opportunities, stream and watershed stewardship activities by communities, community and public education (awareness-building), and trust among actors and presence of strong community and social networks.

*Geo-political complexity and land use planning.* Urban watersheds have complex management issues because of the involvement of multiple political jurisdictions and entities. Metropolitan watersheds, such as the Cuyahoga, are politically fragmented “streams cross political boundaries and sometimes serve as boundaries between municipalities, counties, or even states” (Platt, 2006, p. 29). Moreover, areas
within a watershed might have great social and economic diversity that indicate, “although watersheds can be integrative spatial units based on geomorphology, they do not always include unified human communities” (Hardy & Koontz, 2010, p. 83). In Ohio, where the municipal home rule gives local political jurisdictions (e.g. townships, counties, charter municipalities, and non-charter, or statutory plan, municipalities) all authority to regulate any land use planning or zoning and poses difficulties for inter jurisdictional watershed planning and collaboration (Shwab, 2010).

The Cuyahoga River AOC itself (also the lower Cuyahoga) includes 45 political jurisdictions (cities, villages, and townships). Watershed based planning crosses political jurisdiction lines and implementing such planned projects has been argued to conflict with the home rule. “The idea that local affairs should be determined locally— the basic proposition of home-rule—is deeply engrained in the politics of Ohio’s local governments” (Shwab, 2010, p. 492). Therefore for innovative land use changes, reformers (e.g. land use planners, lawyers, environmentalists, politicians) argue for “voluntary” or “incentive-based” plans that wouldn’t require mandatory action from municipalities. The Balanced Growth watershed planning is one such effort in Ohio and there are several balanced growth subwatersheds in the Cuyahoga River watershed (see next section for details) (Shwab, 2010). A number of restoration, conservation, surface water improvement, stormwater management, and green infrastructure projects have been carried out over the past decade in various municipalities, villages, and townships in the Cuyahoga River tributary watersheds (CRR, 2015; OEPA, 2015). While these projects have restored the beneficial uses of streams, wetlands, and public and private properties, carrying out these projects doesn’t conflict with the jurisdictional home rule. Watershed
managers however, recognized that the effective management of complex, amorphous, and migratory nature of nonpoint source pollution and limiting the effect of local land use decision on neighboring watersheds requires a holistic, rather than a “spot” improvement approach. Such an approach would rest on mandatory watershed planning (as voluntary efforts fail to reduce nonpoint source pollution to the federally mandated standards) and collaboration with neighboring communities (Shwab, 2010).

**River as a means of economic production.** As described in the section on *Ecosystem Services*, the Cuyahoga River valley and the lower watershed has always been an economic anchor for Cleveland and northeastern Ohio. From the point of view of economic geography, the Cuyahoga River made it possible to build a water-level connection between the Ohio River and the Great Lakes via the Ohio and Erie Canal (The Encyclopedia of Cleveland History, 1998).

![The Flats, Cuyahoga River and Valley, 1900-1929.](image)

**Figure 5.8: The Flats, Cuyahoga River and Valley, 1900-1929.** (Source: Michael Schwartz Library at Cleveland State University)

Between the Civil War and the onset of the Great Depression, the rapid accumulation of capital, influx of capital that converted into greater productive capacity,
and industrial and commercial infrastructure arose from great industrial powerhouses such as Standard Oil, American Ship Building, Republic Steel, and the Sherwin-Williams Paint Company, all clustered in the downtown section or lower part of the Cuyahoga River. Factories, warehouses, docks, and railroads dominated the waterfront in the Flats (see Figure 5.8). The workers in these industrial and manufacturing facilities lived in the neighborhoods flanking the river, by the industrial zone (Stradling & Stradling, 2015).

![Figure 5.9: The Cleveland Flats and riverfront uses, 1950-1959 (Source: Michael Schwartz Library at Cleveland State University)](image)

Stradling & Stradling (2015) eloquently describe the influence of the river as a means of economic production as:

The city and individual businesses reshaped the river, dredging, widening, straightening, and holding it back, all in the effort to make it more useful for industry by allowing the passage of ore boats upstream to the southern flats, where great steel mills produced the raw materials that attracted even more factories to the region…industrial capitalism didn’t just manufacture widgets in Cleveland; it manufactured Cleveland. (p. 5)
All the industrial capitalism in Cleveland was centered on the Cuyahoga River, the river historically being a means of economic production for the region. Every square inch of space in the Flats was taken up by productive uses (see Figure 5.9). The infrastructure around the river in this area had a clearly assigned use for serving the property owners along the river, which were private industrial and commercial enterprises (Zingale, Riemann, & Liggett, 2014). As the larger economic and political forces became more fluid in terms of capital, labor, and sites of production, with manufacturing and commerce not dependent on economic geography of a place (Stradling & Stradling, 2015), and the subsequent deindustrialization forces that swept through Cleveland, the lower river and the Flats continued to go through its stages of production and reproduction of various types of economic uses.

During the late 1980s and 1990s, when Cleveland was well into its deindustrialized reality, the Flats and the lower watershed refashioned itself into an entertainment district, side by side with the manufacturing and commercial operations that remained. Nightclubs, restaurants, pubs, and entertainment venues dominated the earlier industrial and commercial warehouse spaces (see Figure 5.10). The semi-public spaces owned and determined by the entertainment district business owners, created an economic and use value for the public (Zingale et al., 2014).
The lack of neighborhoods ties and residential and public spaces in the area, however, led soon to the demise of the entertainment based economic uses in the area. A County Planner explained the end of the exclusive entertainment district in the Flats:

Flats at that time [1980s and 1990s], it was called the Special Improvement District and those bar owners they were there just to make money and nothing else, and said that was the City’s problem and it started to look terrible down there. I used to work at the warehouse district and I saw that there were break-ins all the time, there was glass everywhere, and people would steal cars. It was like the Wild West, it was just anything goes. So one by one those places went out of business, the police were citing underage drinkers, and so one by one things started to close and it just kind of fell apart. (Personal Communication, 2015)

But a repurposing of the Flats once, and the potential that it created, had planted the vision in the minds of local actors that the downtown stretch of the river can be reimagined to a variety of purposes. More recently, the shift in larger economic and social forces in the form of new competition for capital investment in service industries

Figure 5.10: Cuyahoga River Flats entertainment district, 1960-1990 (Source: Michael Schwartz Library at Cleveland State University)
such as banking, insurance, education, and healthcare has shaped the landscape of economic production along the Cuyahoga River in a different manner than what it had been historically (Stradling & Stradling, 2015). Driven by people/citizens that demanded better recreational, housing, public access, and clean water opportunities, the city has reclaimed its waterfront, and created opportunities for a mixed-used district that consists of multiple-uses of the river and the Flats such as by entertainment, commercial, industrial, residential, industrial, and maritime sectors (see Figure 5.11).

![Cuyahoga River and the Flats today](Source: Share the River)

**Figure 5.11: Cuyahoga River and the Flats today.** (Source: Share the River)

**Demand for recreational access and opportunities.** Recreational access and aesthetic benefits are key ecosystem services provided by urban SESs. Recreational opportunities in urban SESs depend on ecological characteristics (e.g. clean water, aquatic and terrestrial habitat, forested areas) and social criteria such as accessibility,
penetrability, and safety. Aesthetic benefits from urban parks and forests are associated with reduced stress and increased physical and mental health. Impairments in urban streams and rivers represent a loss in ecological service in terms of provision of recreational opportunities and aesthetic benefits (Gómez-Baggethun et al., 2013; Platt, 2006). The Cuyahoga River (lower Cuyahoga) and its tributaries, trails, the O&E Canal Towpath Trail, city and county parks, and the CVNP provides opportunities for paddling and canoeing, fishing, hiking and biking, birding, and many more (see Figure 5.11). These recreational opportunities that are readily available to watershed residents and non-residents have helped in restoring the once lost connection with the Cuyahoga River. Though there are several areas in the CVNP and in the lower Cuyahoga that do not meet standards for contact recreation, especially after heavy rains, with an overall improvement in the water quality, there has been an increase in demand for trail and recreational opportunities. This has created potential for regional partnerships and a recreational plan – River Use Management Plan – for the navigable portion of the Cuyahoga with various groups and agencies with either jurisdictional responsibilities or special interests (CRR, 2015; Linking Corridor, 1999; OEPA, n.d.).

Demand for recreational opportunities and increased access and current unmet demand for water-based recreation are factors that also shape much of the governance and planning in the Cuyahoga River basin today. This happens via setting recreational contact and access as targets for policies, and directing planning and management efforts towards this access. An example of this would be improving contact recreation by managing the levels of bacteria in the water through policies (e.g. local land-use and zoning, and CSO control) and project and management activities (e.g. stream restoration,
Recreational use and access is integrally linked to and furthers the importance of watershed stewardship and community engagement (e.g. volunteer activities, stream cleaning, tree planting, etc.) (Linking Corridor, 1999; NPS, 2013).

**Stream and watershed stewardship.** Watershed stewardship in the Cuyahoga River Basin has emerged as a key stormwater management strategy via tributary watershed partnerships and a means to mobilize local policy and community action. In the wake of an unprecedented flood event in the Cuyahoga Valley in 2003, the CVNP’s then superintendent John Debo, stressing the importance of watershed stewardship noted, “the need for better care of our watersheds is becoming increasingly apparent to both citizens and public officials.” Watershed stewardship (also termed as civic environmentalism, urban ecological stewardship, ecological restoration, or civic ecology) “involves nonprofit groups and government in restoring nature in cities through such activities as planting trees along river corridors, community gardening and recreating native wildlife habitat” (Krasny & Tidball, 2009, p. 465-466). The emphasis of these activities is on restoration and stewardship practices. Stewardship activities and process is integrally linked to governance and management efforts (e.g. formation of tributary watershed organizations, and decision making processes in local governments such as adoption and enforcement of riparian setback ordinances and wetland setback ordinances) and to other social factors such as promotion of public education, and creation of social networks (or networks of trust) (Krasny & Tidball, 2009; Tinkers Creek Watershed Partners, n.d.). Tributary watershed partnerships such as Tinkers Creek Watershed Partners, Big Creek Connects, and West Creek Conservancy have acted as stewards for
the tributary watershed communities and explicitly outline public education and community stewardship actions as part of their organizational mission and goal.

The Cuyahoga RAP and the tributary watershed partnerships have engaged the local watershed communities in stewardship and restoration of natural environments along the river, used volunteers to implement programming activities, conservation and restoration projects (e.g. stream cleanups, stream monitoring activities), recognized opportunities for green space enhancement, understood the sources of local stressors on streams (along with the community residents), and began educational initiatives in schools and communities. Lastly, joint watershed stewardship activities by neighboring communities have fostered regional relationships in the Cuyahoga River watershed. These relationships have the potential to improve efficiency for delivering community services, lowering costs and stabilizing funding sources (for plans and projects), and overall strengthening the metropolitan economy (Cuyahoga AHR, n.d. b, Tinkers Creek Watershed Action Plan, n.d.; NPS, n.d.). One such example is the formation of the Central Lake Erie Basin group, a governance mechanism as well as a consolidation of individual tributary stewardship actions into a regional partnership. The group was initially created as an informal mechanism to share ideas and expertise such as having a coherent message for public education and outreach or creating an inventory map of expertise, personnel, equipment and supplies to identify specialties within each watershed partnership. Over time this effort has formalized into a more structured initiative where the individual watershed groups have their own municipal support base (they still function as the tributary watershed partnerships), but scale their efforts to a regional level under this new group/initiative. This collaboration at a regional level would improve
efficiencies. For example, they work on regional level grants and increase effectiveness of program implementation based on strategic competition (Personal Communication, 2015).

Community and public education. Education of the local communities through public outreach has emerged as a key focus of the Cuyahoga RAP and the watershed groups. The role of public education and outreach in watershed management by public agencies, planning entities, and watershed partnerships has been widely recognized. Education and outreach is part of the solution of resource management itself by acquiring public support through the process (Leach, Pelkey, and Sabatier, 2002). It has also been argued that stewardship practices, public and environmental education, and the ecological health and outcomes from a system mutually reinforce each other. Further, it is not just a focus on education for responsible behavior that leads to immediate environmental outcomes (e.g. rain garden workshops, stream restoration workshops and courses). By emphasizing the need to develop the capacity to make decisions and change learning strategies when faced with environmental dilemmas as well, education can be used to build resilience in SESs (Krasny & Tidball, 2009; Krasny, Lundholm, & Plummer, 2010).

In the Cuyahoga River watershed, evidence of both forms of environmental and public education is visible. Watershed based education includes partnerships with higher education institutions (e.g. Cuyahoga County Community College) and local high schools to create opportunities for students for classroom education and hands on experience with projects such as water quality analysis, wetland restoration, rain garden installation, and research projects (e.g. water quality, fish health, macroinvertebrate population).
Providing public and community education and encouraging educational opportunities is a key focus of watershed managers in the Cuyahoga River tributary watersheds (Tinkers Creek Watershed Partners, n.d.; West Creek Preservation Committee, 2005). “Outdoor education, passive recreational activities, and interpretive initiatives provide experiences for environmental learning, and present opportunities to emphasize the concepts of watershed connectivity and protection, the influence of grassroots efforts, the importance of proper stewardship, and restoration of natural systems in urban environments” (West Creek Preservation Committee, 2005, p. 125). Additionally, the Cuyahoga River Restoration (earlier Cuyahoga River Community Planning Organization) has provided education and outreach materials and support to watershed communities and stakeholders as part of its organizational mission, and also provides training to agency personnel and local officials on watershed protection and management. Trainings, tours, workshops, and symposiums conducted either individually or collaboratively by organizations and agencies such as the Cuyahoga AOC (coordinating committee that manages the AOC program), Cuyahoga County Board of Health, Cuyahoga Soil and Water Conservation District, and the Northeast Ohio Regional Sewer District, provide iterative learning opportunities and platforms to share knowledge and reflect on management practices among watershed managers, community stakeholders, and public officials. Examples of these activities are the annual Cuyahoga River Symposium, watershed project tours, and stormwater management trainings through the Northeast Ohio Stormwater Training Council.

**Community and social networks.** Social capital including social norms, and relationships among citizens, and trust between community members and watershed
management agencies are significant factors in producing effective watershed management outcomes (Sabatier et al., 2005; Hardy and Koontz, 2010). As mentioned earlier, the lower Cuyahoga River watershed consists of 45 political jurisdictions and social capital plays an important role in driving watershed management activities in the region. Levels of social capital have been recognized as determinants of success for watershed partnerships (Sabatier et al., 2005). The lower Cuyahoga River and its tributary watersheds and the political jurisdictions within those have historically had intensely urban land use. Yet, each tributary watershed and its communities have unique social and cultural elements and resources. Therefore, even though the lower Cuyahoga is only about 50 miles in length, there are five established watershed partnerships in the region (for tributary watersheds of Tinkers Creek, West Creek, Big Creek, Mill Creek, and Yellow Creek). Four of the tributary watersheds have created Balanced Growth plans and partnerships (Big Creek, Chippewa Creek, Furnace Run, and Brandywine Creek). Some of the staffed watershed partnerships receive organizational support from the Sewer District (under their watershed partnership support program) and local municipalities (CRR, 2015).

In addition, cities of Cleveland and Akron and organizations such as Cleveland Metroparks, Summit Metroparks, and Cuyahoga River Restoration provide planning and management assistance throughout the watershed. The presence of community stewardship organizations and the support provided by the municipalities, park districts, and local government agencies forms a strong interorganizational network for watershed management. The presence of a social capital base can be described by a CRR (2015) report as:
Although the sheer size of the AOC, the amount of urbanization, the range of impacts, and the lingering effects of previous contamination present challenges to restoration, the great number and wide variety of partners, stakeholders, and stewards, with unique contributions and exceptional levels of committeemen and resources makes delisting the Area of Concern within the foreseeable future a distinct possibility [original emphasis] (p. 5).

The watershed partnerships by their very nature serve as venues for direct citizen participation in watershed decision-making and management. The partnerships have their own community base and by functioning at the scale of tributaries, understand the unique environmental and socio-political conditions in their geographic area of focus. This connecting with community members through watershed partnerships led to social outputs such as community awareness and improved communication. Maintaining a supportive community base, and working overtime with local watershed residents and public and nonprofit organizations has helped the watershed partnerships build trust among actors and stakeholders and network of community partners. This process, along with formation of interorganizational networks with organizations within and outside the tributary watersheds led to environmental outputs such as wetland restoration, dam removal, stormwater management, land conservation, and trail planning and development. Most recent environmental outputs from the work of the watershed partnerships and their collaboration with other organizations and communities leveraged Great Lakes Restoration Initiative (GLRI) funding, and included tributary restoration in Tinker’s Creek, neighborhood stormwater initiative in West Creek (Parma), Cuyahoga
River fish restoration project, urban waterways debris removal project, and Big Creek watershed stormwater management improvement (Gershman & Alexander, 2012).

**Governance and Management Attributes**

The effort to restore the health of the river over the past four decades has come about not just through top-down policy efforts and implementation of federal mandates, but also through concerted local action. Management challenges in restoration and regeneration posed by a complex urban watershed like the Cuyahoga River has involved coordinated action by a range of stakeholders including organizations and government agencies at the federal, state and local levels, nonprofit organizations, private businesses and individuals. Governance in the Cuyahoga River watershed is self-organized, within which the formal lines of authority are blurred and a diverse group of actors come together to focus on common problems. Several networks operating in the watershed helped to stimulate collaboration, build trust, provided information and encouraged the development of a common perspective.

![Watershed management arenas](image)

**Figure 5.12: Watershed management arenas** (adapted from Muñoz-Erickson et al., 2010)
From the data analysis, I discuss three broad areas of management based on federal and state policies that emerge within the overall governance of the Cuyahoga River. These arenas are pollution control and mitigation, protection and restoration, and economic redevelopment and revitalization (see Figure 5.12). Each management arena has its own sets of actors and networks, while several common key actors influence operate in multiple arenas over the entire watershed. These are described below.

**Pollution Control and Mitigation.** While the Clean Water Act (CWA) 1972 provisions apply to the complete river (lower, middle, and upper parts), the main focus of control, mitigation, and remediation activities has been on the lower Cuyahoga River. CWA implementation has been driven through a process of “cooperative federalism,” symbolic of the era of “command-and-control” institutions (Lubell et al., 2002; Sabatier, Weible, & Ficker, 2005). New secondary sewage treatment facilities Cleveland and Akron funded through the CWA provisions greatly improved water quality. In addition, the National Pollutant Discharge Elimination System (NPDES) permit program helped reduce industrial discharges from facilities through technology based effluent limitations (Andreen, 2003). The Total Maximum Daily Load (TMDL) for each section of the river specifies the amount of the pollutant that needs to be reduced to meet the water quality standards, assigns pollution load reductions, and provides guidance in taking actions to restore a water resource (Tuckerman & Zawiski, 2007).

Governance of the Cuyahoga River has a more complex story that goes beyond the conventional command-and-control regimes at work at the time. Contrary to popular perceptions, local efforts were at play much before the CWA regulations came into
existence. By the early 1960s local government, business leaders, and journalists had started taking steps to address the pollution problems in the river, driven by a “strong sense of place” and a desire to protect the places that were frequently used for recreational purposes (Adler, 2002). These were the first evidences of multi-actor governance for the river. However, the main policy drivers influencing pollution remediation and control have continued to be structured by federal law, and have undergone only modest alterations since their development in the 1970s (Hoornbeek, 2011).

The 1987 amendments to the CWA, also known as the Water Quality Act (WQA), made reduction of nonpoint source pollution a national goal and ushered in a more collaborative era in watershed management, with a “place-based management” approach, marked by the involvement of multiple stakeholders representing diverse interests treating each other equally. Formation of watershed partnerships for developing TMDLs and design and implement plans and projects also started becoming a norm in watershed management (Sabatier, Weible, & Ficker 2005, p. 47). Here, Congress defined the “institutional environment that structures the water quality protection opportunities” available to watershed groups and collaborations (Hoornbeek, 2011, p. 242). This era encouraged participation by a broader variety of stakeholders representing multiple interests, serving to bridge agency specific scientific knowledge with the local knowledge (Sabatier et al., 2005). Lubell et al. (2002) noted the focus on watershed scale expanded the network of actors involved in policy-related processes and helped create innovative policies, programs, and initiatives that are more congruent with local watershed efforts.
The shift in management environment created by the WQA consolidated the coordination among diverse set of actors that was also present in the Cuyahoga River watershed and helped facilitate newer partnerships and collaborations. The Remedial Action Plan (RAP) program has been one of the key efforts for management of pollution in the Cuyahoga River watershed. RAPs are a series of community-based efforts for cleaning up the most contaminated rivers and harbors in the Great Lakes basin, created through the 1987 amendments to the Great Lakes Water Quality Agreement (GLWQA) between the United States and Canada. The International Joint Commission (IJC), a bi-national panel appointed by the two governments, coordinates the GLWQA. The Cuyahoga River was one of the original 43 Areas of Concern (AOC) designated under the agreement. Three key features of the participatory nature of the RAP process are: “1) the use of stakeholder advisory committees; 2) the focus on planning; and 3) concentration on remediating pollution” (Beierle & Konisky 2001, p. 516). The IJC’s focus on an ecosystem approach for the RAPs fostered watershed-scale planning, thus requiring a coordinated and integrated approach. Development of remedial action plans is supported by the federal agencies (USEPA in the US), but implementation of recommendations is funded through existing agency or local resources. Thus, the RAP process takes advantage of the unique needs and resources of an AOC and encourages stakeholders (representing societal, economic, and environmental interests), technical experts, and government entities to restore the beneficial uses of an impaired resource (Beierle & Konisky 2001; Hartig & Law 1994; Hartig et al. 1998; Kellogg 1998).

The Cuyahoga River RAP focuses on the Cuyahoga Area of Concern (AOC) designated as the lower Cuyahoga River (onwards from Akron) including the six-mile
navigation channel in downtown Cleveland leading up to the river’s mouth at Lake Erie.

The Cuyahoga RAP has two broad functions: 1) remediation of existing pollution and prevention of future pollution in the lower Cuyahoga; and 2) plan and promote restoration and other beneficial uses (NPS, 2014a and NPS, 2014b). The institutional structure of the Cuyahoga RAP, as with the RAPs in other AOCs, builds community ownership of the RAP, provides the structure for an inclusive planning process, and provides the capacity to leverage resources (Hartig & Law, 1994). The Cuyahoga River RAP Coordinating Committee (RAP-CCC) was formally appointed by the Ohio Environmental Protection Agency (Ohio EPA) with stakeholders representing business, relevant government and regional agencies, community groups, individuals with an interest in the river, and tributary-based watershed groups. The Cuyahoga River Community Planning Organization (CRCPO) was formed by the RAP-CCC as a nonprofit affiliate to encourage additional stakeholder engagement in support of the RAP. The AOC program in Ohio has recently been restructured and the CRCPO was renamed as the Cuyahoga River Restoration (CRR). The original intent of the RAP was pollution mitigation and control through defining and tracking remedial actions required to remove contaminants from the AOC that reduce beneficial use impairments (BUIs) so the Cuyahoga River could be removed form the AOC list. However, over the years, a watershed approach was adopted to address the full range of BUIs associated with the AOC’s entire watershed. The role of RAP-CCC by necessity also expanded management activities beyond the goal of pollution control and mitigation to engage in other watershed management activities.
The WQA added water quality standards for toxics and introduced nonpoint source pollution (NPS) into its regulatory framework that required states to expand programs to address nonpoint source pollution and wetlands. This was done largely through sections 208 and 319. The section 319 program provides financial support for nonpoint source pollution mitigation and among other things, funds the creation of watershed action plans (WAPs) by local watershed groups. WAPs itemize the problems, priorities, and activities that local watershed groups need to address (Ohio EPA, 1997). The WAPs help in accurately identifying pollutants and pollution sources that help guide strategies to reduce water quality impairments caused by NPS pollutants (Hardy and Koontz, 2008; Shwab 2010). To this end, section 319 programs play a key role in supporting various community-based tributary watershed groups to develop WAPs. The CRR coordinates this process to reduce BUIs identified in the AOC and move the Cuyahoga River closer to delisting goals (CRAOC, 2015b). Since the Cuyahoga River watershed is made up of 26 smaller watersheds, each with unique landforms and characteristics, the CRR resolved that each sub-watershed needs its own action plan (CRAOC, 2015b; OEPA, 1997).

Protection and Restoration. In addition to pollution abatement, mitigation actions include continuing efforts to seek improvement in the health of the river through habitat restoration, conducting scientific assessment studies on dissolved oxygen and larval fish in the river and the navigation channel, stream stewardship, wetland identification and restoration, urban storm water management, and comprehensive environmental education and community involvement (USEPA 2014). Designations such as the Cuyahoga Valley National Park, Cuyahoga River as an American Heritage River, and the Ohio & Erie
Canalway is a National Heritage Area brought in essential financial resources to plan and implement restoration actions throughout the lower river watershed.

The Cuyahoga Valley was recognized as a recreation area in the national park system in 1974. These 33,000 acres of the Cuyahoga River watershed between Cleveland and Akron were designated as the Cuyahoga Valley National Park (CVNP) in 2000. In contrast to other national parks, the CVNP contains private land and local government jurisdictions, and is being created over time through purchases of land and long-term leases, gradually bringing more land under federal control. The CVNP is known for its unique and innovative management style, culture of partnerships, and public engagement. The park functions through its network of formal and informal partnerships with local organizations (NPS 2013). The Cuyahoga River was designated as one of 14 “American Heritage Rivers” by a federal executive order in 1998. The purpose of this designation is to support community based efforts to protect natural resources, stimulate economic development, and preserve historic and cultural heritage along the river. The initiative has managed to create a network of partner communities and stakeholders to work on sustainability issues along the length of the river (USDA Forest Service, 2005).

One of the key state level programmatic efforts for the protection of the watershed was in the form of Ohio Balanced Growth Program (BGP) of the Ohio Lake Erie Commission (OLEC). The BGP uses state-level incentives and technical assistance to encourage local governments to assist in maintaining the health of the Lake Erie and its watershed. Through the program, Balanced Growth partnerships are formed among local governments and stakeholders in sub-watersheds. The local governments in a watershed designate priority development, conservation and agricultural areas, thereby bringing a
watershed approach to urban planning and zoning. Participation in a balanced growth planning partnership and planning process, and adoption of the objectives of the plan into local zoning and other policies, qualifies the local governments for priority receipt of funding and technical assistance. The BGP is different from other watershed management approaches as the role of local governments is more central to this process than in other watershed efforts in Ohio (Kellogg 2009; Shwab 2010). The Cuyahoga River contains five subwatersheds with completed Balanced Growth Plans. The BGP directed actions are an overlay on the existing watershed projects and actions, and further consolidates collaborative and partnership based activities. The networks and collaborations that are created for the balanced growth partnerships draw from the larger network of governance actors in the Cuyahoga River.

**Economic Redevelopment and Revitalization.** Uninterrupted navigation in the lower river channel is recognized as critical to the economic sustainability of the Cleveland region. The U.S. Army Corps of Engineers is the federal agency that is responsible for planning, maintenance, and evaluation of the dredging operations in the navigation channel. As required by the National Environmental Policy Act (NEPA) of 1970, the Corps consults with two federal agencies (U.S. EPA and the U.S. Fish and Wildlife Service), state agencies (the Ohio Department of Natural Resources (ODNR) and OEPA), and local agencies (Cleveland-Cuyahoga Port Authority) to work on the maintenance of the navigation channel under the Cleveland Harbor, Ohio Federal Navigation Project (USACE 2009). The RAP-CCC collaborates with the Port Authority and agencies to develop new approaches for sustainable sediment management (CRAOC 2015a).
Economic activities related to the navigation channel section of the river has been mainly industrial in nature, owing to the Standard Oil company and dozens of steel and chemical industries located there through the mid-twentieth century. The presence of the ArcelorMittal Steel, Zalcon chemicals, Morton salt, Cargill Salt, Great Lakes Towing Company, and a variety of other commercial and manufacturing facilities still predominate in bringing value to economic production. However, the prolonged de-industrialization of the area over past decades has also left a legacy of empty warehouses and production facilities, brownfields, and regenerating natural areas. Today, new …activities are changing the landscape. These new economic activities focus on the lands adjacent to the river (housing, parks, entertainment venues) and direct use of the river for rowing clubs and pleasure boating.

The changes that have been taking place in the industrial “flats” are a result of several planning initiatives with distinct and different purposes, but overlapping implications for the valley. The North Cuyahoga Valley Corridor Plan, completed by the Cuyahoga County Planning Commission 1992, set forth the first coordinated conceptual plan for recreation, open space, and quality of life projects that had been completed or were underway at the time. This plan was the first evidence that the vision of the Cuyahoga River was shifting from domination by industrial and navigation interests. More recently, the Flats Forward Governance and Visioning Initiative was formed as a coalition of organizations brought together under the leadership of a local city councilman. This new process reflects the continued substantive transformation in thinking about the revitalization of the river valley/corridor. The Initiative includes representation from environmental, commercial, recreational, residential, and industrial
groups to participate in the governance of the river corridor. It is important to highlight that while important and changes have come about in terms of newer residential, commercial, and environmental assets such as the completion of the Flats East bank, Cleveland Metroparks’ Rivergate Park, and the completion and opening of the Scranton Flats/Towpath Trail, significant challenges still remain. These challenges present mostly in the form of fragmented responsibilities related to planning, development, and maintenance of the river and property around the river in the Flats area (officially within Cleveland municipal limits). Specifically, difficulties in dealing with land assembly, public funding, and polluted brownfield sites (erstwhile industrial) have been the key challenges, in spite of collaborative efforts.

The momentum built through collaborative work on various water quality and restoration projects in the watershed has led to the governance actors exploring newer projects, and leveraging new and different funding and partnership resources to meet water quality and habitat goals, even in the shipping channel. For example, the CRR and Canalway Partners brought together federal, state, and local partners and funders together for the project Habitat for Hard Places, designed to create physical structures along the Cuyahoga shipping channel bulkheads to that provide oxygen, food, and shelter to larval and juvenile fish. Project partners include Cuyahoga County Planning Commission, the City of Cleveland, the RAP, Cleveland Metroparks, and finding came from Sustain Our Great Lakes, ArcelorMittal, and the Great Lakes Restoration Initiative. According to a County planner, “This project became possible by the coming together and sharing of ideas by various agencies and organizations that had their own projects going on.”
Bridges Across Policy Arenas. The RAP process was perhaps the most significant step in bringing the stakeholders together to think about the resource as a whole ecosystem and not as parts designated based on the historic use of the river. Issues of jurisdiction, authority, and service area traditionally hindered agencies working together, even on watershed issues that cross boundaries of political jurisdictions. The traditional regulatory model for policy implementation under the Clean Water Act meant that the regulatory agencies created and administered regulations, designed projects, and allocated resources according to the mandates (Innes & Booher, 2010). This also meant that the agencies were restricted within their mandates, which sometimes were conflicting with those of other agencies. The issues that were being discussed as part of the RAP process went beyond just the restoration of water quality and ecosystem services in the AOC. The RAP with representation from state and federal agencies, local public jurisdictions, industry and private commercial interests, and community interest groups provided a governance approach that offered the opportunity for these actors to discover the interdependence of their interests and the usefulness of joint problem solving.

Agencies across policy arenas and geographic scales were part of the RAP planning process. USEPA, US Army Corps of Engineers, and National Park Service were from the federal level; the EPA and Department of Natural Resources (Ohio DNR), and Board of Health were from the state level; and NOACA, NEORSD, Akron Public Utilities Management, Cleveland Department of Public Utilities, Cuyahoga County Sanitary Engineering Office, and others were from the regional and local level. There was also participation from the county level department of environmental services and boards of health.
Networked Governance in the Watershed

The collaborative work in the Cuyahoga River watershed is an amalgam of ecological restoration, cultural preservation, and economic revitalization. A key goal of planning, restoration, revitalization, and management activities has been to transform the image of the river and its valley from industrial sewer to a vital regional asset in terms of health, economic development, and ecological and aesthetic resources. Key local agencies through the RAP effort, programs from the National park, the 319 watershed planning and project grants, and so forth mobilized partners as a network and built organizational capacity to work on collaborative initiatives. Recognizing the connections between ecological, economic, and social issues and working together to transform the Cuyahoga River watershed and the valley through diverse individual and organizational networks has been the critical focus of the governance efforts. This was a fundamental change from the disparate scales at which the partnerships had traditionally worked in the watershed and reflected a shift in the overall goals of governance of the watershed. In the words of a planner at the Cuyahoga County Planning Commission

What was learned was that an organization – or organizations – charged with making the Cuyahoga Valley into an economic force, environmental treasure and unifying element for the region would need to be able to operate in a complex world, involving a myriad of players public and private. It would need to be agile, adaptive, permeable, inventive and resourceful – able to work in deep collaboration with a wide base of enterprises to co-create results with sustainable benefit to the Valley, each enterprise and the region (Personal Communication, 2015).
Networks for Planning within the Watershed. The RAP process is a prime example of institutionally driven participatory planning to achieve cooperative and coordinated planning action within a watershed (Hartig and Law 1994). The director of OEPA’s Division of Surface Water appoints the official steering committee for the Cuyahoga RAP, with intention to bring together a wide range of stakeholders (community groups, individuals, businesses, government agencies and local officials) in the protection and restoration process (CRCPO, 2014a). As the CRCPO developed the RAP, they realized that the Cuyahoga River watershed was too large to encourage meaningful participation by stakeholders. Therefore much of the RAP work has been carried out at the sub-watershed scale, working with the tributary watersheds. Watershed Actions Plans (WAPs) and Balanced Growth Plans (BGPs) have also been developed for several tributaries to the Cuyahoga River. The WAPs are developed by local watershed groups to serve as a guide for mapping the strategy for watershed protection and improvement. WAPs fall under the purview of WQA, and once established, can be used to leverage funds for projects. One of the key goals that Ohio EPA had in mind while creating the nonpoint source program for Ohio was for the WAPs to not only provide a framework for addressing all water-resource related issues, but also to provide an opportunity for local participation and empowerment. Since the regulatory authority of government agencies is limited to the provisions specified under legislation, there are many areas that fall under the jurisdiction of local governments. Therefore, WAP process is led by a local group, typically a watershed group or partnership, and includes individual citizens, local municipal governments, state and federal resource agencies,
private organizations, and many others. The idea is to ensure a broad base of representation (Ohio EPA, 1997).

The Balanced Growth Program is voluntary in nature; therefore, instead of regulatory mandates, the BGP relies on incentives to local governments (Bollmer, 2009). To gain access to funding for plan making, implementation, and other incentives through the state program, the BG watershed plan partnerships must include at least 75% of the local government jurisdictions in the watershed, cover at least 75% of the area in the watershed, and include at least 75% of the watershed population (Kellogg 2009). These partnerships may already exist in the watershed or are formed for developing the Balanced Growth Plan. The local governments have most of the responsibility to implement the plans and hence their participation is central to the process. The final plan needs to be approved by resolution by each of the local governments in the watershed (Bollmer, 2009). Implementation of WAPs and BGPs has leveraged Section 319 funds and Ohio EPA’s Water Resources Restoration Sponsor Program to fund various restoration projects in the Cuyahoga River.

In order to understand the plan making and implementation process within the watershed, I reviewed five balanced growth plans for the tributary watersheds, four watershed action plans for the tributary watersheds (different watersheds than the BGP plans), and the Remedial Action Plan for the entire Cuyahoga River watershed. The five tributary watersheds of the Cuyahoga River for which BGPs have been developed are Big Creek Watershed, Brandywine Creek, Chippewa Creek, Little Cuyahoga, and Furnace Run. The watersheds that have undertaken a watershed action planning process are Middle Cuyahoga, Mill Creek watershed, Tinkers Creek, and West Creek.
Figure 5.13: Formal watershed planning network

Figure 5.13 shows the formal networks of actors involved in the plan development and implementation processes. The *formal* part of the process of plan development and implementation differs between the BGPs and the WAPs. For the BGPs, the Cuyahoga River Community Planning organization (CRCPO), cities, watershed planning partnerships (WPPs), and the county board of health are the key actors involved. This is not surprising as these are the actors that are part of the formal plan making process, and also play a key role in implementation of the plan. For the WAPs, the actors that are formally engaged with the plan making process expand. Depending on the geography of the tributary watershed, the county level health departments, planning commissions, soil and water conservation districts, and park districts are also involved. For at least one of the WAPs (Middle Cuyahoga) and the RAP, the regional level council of governments (NEFCO) and a county level department of environmental services
governments (SCDES) are also involved. The other actors participating in the WAP plan process are cities, villages, watershed planning partnerships, OEPA, the regional sewer district (NEORSD), and an academic institution (Ohio University). The RAP steering committee on the other hand includes actors from all three levels of government (federal, state, and local), for-profit and nonprofit organizations, park districts, and representation from city.

**Figure 5.14: Informal watershed planning network**

In the *informal* network the interconnections between all the key actors increase, with an increase in the number of actors participating across more than one policy arena (Figure 5.14). The most noticeable change is the addition and extent of involvement of private or for-profit actors. The majority of these for-profit actors are environmental (restoration, design, etc.) consultants who play an important role in bringing technical knowledge to watershed planning efforts. Industrial actors also become part of the
network. The role of OEPA also expands in the informal network, which may seem contrary to the purpose of a state level agency, which has formal authority in the RAP process. However, the role that OEPA plays in the informal network is not that of a mandating agency or funder, but as a scientific resource, mainly due to the personal connections created by the OEPA staff with the local watershed stakeholders.

As the literature notes, the reason actors or network members form relatively non-binding, non-institutional, relatively loose networks are for the purpose of knowledge and information sharing (Bodin & Crona, 2009; Folke et al., 2005; Provan & Kenis, 2008). It is clear from the inclusion of the actors in the networks on the Cuyahoga that mobilizing resources such as knowledge and expertise are important. Local actors are added to the network based on their knowledge, expertise, interest in the resource issue, and contacts with other key actors. This expansion of the governance network process begins with intentionality embodied in the formal inter-organizational relationships mandated by law, but the entire governance network emerges through the various planning and implementation activities. The informal network is a knowledge sharing mechanism, an example of an adaptive system without one central authority. The various plans and the documents that were reviewed mentioned that several actors contributed to the making of the plans and designing the programs by providing technical guidance/assistance and support.

**Summary and Implications**

Governance actors in the Cuyahoga River have faced multiple challenges in managing point and nonpoint source issues including the complex nature of the problem, the nature and extent of regulatory mandates, several regional and local level government
agencies with authority over implementation and regulatory compliance, and land-use zoning authority belonging to the local jurisdictions within the watershed. In this chapter I presented my analysis on characterization and analysis of urban SES, in this case an urban watershed answering the first of my research questions: What are the various influences and dynamics that shape a watershed system? How can a watershed SES be characterized and understood so that the influence of governance on system attributes and the attributes critical for building adaptive capacity are identified? Historically, resilience scholars have focused on empirically analyzing non-urban areas (e.g. production forests, shallow lakes, small-scale agriculture). Through the results presented in this chapter, I bring resilience scholarship to a human-dominated ecosystem, explicitly focusing on governance and management elements and their effect on ecosystem outcomes.

To address the broad question of resilience of what, to what, I characterize the focal system, that is, the urban watershed and the specific time period and geography under study. Defining the geographical and temporal boundaries of the focal system is a key step in defining and assessing the system. Based on the interpretive nature of this study, both of these factors are emergent, evolving from the narratives of the interviews of the governance actors and through observations. This is a critical aspect of an interpretive study that focuses on local knowledge and experiences of governance actors, upon which the resilience assessment is based. This is a grounds-up way of conducting a resilience assessment exercise and the outcomes of this process presents a deeper understanding of adaptive capacity. I would like to note that the results of this chapter alone don’t suffice for the presentation of a discussion on adaptive governance. In
Chapter Eight, I summarize the results from Chapters Five, Six, and Seven and present a discussion on adaptive governance.

By using an ecosystem assessment framework to describe and characterize the focal system, I sought to achieve two goals. First, adding to the area of research that scholars pointed out as ecosystem services having the potential to improve urban ecosystems and socioeconomics of cities (Green et al., 2016). I did this by evaluating the provisioning, regulating, supporting, and cultural services provided by the Cuyahoga River watershed. By using the ecosystem services framework as the first step in defining the focal system, I present a new approach to connect ecosystem services with resilience assessment for urban SESs. This has the benefit of defining and understanding the connections of urban ecosystem services to socioeconomics of cities via social factors and governance and management influences. Second, using an ecosystem framework to describe the evolution of the Cuyahoga River watershed through the most distinct epochs, I combine historical analysis that is useful to study the trends and patterns that an SES has undergone with the key ecosystem services associated with each of these epochs. This horizon of understanding has the potential to guide future planning and governance strategies and management interventions.

Arraying the disturbances that an urban SES has undergone in the past and outlining the expected future changes and uncertainties makes it easier for watershed managers to better adept themselves in anticipatorily planning for governance and management actions. I discussed the slow moving variables that changed the Cuyahoga River watershed overtime and the disturbances that precipitated swifter changes. For example, slow moving changes such as land use zoning and fragmentation in land use
across municipalities is a critical factor to consider while thinking of long term governance of the watershed. I present the links between accounting for such changes in the management actions that are being planned by various governance actors in Chapter Six. Future projections of climate and the uncertainties regarding the feedback from the current land use planning and development with the various climatic events is a pivotal area of focus for future regional and local policies and organizational practice for policy implementation.

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<th>Cuyahoga Watershed – Characterization and Analysis of SES</th>
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<td><strong>Focal System - Resilence of what, to what</strong></td>
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**Table 5.2: Characterization and analysis of Cuyahoga River watershed SES**

I then discuss the biophysical and social drivers and governance and management influences in the Cuyahoga River watershed. Biophysical drivers in the Cuyahoga River watershed include a combination of natural, policy, and physical infrastructure driven
factors. Chief among these are the AOC program driven BUIs, climate and physical environment, land use and urban hydrology, land use patterns, combined sewer overflows due to ageing and outdated infrastructure, and type of urban soils (see Table 5.2). I describe the current effects of these biophysical drivers to various aspects of watershed management. Key social drivers discussed in this chapter are geo-political complexity and watershed based land use planning, the river as a means of economic production, demand for recreational access and opportunities, stream and watershed stewardship activities by communities, community and public education (awareness-building), and trust among actors and presence of strong community and social networks. Arraying the social drivers are important for evaluating the influence that various governance influences will have on these drivers, in thinking about adaptive governance in the watershed. Table 5.2 provides a summary of the discussion on characterization and analysis of the Cuyahoga River watershed SES presented in this chapter.

Lastly, I present a discussion on the governance and management influences at play in the Cuyahoga River. Understanding the institutional structure and influences and overlapping areas of management is key to understand collaborations and interdependence of institutional and implementation interests. Since the Cuyahoga River is governed by a constellation of policies, and the governance is fragmented in terms of governmental responsibilities, both vertically (e.g. local, regional, state, national) and horizontally (e.g. among different agencies of government such as natural resources, water, wastewater, and such) mapping the watershed management arenas provides a structure to understanding the watershed management activities in the watershed. Through an example of watershed networks for planning activities in the Cuyahoga
River, I demonstrate networked governance in the watershed. Comparison of the formal and the informal networks in watershed planning depicts that actors span organizational and disciplinary boundaries to draw from other organizations expertise and knowledge regarding aspects of watershed planning and management. Identifying these key connections and type of stakeholders provides insights into sources and channels of knowledge and information in the watershed.

The manner in which I applied social network mapping in this chapter can be useful in characterizing network actors and type of relationships and identifying gaps in knowledge and/or collaboration as a diagnostic tool (Clark, 2006). An advantage of using mixed methods network mapping is that, for watershed practitioners and managers (could be from governmental or nonprofit communities) conducting surveys and interviews can sometimes be time consuming and cost prohibitive. Using secondary documents as a basis for network analysis/mapping and/or combining this method with a traditional survey method for network analysis is useful to produce a variety of network results. Network maps can be used and presented to agencies and funding organizations for securing funding for projects. For example, a social network map of watershed projects undertaken by the Ohio EPA Northeast District Office with community members would depict the extent of community connections used for various projects. Such a tool is helpful for funding agencies as it shows that district offices of state government agencies are weaving and maintaining local relationships, and would ensure that the grant funding for projects are justified, as better community involvements ensures completion of projects and fulfillment of targeted environmental outcomes. I used network mapping to depict planning networks in the Cuyahoga River watershed. Such as exercise could also
be used for mapping implementation projects that depicts institutional trends and identifies similar and/or initiatives so that duplication of efforts in watershed management can be minimized and or consolidation of efforts can be planned.

Analysis of the Cuyahoga River SES presented in this chapter reveals several characteristics of adaptive governance and processes that build capacity for such governance. Connectivity between individuals, organizations, agencies, and institutions at multiple levels of operation is key for building capacity for adaptive governance. Based on the evidence presented in this chapter, actors have created connections across multiple horizontal and vertical levels of operation, across agencies and organizations, and with community members. For example, the RAP has provided a forum for the exchange of ideas and facilitated collaborative projects. I describe the networked governance in the watershed via formal and informal watershed planning networks. Evaluating the informal network reveals the connections that actors make beyond the institutional connections and partnerships mandated for conducting watershed based planning. The presence of several subwatershed based partnership organizations have worked on building community networks and relationships. The Balanced Growth Plan process has connected communities and municipalities with agencies and watershed organizations. The presence of these and many more such initiatives and programs and the constant focus on building more collaborative forums activities (discussed in Chapter Six) shows that governance actors place high value on collaborative activities that facilitate trust building.

The design of community and public education and outreach programs by the watershed groups, the Cuyahoga RAP, and government agencies demonstrates the
creation of a learning environment. Community education programs are not just limited to outreach of information, but training of community based watershed volunteers that are actively engaged in project implementation and monitoring. This involvement of community members in watershed management creates capacity within watershed communities.

Other aspects of adaptive capacity within the current governance processes are visible in the Cuyahoga River watershed, which are described in the next chapters. I also describe intentional, deliberate actions and interventions by governance actors to actively transform watershed governance.
Successful implementation is often accidental while failed implementation is the result of design – Ann Chih Lin (1996)

Water Pollution Control Policies and Implementation

O’Toole (2000) argued that “[p]olicy implementation is what develops between the establishment of an apparent intention on the part of the government to do something, or to stop doing something, and the ultimate impact on the world of action” (p. 266). Traditional policy scholars have contended that the clearer the policy mandate and directive, the easier it is for implementers to follow directions and implement policy. However in this framing, the expectations of the clientele that are affected by policy are not taken into account. Operationalization of policy also includes the involvement of various actors/players at various governmental levels and across departments/agencies at the same level of implementation (deLeon & deLeon, 2002; Yanow, 1996). The actors at the local level most closely associated with the policy implementation are also the ones most attuned with the complexities of local management, which is intricately linked with social factors, local politics, environmental conditions, presence of institutions, community dynamics, and so forth. Since laws and regulations (the policy itself) don’t
fully dictate administration and implementation action, policies require interpretation for implementation (deLeon & deLeon, 2002). Further, policies have been understood “as the whole of the activities of and relations among self-conscious, purposeful, and independent actors” (Morçöl, 2012, p.10). Local actors have different roadmaps through which they carry out their interpretations that are largely based on the realities of local governance.

The complexities of public policy are clearly evident in the case of water pollution control in the United States. This is owing to wide variety of land use patterns across regions, land use zoning authorities, and different environmental issues in rural and urban watersheds due to their varying biological systems. Traditional variables that play a key role in policy implementation such as human capital (e.g. income, education), social capital (e.g. relationships, trust, networks), and the financial, technical, and human resources available also increase the complexity of water policy implementation (Hardy & Koontz, 2010). The current form of water pollution control policies that we see is the legacy of the environmental era (1970 onwards). In order to understand what implementers do within the current governance paradigm (creating conditions for ordered rules and collective actions based on coordination between societal actors), the context created by the environmental era is important.

Compared with the previous water pollution control and management eras (pre 1970s) the environmental era was characterized by: 1) improving the technical and financial capabilities of state and local agencies using federal grants, and at the same time, subjecting such agencies to stringent federal oversight that limited administrative discretion; 2) granting more voice to environmental groups and citizen access to
bureaucratic decision making via provision of procedural access early in the decision process and ability to challenge agency decision in courts; 3) creation of a federal pollution control agency with the ability to integrate pollution control program with other agency responsibilities; 4) tightly constrained discretion of federal and state agency officials via detailed substantive and procedural rules; and finally 5) ramping up priority of environmental values in existing statutes and passing legislations to fill in the gaps in pollution control and mitigation. The 1972 CWA established a system based on the above reforms. There was explicit priority for environmental values in existing statutes that enhanced state capacity through a variety of federal grants. Based on the reforms, the CWA also included several factors such as federalization of authority, constraints on agency discretion, lack of collaborative decision-making process, litigation as a major strategy, lack of a watershed focus led to the evolution of the next stage in the watershed management – the experimental or the collaborative era (Sabatier et al., 2005).

The 1972 CWA however, remains “the principal body of water pollution law currently in effect,” and is implemented chiefly based on a federal permit system to regulate point sources of discharge and by delegating the role of administering the program and setting water quality standards and effluent limitations to surface waters to the states. Nonpoint, diffuse sources of pollutions, however are exempt from the CWA permit program (Shwab, 2010, p. 467). The 1987 CWA amendments made the focus on nonpoint source pollution a national goal and included nonpoint sources into its regulatory framework via sections 208 and 319 (Sabatier et al., 2005; Shwab, 2010). The amendments are the only major piece of legislation focusing on the CWA that has been enacted since 1972, and based on this legislation the current water pollution control era is
characterized by moderate legislative activity (Hoornbeek, 2011). Administrative experimentation rather than strong congressional leadership has sparked several experiments in water management. Congressional direction for water pollution control has been observed as a “continuing process of largely predictable policy outputs, followed by less certain policy impacts, followed by highly uncertain policy outcomes” (Hoornbeek, 2011, p. 131). In anticipation of changing impacts and outcomes, Congress changes direction, producing a new set of policy outputs, which has implications for the federal system, “with the certainty of their implementation decreasing as implementation moves from the center to the periphery” (Hoornbeek, 2011, p. 131). Therefore the important question is how policies are implemented across states and the effect of policy outputs in environmental impacts and outcomes.

Congress also has established different policy structures for point and nonpoint source water pollution control. The USEPA’s role and program elements also differ for these two water pollution control activities as do state roles. USEPA’s authority for point source discharges regulation is directive, focused, and deep. For nonpoint source water pollution control, however, USEPA’s program elements are broad and general, rather than specific and comprehensive. USEPA’s authority is supportive, broad, and shallow. The support provided by USEPA is mainly in the form of guidance and technical assistance documents (Hoornbeek, 2011). The lack of clarity and direction from the federal level along with the primary policy making role of the states (with their administrative role being secondary) when combined with insufficient resources and ambiguous nature of nonpoint source pollution and local politics, leaves much to the decisions and actions of public administrators and street level bureaucrats.
There also has been a widespread commitment to and interest in collaborative, place-based management among watershed managers. Interviews and observations revealed that watershed actors increasingly make decisions by consensus, through a more democratic process, keeping in mind interrelations between environmental, social, and economic goals. Some of the key agencies in the watershed, instead of acting as ultimate decision-makers, are involved in watershed management as facilitators and technical advisors. Given this background, I explore the interpretations of actors involved in this collaborative process of policy implementation and governance.

**Research Questions and Analysis Method**

Given this background, the research questions that this chapter addresses are:

*How do actors/agents make sense of policy implementation and the realities of everyday governance? “How do the policies mean” and how do the meanings shift in the process of implementation? How does that in turn affect the implementation process itself, and the meaning of the resource overall over time?*

This chapter specifically presents the meanings that governance actors make and derive in the process of policy implementation and being involved in the everyday processes of governance. As previously described, policies are enacted with a specific meaning, but when moving through subsequent layers of implementation and enforcement, these policies assume various meanings, mainly based on the beliefs, practices, and values of actors, and on the context of policy implementation. The results presented here are derived from the informal and formal interviews and field observations. A combination of frameworks is used to arrive at meanings that emerge across various communities of practice involved in watershed management. The steps of
the overall analysis are informed by Yanow’s (2000) interpretive policy analysis framework, and an interpretive phenomenological analysis technique by Smith, Flowers, and Larkin (2009) is used to analyze the interview data.

**Analysis Method**

As discussed previously, the interpretive nature of this study embodies that the process of analysis is not distinctive from the process of data collection, and I started the process of analysis during interviewing and observing. The policy meanings that governance actors (e.g. watershed managers, government agency staff, local watershed group members, elected leaders, community stakeholders and leaders) in the Cuyahoga River watershed acquire, which influences their management actions are shaped by their contexts. Instead of a traditional manner of understanding actors through discipline or practice based communities (e.g. planners, ecologists, industrial actors, engineers), actors in watershed management here are understood as representing “communities of meaning,” that is, a set of values, beliefs, and feelings that bind people together. Overtime, due to reinforcement provided by cognitive, linguistic, and cultural practices, these communities of meaning become “interpretive communities,” sharing common meaning, thought, practice, and action (Yanow, 2000).

Drawing from Yanow (2000), the following steps describe my analysis procedure:

**Step 1** – identifying the artifacts (language, objects, acts) that are the significant carriers of meaning for the policy issues, as perceived by the policy-relevant actors/publics. In this case, the policy was the 1987 WQA (amendments to the CWA) and the Remedial Action Plan Program for the Cuyahoga River Area of Concern (AOC). “What is the Cuyahoga River basin/watershed/valley” appeared to be the artifact that was
interpreted differently by different actors. I identified how different communities are framing and using different or similar language for the resource, understanding different things about the same subject, and how these conceptualizations would lead to various programs and actions (within the broad purview of the overall policy implementation).

*Step 2* – identifying communities of meanings/speech/interpretation relevant to the policy issue under investigation. Identification of different interpretive communities and their discourses provides insights into the actions. As I was conducting both the informal and formal interviews and carrying out observations in the field, I started putting together a picture of various interpretive communities and the language, understanding, and interpretation along which they were orienting themselves.

*Step 3* – identifying the specific discourses and the meanings that are being communicated through specific artifacts such as speech, actions, interventions.

*Step 4* – showing the implications of different meanings/interpretations for policy related action, and how different actions reflect different ways of seeing. That is, mapping the architecture of different interpretations in terms of similarities and differences, with respect to the resource issue and noting the materialization of these interpretations and the implications for action.

The interviews were conducted in a conversational format, where the participants shared their stories about their work on watershed management, the history of the evolution of watershed health for the Cuyahoga River, their involvement and work with watershed communities, and practicing watershed management in an urbanized watershed subdivided into several municipalities/communities with municipal home rule powers. Focusing on the narratives and the language of the actors revealed how actors
make sense of their practice. The observations and informal interviews provided a window into the metaphors used by the actors to describe their work. Focusing on various sense-making elements such as the metaphors used by the actors in their narratives, categories and markings, and settings of the places (where the observations were carried out), I gained further insights into the governance world of actors (Yanow, 2000).

I analyzed notes from observations and interview transcripts, first by reading and rereading them, which increased my familiarity with the narratives and the spatial and organizational environment until I began to see patterns and draw connections. To arrive at the results, I drew a conceptual topic outline, which I continuously revised as the analysis proceeded. I then transferred quotes, observational details, and themes emergent from interviews, and inferences to the conceptual outline (Yanow, 2000). The transcripts were not coded line-by-line prior to summarizing the emergent themes (Charmaz, 2006). Instead, I used a focused or selective coding process to identify the underlying themes in the interview narratives. In doing so, I applied multiple codes to the same text/narrative, which is referred to as parallel coding (Perey & Benn, 2015). This process was carried out throughout the data collection and analysis process, and some new themes were identified even during the process of writing this chapter.

Interviewed actors were staff at the regional sewer district, current and retired planners at the Cuyahoga County Planning Commission, National Park Service staff, directors of local watershed groups and land conservancies, directors of community based watershed advocacy organizations, staff at Cuyahoga County Port Authority, staff at Cuyahoga RAP non profit and RAP advisory committee, US EPA Cleveland field office
staff, elected officials in various municipal jurisdictions, staff at regional planning agencies (NOACA and NEFCO), and staff at the Ohio EPA Northeast District office.

The conversation during the interviews started broadly; participants began by talking about the history of their relationship with the Cuyahoga River. The various themes that I present here are emergent, based on responses across several interviews.

**Results**

**Relation to the River and Perceptions About it**

Connecting with the resource, experiencing it firsthand, reflecting about what was and has changed over the years are ideas that frame participant narratives. Most of the actors, irrespective of professional background or areas of practice, had a firsthand experience of relating to the Cuyahoga River through personal and recreational experiences – “It’s the element that ties our whole region together I think, and the history of where it was and where it has come is really sort of important to Cleveland and who we are” (Personal Communication, 2015). Through their narratives, it appeared that most of the actors continually related their perceptions about the river to their work and practice and vice versa so that one informs and enriches the other.

**Recreational connection.** The earliest river recreational enthusiasts started paddling the river in the 1970s. The upper parts of the watershed, as discussed in Chapter 5, were preserved and well-suited for recreational activities. The recreational enthusiasts didn’t restrict themselves to the upper watershed, but rowed in the middle Cuyahoga section and further below to the Lower Cuyahoga sections as well. The landscape changed dramatically as they made this geographic transition. Being so close to the water and being on the river provided them with a unique perspective. Experiencing the river
through recreational paddling indirectly shaped concerns and understanding about water quality. A long-term watershed steward and recreational enthusiast described her experience as:

There was an attitude about rivers at that time that made people...it was very easy to mistreat the river because everybody else did. It was considered a place where nobody wanted to go. It was the place that carried floodwater away and wastewater. A lot of the river was not very attractive, either, except through Peninsula. From Ira Road to Hillside is very beautiful. The river is beautiful…but down here below the Little Cuyahoga, people very rarely paddled because it wasn't just combined sewer overflows. There were sanitary overflows. Big ones (Personal Communication, 2015).

While overtime the river has been cleaned up and the water quality has improved significantly, in the 1970s people perceived the river as a conduit for wastewater and stormwater.

Nowadays, the navigational channel provides a unique rowing environment (See Figure 6.1). This has come about not just through the improvement in water quality but also the involvement of agencies such as the Cleveland Metroparks in its efforts to encourage and facilitate rowing by creating related infrastructure in that section of the river. The uniqueness of rowing environment in the navigational channel, where the river is very narrow and the commercial freighters come right up the river, draws recreational paddlers from all over Ohio and beyond. But experiencing the river firsthand at such close quarters also points out the fact that there is further room for improvement. Scientific testing reveals that the water quality has improved, through much is still to be
achieved in terms of aesthetics due to the existence of debris resulting from urban trash and runoff.

Figure 6.1: Rowing in the navigational channel part of the river – a “unique” rowing environment. In the background of the rowers bulkheads and industries are visible (Author, July 10, 2015)

**Personal experiences shaping practice.** Actors used their professional background and training to develop a unique view of the resource, which in turn shaped their practices and actions within the governance processes. For example, a Cuyahoga County planning executive used her training in environmental biology and working for a steel company in the Cuyahoga River watershed to think about the river, and not just in terms of water quality. Interactions with the advocates of the Towpath Trail in the Lower Cuyahoga River watershed in the 1980s revealed to her the connections between water quality, recreation, and sense of place, which shaped her practice as a county planner much later. An urban planner and journalist used his background in architectural history to understand the history of the Cuyahoga Valley and cities growing around water, to shape his work on refreshing people’s memories about the resource.
I put that together with my understanding of the urban history of Cleveland as a city that grows up around the river and the historic… We acquired the Emerald Necklace but this area [Cuyahoga Valley] was declared off limits for quality public space. And this is the area into which you have immigrant populations coalescing to work in our factories and steel mills and oil refineries in the late 19th and early 20th centuries creating a hellish environment that we’re still cleaning up today… So I thought that by bringing people down into the valley, by showing them the river, by seeing the industrial landscape we would have a greater appreciation for the history, we would have an impetus for urban revitalization and recruitment of the middle class back to the city reversing the exodus out in the middle 20th century and it would just make life better in the city (Personal Communication, 2015).

The river had been inaccessible to the general public for decades as industrial and private land along the river and road crossings precluded access. The areas on the edges of the valley, the slopes, and all the places of scenic viewpoints were blocked by private development. There was no opportunity for the public to have contact with the river, as there were no public spaces along the river for such contact. A combination of factors brought dramatically increased public awareness of the river and stimulated larger policy interest. The role of the National Park and a local grassroots-level nonprofit group effort to build the Towpath Trail, the RAP process, and residential interest group and recreational users of the river, among others are some of these factors. A common perception is that cleaning up of the water was the main reason for resurgence of the Cuyahoga River watershed. While improvement in water quality of the Cuyahoga River
played a significant role, the actors and their organizational goals listed above played a key role, certainty as important as clean water, to direct attention towards to the river as a focal point for the northeast Ohio region.

**Placemaking: Creating a Sense of Place and a Local Identity**

*Reclaiming the valley.* A resounding theme that emerged across actors from various communities of practice uniting them as an interpretive community was reclaiming the Cuyahoga Valley and restoring among people the lost connection to the valley and the river. The residents of the Cuyahoga Valley had a “disconnect” with the river for most part of the late nineteenth and twentieth centuries. A primary reason to which many interviewees ascribed this disconnect was that the Cuyahoga River was never a source of drinking water for the communities that lived along the river. Since the time of the earliest settlers, the river has always been used for trade and transportation, and later for industrial processes, during which it turned into a conduit for carrying industrial waste. The ground water resources in the narrower part of the valley are very poor and there have been very few good producing water wells. People had historically used ponds and had water trucked into the settlements. More recently, the intake point for water supply in Cleveland being five miles out into Lake Erie has supplied safe drinking water, and therefore the residents in the valley didn’t care much about the water quality in the Cuyahoga River or pay much attention to preserving it. Any sense of belongingness to the river has been difficult to cultivate, historically. Further downstream, in the lower part of the watershed, the river has been mainly used as a navigational channel for commercial and industrial purposes. From an economic development viewpoint, upstream of the shipping channel, the river didn’t really perform any economic functions
and “was left alone and kind of somewhat forgotten” (Personal Communication, 2015). During the height of the industrial era in Cleveland, communities along the river were settled to get easy access to the factories along the river, but the river itself was used almost exclusively for industrial purposes, tucked in the valley, and out of sight (Stradling & Stradling, 2015). A long-time watershed steward described the community attitude towards the Cuyahoga River as:

The Cuyahoga was just so degraded that in a sense people just gave up on it. It was kind of written off as an industrial wasteland and it was like, why even clean this thing up? People couldn't even envision the value (Personal Communication, 2015).

This is one of the chief reasons, actors noted, that municipalities in the valley within whose boundaries the river flowed were totally uninvolved in watershed management. This was largely the case until relatively recently, well into the 1980s and early 1990s. Municipalities were involved with the Cuyahoga Valley National Park but not with the Cuyahoga River, which flows right through the heart of the Park. A retired National Park superintendent observed, “the municipalities, if you think about it, are sort of strangely silent about the river. They didn’t in any sense own the river” (Personal Communication, 2015). The community had fundamentally turned its back on the river. There was attention focused on the river from the government agencies such as the Ohio EPA and the USEPA, but by and large, public interest was missing. Additionally, the communities in the Cuyahoga valley, post deindustrialization, were battling through poverty, struggling school systems, high percentage of unemployment. Their relationship with the natural environment was never a priority, at least not through grassroots level
efforts. This was a key factor related to policy actions to consider – building public interest around the river and the valley – and the leadership at several Cleveland area institutions did exactly that. A local city government official and a proactive leader in transformation of the perceptions of the lower Cuyahoga River watershed expressed:

You know I think the best cities and the best places in the best cities are very comfortable with their origin stories. And it is really a little bit unsettling to think that for a very long time the place from which this city grew, for most people, was not only a place which they had never visited, or participated in, or been on, or in, or through (Personal Communication, 2015).

**Making communities and geographies.** Two key events started shaping change in the Cuyahoga valley – first, a change in the leadership of the National Park that led to an effort to consolidate the patchwork of pieces and parcels of land that were owned by the park in the valley; and second, building of support and funding for the Towpath Trail along the old Ohio and Erie Canal (O&E canal). A National Park superintendent gave an example of his efforts to evoke public interest about the river:

I made the statement to the Akron Beacon Journal that the Cuyahoga River is a river that had no friends, and I did that purposely. It was intended to be a provocative statement. It had exactly the right effect, because there were people that read that article, where the Superintendent of the National Park was describing the Cuyahoga as a river that had no friends, and the people stepped up and said that the river does have friends (Personal Communication, 2015).

Actors and proponents of the Towpath Trail saw it as a way to address the “geographic amnesia” and to focus attention to the natural armature – the Cuyahoga
River and Valley – around which the city of Cleveland had developed. Around this time, in the late 1980s, trail advocates started building a case for the Towpath Trail with the National Park staff and with the Cuyahoga County Planning Commission (CPC). The idea of the towpath was to serve as a “connector” – between the National Park in the Cuyahoga Valley to downtown Cleveland, and between the current public consciousness (or lack thereof) with the history of the valley. Because of the Towpath Trail, people went from having no access to very intimate access to the river. People couldn’t swim or bathe in the river still, but they could view it from the Towpath Trail. The CPC being a regional agency, as opposed to the planning departments of individual municipalities within the Cuyahoga River watershed, was an obvious choice for an agency to work on the revitalization of the valley. The CPC undertook a study and published a report, the North Cuyahoga Valley Study that essentially started framing the valley as a single entity. This study also became the framework for the studies that would be done later on the Cuyahoga Valley. A retired CPC deputy director describes this as:

Well, I said it really makes a lot of sense because right now [in the late 1980s] there is really no destination. It was National Recreation Area then, it was heavily visited, but mostly people driving through it. There was no place to actually go to; it was through not to. And it began to frame the Valley as a single entity, instead of pieces of people of communities. The valley was always some place to cross, so we tried to make it a destination. But it was basically to create a much bigger destination than just a National Park (Personal Communication, 2015).
Figure 6.2: A mural in the Cuyahoga River Flats depicting the vitality of community life in the neighborhoods surrounding the area (Author, July 10, 2015)

Figure 6.3: The “messy vitality” of the Cuyahoga River. The photograph on the left depicts a downtown section of the river. Visible in the photo are two more than a century old bridges – a draw bridge and a swing bridge, a Port Authority debris harvester, and new luxury condominiums behind the red swing bridge. The photograph on the right depicts the opposite bank of the river with 150-year-old buildings that are commercial and warehouse enterprises (Author, July 10, 2015)

Leveraging the “messy vitality” of the river. Over the past decade or so the Cleveland Metroparks played a key role in providing access to the river and increasing recreational opportunities. In the late 1990s, paddling experienced a recreational surge. Dam removals in the middle section of the river not only improved water quality, but also extended uninterrupted canoeing opportunities in a longer stretch of the river. Planners,
watershed groups, and national park staff leveraged the idea that – “the Cuyahoga River was the heart of northeast Ohio and that its health reflected exactly the health and economy of the region” – to shift the narrative of the river and to take actions to bring this idea into fruition through organizational and community efforts (Personal Communication, 2015).

In the Flats section, the area along the navigational channel part of the river in downtown Cleveland, local leadership and community efforts in recent times have facilitated major revitalization efforts. A key local government official involved in these efforts attributed the difference between the recent revitalization efforts compared with the previous history of development in the Flats to a fundamental shift in understanding – that a place should be appreciated for what it is; the “messy vitality” and “chaos” of the Flats shouldn’t be controlled, rather should be appreciated, and revitalizations efforts geared around it (see Figures 6.2 and 6.3). A retired County planner described the changes that summarize the actions of this “placemaking” activity in the Cuyahoga Valley as:

You know all these things that we talked about are coming together in a much more sustainable way. The improvement of the river as a destination, metropark commitment to Rivergate and Wendy Park, and Scranton Flats are public space that we never had before. There was no access to the river whatsoever and now there is. Now people can fish and row, they can’t swim, but they can do these other things. We are doing water taxis...So people can use trails, they can use water taxis, it is going to be awesome. Now you can get from one bank of the river to the other (Personal Communication, 2015).
In Chapter Five, I noted that the land use decisions of about 45 political jurisdictions in the Cuyahoga and its tributary watersheds affect the water quality of the lower segment of the river. Because Ohio is a Home Rule state, municipalities hold jurisdiction over land use zoning. Further, a fragmented governance structure due to the presence of several local and regional governmental agencies, drinking and wastewater agencies, health departments, and so forth makes watershed planning and management difficult because no single entity controls all policy aspects to comprehensively address the river’s problems.

**Governance, Policies, and Organizational Roles**

I described the governance and management influences in the Cuyahoga River watershed in Chapter Five, which includes three key areas of management: control and mitigation of pollution, protection and restoration, and economic redevelopment and revitalization. The actors that I interviewed work in one or more of these areas and on various projects and management activities that overlaps across multiple areas of management. In this chapter, I describe governance and the role of agencies as an emergent theme, evolving out of the interview narratives. The actors provide a unique perspective about their involvement in the governance processes.

The Cuyahoga River, undeniably, is regulated by a constellation of policies. The actors that I interviewed frame the narratives of their practice with their work in organizations and agencies that are involved with some aspect of policy implementation and/or development. It is, however, important to note that by *policies* local actors mean locally developed policies and organizational policies and programs, such as zoning ordinances, formation of council of governments, and development of organizational
mandates. When it comes to policies such as the CWA, actors use the terms legislations, regulations, and/or mandates. I describe here the policies that the actors most directly work with and included in their interview responses.

Actors have a pragmatic understanding of working with the “old governance model” and its limitations. Many actors that I interviewed work at government agencies that function according to the traditional bureaucratic model. Several interviewees describe traditional organizations as *parochial*, with too many silos and a complicated chain of command. Actors agreed government organizations are slow to modernize and update their structures and policies. A CPC planner commented on the institutional inertia towards collaboration as an example:

But the irony is that government rarely does intentional things together. And there is a good reason for that. There are issues and history of power, authority, jurisdiction, and/or abuse with government entities. These confines what a government can and cannot do. Business typically has more flexibility. Government has to work with a sense of constant accountability where they have to give you back services for your tax dollars. Government has to constantly prove that you are not wasting your resources (Personal Communication, 2015).

Actors agree that for effective watershed management, one needs to be nimble and flexible. Understanding the limitations of a traditional bureaucratic model, actors have been entrepreneurial in their practices by founding innovative ways of collaborating and designing and implementing programs, while adhering to the overall goals of their respective organizations.
The pioneering role of Ohio EPA. According to the Ohio EPA Northeast District Office (Ohio EPA-NEDO) at Twinsburg, the Cuyahoga River watershed is very disjointed in terms of traditional governance. The only common thread in terms of policy is water quality – Ohio EPA and the CWA form the common core of the governance in the Cuyahoga Basin. The main responsibility of Ohio EPA is writing the target compliance with the CWA and its enforcement. Further, agencies in the greater Cleveland region have an overlay of different authorities. Under the Ohio Revised Code, authorities regarding the handling of various aspects or sections of stormwater are designated to different agencies. There is absence of a holistic charter or legislation that addresses stormwater. For example, the Sewer District is the regional sewer authority, the Soil and Water Conservation District (SWCD) is the agency responsible for managing stormwater, some aspects of illicit discharges fall under the purview of Cuyahoga County Board of Health (CCBH), and Ohio EPA-NEDO is the big regulatory umbrella that monitors the work of these agencies related to clean water. This is an example of fragmented governance shaping the local level. Within the Ohio EPA, the Columbus office establishes and enforces standards for air, water, and waste and provides financial assistance to businesses and communities, and the district offices manage the agency’s programs at the local level.

Design and adoption of biological standards. The adoption and use of biological standards for evaluating and monitoring water quality by the Ohio EPA was an innovation that most actors thought played a key role in shaping a different approach to governance in the state of Ohio, especially in the Cuyahoga River. The Ohio EPA had developed biological standards in the 1970s, much before any other agency, and is
therefore considered a pioneer in this effort. The adoption of biological standards has been described as “groundbreaking” and the agency has been a leader in implementing these standards. In this sense the agency followed a different path than environmental agencies in other states. A nonprofit watershed group director emphasized the importance of this “different way of looking at watersheds” for holistic understanding of watersheds, their functioning, and health, because just focusing on physical and chemical indicators is not enough (Personal Communication, 2015). An Ohio EPA official summarized the biological indicators approach as:

From the very beginning OEPA has, from our water quality perspective, focused a lot on watersheds and assessments. So if you look at states that implemented biological standards, Ohio was the leader in doing that and still is…In chemistry anybody can take a test tube of water and analyze it but the real impact is what it is doing to the ecosystem, and that is where we have data from the 70s and early 80s when it was really bad and we can track that. So that is where you peel the way to the point source, the toxic impacts and now you are looking at nonpoint habitat driven impacts (Personal Communication, 2015).

Apart from the enforcement of NPDES permits to point source discharges, and providing technical assistance on projects, the Ohio EPA manages nonpoint source pollution via the agency’s Total Maximum Daily Load (TMDL) program, established under Section 303(d) of the Clean Water Act. TMDLs were originally proposed as a part of the CWA in 1972, but the US EPA did little to implement this section till the mid-1980s. It wasn’t until 1987, when the amendments to the CWA making nonpoint source
pollution control state and local responsibility, and introduction of the section 319 grants program was introduced, that states started designating impaired water sources and setting TMDL limits for the major pollutants. Specifically in Ohio, in 1995 the Ohio Environmental Council threatened to bring suit against Ohio EPA for not implementing TMDLs. Ohio EPA had collected biological data on the watersheds since the 19070s, and the agency found a way to tie that data with the chemical standards used in TMDL directions and developed a unique set of TMDL standards for the upper, middle, and lower sections of the Cuyahoga River watershed. The Ohio EPA-NEDO at Twinsburg is responsible for managing the agency’s work on the Cuyahoga River watershed.

The adoption and use of biological standards was a transformational practice in the 1970s, which is when the agency started using these standards. Ohio EPA took a different path than other states; the agency fulfilled its point source compliance related responsibilities, but was always cognizant of the broader water quality perspective. This thinking broadened the horizon of understanding of the agency, and staff started thinking about watershed more holistically, not just in terms of meeting water quality targets. This vision was a significant one that changed and shaped programs at the agency level:

Because we do the biology, we have the better ability to do things holistically, at a much better level because we are asking the streams to tell us how it is. We are not getting some water and arbitrarily saying whether it is good or bad… So we did the regulatory thing but we are always looking at what the impact is on water quality. So when you peel off that layer of when the discharges needed to be controlled, the sewage and the industrial stuff. And once those are off you are left with all the nonpoint issues the dams, the habitat which is a huge problem, storm
flows and how that does things in the system, so I think we got there understanding this maybe a little quicker than other states (Personal Communication, 2015).

Using biological standards such as exceptional warm water habitat and qualitative habitat evaluation index (QHEI), Ohio EPA-NEDO derived a better sense of water quality and the nature and source of nonpoint source pollution specific to subwatersheds and tributary watersheds of the Cuyahoga River. Urbanization results in higher imperviousness, which is reflected in the biological indicators for the streams in the subwatershed. This provided a better picture of watershed health, and aided in targeting interventions such as specific restoration projects, something that might not have been possible with the use of only physical and chemical indicators and assessments.

Community relationships and partnerships. The Ohio EPA-NEDO has been undertaking a dual role in their work on the Cuyahoga River watershed. On the one hand the agency staff regulate as compliance officers; on the other hand they actively build relationships and ties with the communities in their service area. A NEDO official explained to me that each Ohio EPA district has a unique personality, and for the NEDO its personality involves building community relationships, which district officials have cultivated over decades. NEDO staff partners with communities in writing grant proposals for various projects and also advise community members and municipal department officials on projects and funding opportunities as technical advisors, fulfilling a supporting role. Decades of knowing key community members and working with them led to the building of mutual trust and a mutually beneficial working relationship, which is captured well by the following statement by an Ohio EPA-NEDO official:
We always help on educate stuff, we show up and do demos, and we always help them with monitoring. We build that trust, so if they call up and say something weird is going on here, then it is not your typical complaint to the agency… We have had our share of arguments, but there is a respect. I know that when these folks call, something is going on and we trust them and then we help them (Personal Communication, 2015).

Although the effective implementation of the CWA is the ultimate goal that directs the work of Ohio EPA, their role as enforcement officials doesn’t preclude them from building community relationships and partnering with members on various projects. An Ohio EPA NEDO official further elaborated on the nature of relationship that the agency has with community members and stakeholders:

When I meet with citizen’s groups, and we talk, I always let them know, even though I get along and have fun with them, I am still linear. My goal is to improve water quality. If I can work within our group to get that done for us and if I walk away and that is not happening, I am still OEPA’s representative whose responsibility is to get water quality better (Personal Communication, 2015).

Building relationship with communities, informally participating in community events, and partnering on various projects provides agency staff members a unique perspective, something that they describe as – understanding things differently. The agency assists communities with education, demonstration projects, and monitoring activities. The trust that has been built over years of working together has led to a relationship where if the community is facing any issues related to stormwater or discharge, wetlands or water quality, instead of avoiding agency attention, they call the
NEDO staff. This is what the official described as “not a typical agency-community relationship” (Personal Communication, 2015). The mutual respect and honesty between the communities and the agency staff helps the communities understand the perspective of the agencies regarding watershed management.

There are various tangible effects from building community relationships. One of these benefits is the ability to mobilize funds. For example, grants through the Ohio EPA Division of Surface Water such as CWA section 319 grants are available for stream restoration and nonpoint source pollution management projects and Surface Water Improvement Fund grants are available for implementation of specific projects that address nonpoint source pollution and/or storm water runoff. The EPA staff at the grant division in Columbus focus on project outcomes and consistency and commitment to projects from the implementing communities, so that overall water quality outcomes are achieved. Communities that have existing relationship with the OEPA-NEDO are prioritized during grant evaluation because an existing collaborative relationship ensures that projects will be completed. Even if project funding is not received for specific projects in the short-term, communities understand the value of undertaking watershed projects and continue applying for grant funding for projects in the future funding cycles.

*Maintaining institutional memory.* Regarding their organizational practice, an Ohio EPA NEDO official described a unique approach that the agency had developed over time and integrated it in their organizational culture – that is, cultivating an “institutional memory” for watershed work. The official explained how within the organization, the leadership has consciously hired and mentored junior staff to transfer their “watershed knowledge”:
I grew up in Cleveland and this watershed is my life because I have physically been here. But the others [at Ohio EPA NEDO] before me were the water quality people and then I am lucky enough to have to them and to be tutored by them. They handed it off to me because they have retired and there are other folks working with me that I am trying to hand off … [retirement] is when you have that knowledge vacuum. We have been really good here in our part for having folks transfer it on (Personal Communication, 2015).

The agency leadership has consciously cultivated this kind of an organizational culture essentially to maintain a consistency in knowledge transfer – especially *tacit knowledge* that they learn overtime through their practice of policy implementation and watershed management – by incorporating a consistent hiring and mentoring practice in the organization. For example, such tacit knowledge would include building community relationships. As a District official explained, “The folks here recognized the importance of building these connections. It is outside of our regulatory authority” (Personal Communication, 2015). According to him, anyone can read a rulebook and regulate, but what goes a long way in building watershed capacity is meeting people, talking to them, and learning from them. He further elaborated on the unique role that the agency leadership played in facilitating the transfer of this tacit knowledge or understanding:

[Two watershed group directors] had my cellphone number and I had been out with them as friends. From a regulatory agency we do that, and that in part, is we have been allowed to do that, other districts there isn’t that amount of close knit camaraderie; it’s kind of *unique* [italicized for emphasis]. Other folks get along with their watershed groups but I don’t think, to the extent that you may know a
person, but globally from a watershed standpoint, I don’t think that happens (Personal Communication, 2015).

Suggesting that Ohio EPA NEDO has a different way of practicing policy implementation, he added:

So I think we are able to be more effective from a regulatory standpoint because people will call me up and we will go to evening meetings, Saturday workshops, training people, we do all that. It has been cool and allows us to do much more done than just what the regulations would do (Personal Communication, 2015).

By participating in community-directed and community-based collaborative activities, maintaining a relationship with community members, and informally networking with other watershed non-agency actors, Ohio EPA NEDO officials have been able to fulfill two objectives. They carried out their regulatory responsibilities related to policy implementation, and also moved beyond the regulatory obligations to be a part of other, more informal, planning and management actions that would build long term adaptive capacity to respond to changes in the Cuyahoga River SES.

Organizational practice and innovation – “Working on the edges of bureaucracy”. Actors concurred that governmental agencies are formal institutions for policy and program implementation where agency staff is mandated to fulfill their regulatory compliance related responsibilities. Management innovations do take place in these organizations, mostly at the operational levels. However, it is interesting to note that the Ohio EPA-NEDO encourages its staff members to work on projects of interest based on their disciplinary backgrounds, apart from their main regulatory and compliance
related organizational tasks. The staff members informally refer to this practice as having a “play time”, which was described as:

The other thing that has been really good about our office is that if you do your work, you can have “play time” ... So if I did my permits, and if I had all my work done then I was allowed to [do] ... watershed stuff. That is my academic training, I did the permitting stuff, it was fun, but it was also to pay the bills, and when I had the opportunity to move into the ecology group I did. But it was my boss and the surface water group and all its management that said – you do your work, what Columbus [Ohio EPA headquarters] expects of us, and you are allowed to have your special projects. Like if you like doing stormwater, have at it; it is still an agency mission thing, but they have always allowed us to work on the edges, which is why I think we have these relationships with the groups (Personal Communication, 2015).

This organizational practice is what a NEDO official described as “walk on the edges and interact” (Personal Communication, 2015). The official emphasized that in practice agencies need not necessarily have a narrow vision of bureaucracy. Officials can be better administrators by interpreting their roles more broadly. Organizational culture and administrative and operational innovations being cultivated at the OEPA-NEDO and used by agency staff is vastly different from the traditional, regimented view of the role of government agencies.

**The Sewer District – a regional “clean water” agency.** The Sewer District is a key regional agency involved in the providing sanitary and regional stormwater services to communities in the greater Cleveland area. The agency itself was created in 1972 by
the State of Ohio as a new regional government unit with taxing authority. It is also responsible for water quality monitoring in the region, and hence is involved in the majority of watershed management activities and programs. Main responsibilities of the agency include operating and maintaining the region’s three large wastewater treatment plants and over two hundred miles of interceptor sewers, maintaining combined sewer overflows (CSO), identifying and regulating the reduction of industrial waste, and undertaking activities that include watershed planning and protection. The Sewer District is regulated by the Ohio EPA, which enforces and monitors the NPDES permits on all of its wastewater treatment facilities. The Sewer District regulates and monitors industrial discharges to make sure they comply with federal standards, and also reviews and approves community discharge permits. The District also has the mandate and the authority as a regional agency to develop and implement programs such as the Regional Stormwater Program in its services area. This program, developed under a court mandate, will allow the Sewer District to address current and/or minimize new stormwater flooding, erosion, and water quality programs. The program was implemented in 2013, but has been challenged in court by communities against the stormwater fees levied as part of the program. Additionally, being the agency responsible for monitoring and reducing combined sewer overflows, the District entered into a Consent Decree with the U.S. Department of Justice, US EPA, and Ohio EPA to eliminate an estimated four billion gallons of CSO annually, and achieve 98% capture of CSO over the next 25 years.

A Sewer District official interviewed for the study agreed that permits and mandates drive most of the work on the Cuyahoga River and in the Greater Cleveland
region. This includes not merely compliance with the CWA, but also with Federal CSO policies. A Sewer District official elaborated on their role:

The sewer district, it is an interesting story because we are a regulated entity and we are also a regulator. We are regulated by OEPA as the delegated state. USEPA promulgates the regulations, Ohio is a delegated state and they manage the program. They establish permit limits on our three treatment plants, they establish requirements for CSO control and we have to meet those requirements. We don't own, operate, maintain the local systems, but they feed us. We can set regulations. Our court order allows us to regulate our local communities… So that is what we do… We have that authority in the court order (Personal Communication, 2015).

Additionally, the court order also requires the Sewer District to regulate local communities by developing discharge permits to regulate maximum allowable limits for TMDL. This work, though mandated under a court order, facilitates the District’s work with the communities. For nonpoint source pollution management such as stormwater, the Sewer District has a unique regulatory-come-partnership approach. The evolution of this approach was, in part, because of regulations, but also as a reaction to regulations. The understanding that drives this work at the Sewer District is that “there’s a lot of things that have to happen. Some of it is regulatory, some of it is just funding to pay to fix the problems, and a lot of it, somewhere underlying all of that, is people have to be concerned and people have to be working together to address the problems” (Personal Communication, 2015). The Regional Stormwater Program that the Sewer District developed was mandated under a court order, yet the District had built a case for a long time with its communities to bring such a program to fruition because it understood that
the nebulous nature of stormwater warrants management at the source. Because communities disproportionately contribute to and are affected by stormwater, pure voluntary efforts to manage stormwater at a community level have proven to be ineffective. The District built a case for a regional stormwater program with communities over 15-20 years, and finally presented it to their governing board for adoption in 2010, with a target to start implementation in 2013. Five of the sixty-two communities in the Sewer District’s service area challenged the program in the court, while the rest of the communities are supportive and awaiting the program to start. A delay like this in the implementation of this program, however, hasn’t deterred the Sewer District in working with the communities via other agency and organizational support in employing certain aspects of the program.

*Cultivating community connections via watershed groups.* The Sewer District intentionally created an organizational program to support and bring watershed groups together. This program – The Watershed Organization Operating Support Program – has been instrumental in supporting individual watershed groups in the region. The watershed groups serve as the Sewer District’s key connection with the communities. A District official explained:

> We get a lot of feedback from the member communities through the watershed groups, so we see it as a really good investment. We get a lot of benefit from that money. That’s why we’ve gotten into that (Personal Communication, 2015).

The Sewer District staff felt that a lot of these smaller watershed groups such as the Mill Creek Watershed Partnership, Tinkers Creek Watershed Partners, and Big Creek Connects are being effective in their own communities and watersheds and in getting
several restoration and conservation projects completed. Their efforts increased the effectiveness of the District’s overall stormwater approach and improving water quality and habitat in the watershed. Supporting watershed stewards that have the right personalities and the right abilities such as leadership, foresight, and flexibility is a key emphasis of the program. As a District official described:

   It is all about the money to get talented people running the organization and they have to be savvy and have to look at the picture and set direction and decide what they want to do. It doesn't happen overnight. Some of these you are not paying top dollar and it is grassroots and you need to sustain your business infrastructure before you can elevate [the watershed groups to point where they can bring in grant funding] (Personal Communication, 2015).

   Further elaborating on the thought process in the agency behind this program, the Sewer District official explained that they consider themselves a “Clean Water Agency”, and that is not just restricted to their work on point source pollution and actions mandated by regulations. The agency thinks about watersheds regionally, based on the agency being a regional watershed authority, as extending beyond a regulatory role to undertake the role of funders and facilitators of nonpoint source pollution management. This is reflected in the following statement:

   I think that’s where it’s really just back to the idea that we are a clean water agency and we recognize that no matter what we do, I mean we could send drinking water quality back into the Cuyahoga River, but that still won’t mean that there are fish and bugs living in there. And then it’s – it sort of gets back to the Clean Water Act – the fishable swimmable – and that’s the basis of the Clean
Water Act. And we have always recognized that it doesn’t matter how good our wastewater treatment plants are – that’s not going to get it fishable and swimmable. So we just think it’s important to support other activities and other things; that for years and years we’ve been doing stream restoration projects. Stream restoration projects have nothing to do with our wastewater treatment plants or our CSO permit, but you’re not going to get fish and bugs to live in a stream unless you give them habitat and slow the flows down and all that kind of stuff (Personal Communication, 2015).

**Planning agencies – consulting, advising, and facilitating.** Even though the Cuyahoga County Planning Commission (CPC) doesn’t hold jurisdiction or authority over land use zoning in the Cuyahoga County, the CPC has played a unique role in the governance of the Cuyahoga River. The CPC serves 59 municipalities in Cuyahoga County, playing only a consulting and advising role, but the CPC has used this role to introduce transformative planning and management ideas and novel ways of collaborating on projects. Because of its nature as a regional planning agency, the CPC’s organizational leadership recognized the incompatibility of designations and land use of political jurisdictions with that of healthy, working watersheds. It undertook several programs to create a regional and collaborative focus. The North Cuyahoga Valley corridor study by the CPC in 1994 was such an attempt, and highlighted multiple aspects of the Cuyahoga Valley to focus it as an entity that could shape the resurgence of the region. CPC also supported the creation of the Towpath Trail, pitching the concept as a regional construct to create capacity within municipalities to work together across political boundaries, and mobilized organizations to collaborate on the project. The CPC
played a key role not just in directing attention, but also funding to the Cuyahoga Valley. Starting with the North Cuyahoga Valley Corridor report, the CPC leveraged various funding sources such as Coastal Zone Management Act, administered in Ohio via Ohio Coastal Management Program of the Ohio Department of Natural Resources, to do a Linking Corridor Plan for the Valley. More recently, in 2014, the CPC along with Cleveland Metroparks and several other partners, leveraged 9.1 million in federal and state funding to complete a section of the Towpath Trail in downtown Cleveland in the Scranton Flats area.

A senior CPC planner described her work on the Cuyahoga River Watershed as “facilitative, advising, and educational” (Personal Communication, 2015). She illustrated this with the example of a project that entailed the formation of the Mill Creek Watershed Partnership. The CPC facilitated bringing together nine municipalities, three Community Development Corporations (CDCs) and their boards, several city councils, non-profits, and Catholic cemeteries in the Mill Creek watershed to form this partnership. Working with the director of the Cuyahoga River Restoration (CRR), the CPC planner initially targeted forming a Regional Council of Governments based on the willingness of the municipalities to come together as a watershed collaborative to leverage project funding as an official entity. The individual municipalities however, were reluctant to commit to a formal collaborative agreement such as Regional Council of Governments. Therefore, the CPC planner along with the CRR leadership used a mechanism called Resolution of a Partnership to form the watershed collaborative. CPC plays a consulting and advising role with the municipalities in their area of jurisdiction in a manner that is conducive to overall regional management goals. And lastly, the CPC plays an educational role to the
municipalities in their service area, and also works with communities to get them interested in projects that fulfill overall goals of the CPC. Talking about their role with an example of their work on Mill Creek Watershed Partnership, the CPC planner explained:

The role of the planning commission is to get parties interested [to get buy-in] on something that needs to get done that matches with the CPC’s mission and for the general environmental well being. Once they are interested and want to know more about it – the role of the CPC is to educate them. For example some of the Mill Creek political jurisdictions wanted to do a council of governments so I researched that for them on how that works. And finally, if the communities want to move beyond that and actually do something then the CPC connects them to the right people like the NEORSD for the Mill Creek Coordinator funding (Personal Communication, 2015).

Evident from the descriptions of various actors, including agency staff members, is that the governance of the watershed has no specific or set definition. I heard from most agency members that they tried as best they could to meet their organizations targets and mandates, while innovating within these, creating new initiatives, introducing novel ideas, finding newer ways to form relationships with other agencies. Each actor practiced watershed management differently than others. A discussion on governance of the Cuyahoga River watershed led most actors to reflect on their experiences in working with the RAP process.

**Designation of Areas of Concern and the Remedial Action Plan process.** Most of the governance actors that I interviewed have been involved in some capacity with the RAP process (as described in Chapter 5), either at the beginning of the program, or have
become involved as it progressed. These actors have, overtime understood the advantages and the limitations of the program. Some watershed managers have been “smart” about leveraging the program to create regional watershed capacity. Most talked about the RAP being a good convening party for watershed stakeholders and that it provided a forum for communication.

*Institutional framework – “top down” or “bottom up”.* The RAP process, when started, didn’t have a clear institutional framework. According to the early participants, the RAP, by its very nature using an ecosystem-based approach, was a reaction to top-down policy that didn’t heed ecosystems; yet, it lacked the strengths of a bottom-up grassroots approach (as described in Chapter Five). The Ohio EPA and the first chair of the RAP coordinating committee were essentially “figuring it out” as they went about designing the Cuyahoga River RAP. The Ohio EPA brought on board the directors of the Sewer District and Northeast Ohio Areawide Coordinating Agency (NOACA). A long-time watershed steward, who was intimately involved in the RAP process in the beginning, and was instrumental in setting it up, recalled the early days:

> It was really kind of an invention as we went along kind of a process […] I am not sure exactly how it was, but I was asked to chair the committee. I sometimes jokingly say they asked about a half a dozen people and they all refused and then finally I was the one that was foolish enough to take it on. When I was offered the job there was no real institutional structure at all. It was just like, you are the chair figure this thing out. It was really to devise the plan, but it was never any legal formal framework for determining how that plan would be implemented once it was formulated. So, it was pretty much a good faith effort in principal. As it
worked out...again, since there was no roadmap for it and it raised all these complex problems that we really didn't have a handle on what all the problems were (Personal Communication, 2015).

The Ohio EPA was responsible for appointing the RAP coordinating committee, which would bring legitimacy to the process and would oversee the creation of the Remedial Action Plan itself. The RAP couldn’t be housed within an individual agency as each agency had its own agenda and organizational vision and goals. Therefore, an independent body constituting of a committee formed by representation of actors from various agencies and organizations seemed to fit. Bringing the committee together was a difficult process. An actor noted that there wasn’t any natural unifying motivation [because the river was still very polluted] and clear direction, other than the broad idea that the RAP is supposed to clean up the Cuyahoga River. There was a broad recognition that even after nearly two decades of CWA and point source cleanup, the Cuyahoga River was still far from what was desired in terms of water quality and habitat goals. There was desire among the stakeholders to do something about it, but how this was going to be done was unclear. Further, this process was going on in the late 1980s-early 1990s, when the agencies were still functioning under the broad environment of the federal directive era of water pollution control, characterized by litigations, which made agencies wary of collaborating and being extremely cautious and preoccupied by administrative procedures (Sabatier et al., 2005). An Ohio EPA NEDO official explained the early days of the RAP as:

At the very beginning, everyone is saying – how is this going to affect my life? And they were all there engaged in the beginning but it wasn’t like letting your
guard down and saying sure what do we need to do. Everyone had their walls up because the federal EPA at that time, because this is a USEPA thing, it is a regulatory thing, so the folks were like what is the hidden agenda of the regulatory coming here. Everyone was very guarded (Personal Communication, 2015).

The coordinating committee was comprised of members from all local agencies (water and wastewater, health, planning, and so forth), industrial and business interests, recreational stakeholders, and community members. These groups were classified into stakeholder groups, but the committee didn’t have a clear conceptual role. Because of the animosity under which the actors had functioned in the past, there was a lot of tension between the groups in the committee meetings. The chair of the committee played a key role in selecting issues that would guide the RAP, the first of these being selecting the beneficial use impairments (BUIs) of the river, and would set up deadlines to direct the planning work. Overtime, this mediated effort started reducing the animosity between groups, coupled by the recognition that the RAP had no regulatory authority. Some actors were not keen to keep up with the planning process, but most stakeholders understood its value. An Ohio EPA NEDO official expressed appreciation:

It is not like that anymore because they have realized that the RAP doesn’t have any real regulatory authority. So some people have gone away saying that it is not going to hurt my industry so I don’t care anymore. Some people recognize it for what it is, which is one way of funding really good projects. It is a process to get water quality improvements done but doesn’t have that regulatory overtone. It is like if you got o the post office and you are doing a job application and you are a
military veteran, you get extra points on your application. If you are going for federal funding in the Great Lakes area and you are in a RAP area, you get extra points (Personal Communication, 2015).

The focus of the RAP process was addressing questions like – “What do we know? What don't we know? What do we need to know?” by providing a forum (Personal Communication, 2015). Therefore, the steps involved in remedial action planning were: 1) figuring out what one needs to know; 2) collect data; and 3) develop remedial actions and calibrate the results to move towards delisting. Several of the BUIs suggested by the IJC under the GLWQA didn’t pertain to the Cuyahoga River, so the RAP committee developed its own list of BUIs for the watershed, some of which are unique to the area. One example is the BUI on aesthetics, which is key for the Cuyahoga River given the historic and recreational interest among stakeholders.

Because the RAP was a pioneering initiative and didn’t occur in an “already flowing stream” of initiatives/programs, it functioned in a “jurisdictional vacuum” and had no real authority. Based on traditional policy/program indicators it could be argued that the RAP has been around for almost 30 years and hasn’t met AOC goals in terms of delisting targets, but that doesn't mean that the RAP hasn’t been effective. The RAP process, had an unintended consequence, something that was a part of the process but not targeted as an outcome – the collaborative capacity and networks for governance. The forum that the RAP provided and the coming together of the stakeholders in the form of a coordinating committee overtime wasn’t restricted to the actions under the RAP itself, but moved well-beyond to several other aspects of watershed management in the Cuyahoga Basin, including green infrastructure and low impact development projects,
attention to urban forestry in the region, and wetland restoration. The non-profit arm of the RAP, the Cuyahoga River Restoration (CRR), previously the Cuyahoga River Community Planning Organization (CRCPO) played a key role in this process.

*Cuyahoga River Restoration – “Catalyzing action”*. Being an appointed committee, applying for grants and working on projects was not possible for the RAP coordinating committee. The committee members created a non-profit fiscal agent, which they called the Cuyahoga River Community Planning Organization (CRCPO). The RAP process had no federal funding attached to it. The members of the coordinating committee paid annual dues for their RAP membership. The CRCPO was created so that the RAP organization could apply for grant funding from various agencies and programs to carry out the remedial action planning. Actors that I interviewed agreed that the early leadership and staff of the CRCPO had actively built watershed capacity. The CRCPO, as a non-profit entity, also had more flexibility than its parent body, i.e. the RAP coordinating committee, which allowed CRCPO to be more innovative in its approach to watershed management. The organization’s actors understood that the watershed health cannot be understood in binary terms – if there are delisting targets to be met it is unhealthy and once the targets are met, that is the end of the process – watershed management in fact, is an ongoing process, which also has a life beyond the delisting goals and targets. A CRCPO staff explained the thinking about delisting that drove the organization’s work:

This [delisting] is not primarily about restoring a healthy functioning watershed. Delisting is just about these reaching arbitrary numbers, although not totally arbitrary, someone decided this is clean enough since the beginning of the
environmental movement and I was there. The question has always been – How clean is clean (Personal Communication, 2015)?

The constitution and the nature of the CRCPO severely limited what the organization could do. The main role of the organization, as the name suggests, was to do planning. There was also no consistent funding available to the organization, other than the membership dues paid by the RAP coordinating committee organizations, and the CRCPO couldn’t seek out grants for implementing projects. They also understood that planning, though important, would not yield results unless there are associated implementation actions. Functioning within these constraints, the CRCPO staff assumed the role of “coordinators” and “catalysts” in seeking out projects where they could partner with local watershed groups, government agencies, and other organizations. Since the CRCPO is not tied to specific subwatersheds geographically, and focused primarily on main stem of the Cuyahoga River, it doesn’t have the necessary connections with the subwatershed communities. Therefore, a former director of the CRCPO spent years building watershed capacity by facilitating the formation of the tributary watershed groups in the Cuyahoga valley, and leveraging programs such as the Balanced Growth Plan program, to enable collaboration between communities and seek out grant funding for projects. Three key roles that the CRCPO fulfills are educating communities, connecting stakeholders, and bringing new projects to the various organizations and agencies associated with the RAP. A CRCPO staff commented that, more recently, the organization has started undertaking projects where there is a lack of somebody else to do it. For example, partnering with the CPC, they spearheaded a project – Habitat for Hard Places – to create soft fish habitat in the shipping channel section of the river.
As most of the communities in the watershed relate to the tributary watersheds and not the main stem of the Cuyahoga River and CRCPO being primarily responsible for this section, the organization didn’t have a direct relationship with the tributary communities. Therefore, the CRCPO lacked a “natural home” geographically and an interviewee described that the organization would, “die a natural death once the AOC meets all the delisting targets” (Personal Communication, 2015).

**Restructuring of the RAP.** In 2015, the Ohio EPA officially restructured the AOC program. This was done to focus on management geared towards achieving delisting targets. This restructuring was also in response to changing focus of both federal and state EPAs. The Ohio EPA described this as a “paradigm shift”. For the Cuyahoga River AOC, this meant separating the RAP coordinating committee from the CRCPO. The new committee is termed as the RAP advisory committee, with a chair and a co-chair appointed from the Cleveland Metroparks and the Cuyahoga County Board of Health, respectively. This step was taken to help the RAP transition from planning to implementation, and to better leverage GLRI grant funding towards delisting BUIs in the Cuyahoga River. The chair and the co-chair have been working to connect and coordinate the various projects of their respective organizations, as well as the projects that other advisory committee members are pursuing within their organizations, thus bringing a concerted focus on meeting delisting targets in the watershed. The CRCPO has been renamed as the Cuyahoga River Restoration (CRR, signifying a shift in the mission of the organization so that it could seek funding to carry out projects, including those that are independent of the RAP. The shift in the mission of the organization from “planning” to
“restoration” is also intended to increase the organization’s existing capacity for undertaking implementation projects, and build long-term capacity for its sustenance.

AOC – “to be or not to be?” Some of the actors I interviewed thought that management of the Cuyahoga River should be thought of beyond the AOC program. Some actors expressed the opinion that an AOC designation undercuts the progress that the Cuyahoga River has made in water quality over the decades. Because AOC status is associated with waterways with severe BUIs, and because the Cuyahoga River has not met delisting goals over the years, they were concerned that this might be associated with a perception that the watershed has not seen major improvements. Many are of the opinion that the negative view associated with the Cuyahoga, due to its status as an AOC, needs to change. Cuyahoga River has made tremendous progress over the years and the AOC designation and the related BUIs are overshadowing the water quality and habitat improvements.

For example, for urban watersheds such as Big Creek and Mill Creek the level of imperviousness is 40-50% in some areas. This level of imperviousness is considered to be beyond restoration, and meeting the target scores for delisting for sections of the watershed would take several years. Several dams in the Cuyahoga River watershed such the Kent dam and the Munroe Falls Dam have been removed, which has improved sedimentation and aquatic habitat issues, and have garnered recreational benefits in terms of increased and continuous access. Several sections along the main stem of the Cuyahoga River meet and even exceed exceptional warmwater habitat quality attributes. The return of freshwater mussels near Southerly wastewater treatment plant and an
increase in the population of steelhead trout along the main stem of the Cuyahoga is an indication of healthy habitat.

Further, due to the presence of large number of municipalities, several subwatershed groups, and hundreds of data points that need to be measured for delisting purposes, there is intense competition for funding resources. Funding organizations and bodies have difficulty in committing funding resources for a watershed where there are several watershed entities and lack of a concerted action or initiative to coordinate funding and project implementation activities. Actors have over the years advocated the state and federal agencies for more grant resources and opportunities to fund implementation projects in the Cuyahoga River watershed. The restructured framework for the AOC is a reaction to such efforts. The results of this restructuring will only become evident in the coming years.

**Land Use Zoning and Watershed Management**

**Encouraging good land use practice.** Governance actors agree that the driver for water quality is land use. Ohio being a Home Rule state, the county planning agency, i.e. the County Planning Commission, doesn’t have decision-making power regarding land use. Land use zoning falls under the purview of individual municipalities and townships. A long-time watershed steward pointed out that a deeper understanding and respect for watersheds and the energy of water has influenced his work, and that governance systems and land use should be based around this principle. Being a state issue, the push for regional land use planning should come from the State of Ohio. The lack of such state level push has led regional planning agencies to innovate on their own to influence land use.
Land use is a regulatory boundary that Ohio EPA-NEDO doesn’t cross. Although the agency doesn’t control land use, it is responsible for environmental impact and water quality, which is inextricably linked to land use. Just controlling the environmental impact without influencing land use doesn’t garner requisite results because the tributary watersheds in the Cuyahoga Basin are heavily urbanized with undesirable land use impacts such as high levels of imperviousness and loss of floodplain storage. The agency therefore, has tried to build good relationships with the community to indirectly influence land use. In the words of an Ohio EPA NEDO official:

So they will sometimes call me either to complain or say hey this is going to happen here and I can give them my opinion of that hey if you develop all this, this is going to be the outcomes. Or if you develop maybe this way then we can actually offer some help. But when it comes to the actual land use decision we don’t have it. Unless that land use decision involves something that we have permit authority over (Personal Communication, 2015).

An initiative, the actors talked about in the interviews was creation of the Towpath Trail in the Cuyahoga Valley and the federal designation of the National Heritage Corridor. This initiative demonstrated good land use practice among the municipalities in the Cuyahoga Valley, and was one of the first initiatives of this kind with educational value for the communities. Congress designated the Ohio & Erie Canalway as a National Heritage Area in 1996 in response to grassroots efforts by two nonprofits working in the Cuyahoga Valley and further south of it – the Canalway Partners and the Ohio & Erie Canalway Coalition. The purpose of the National Heritage Area designation is to provide funding to facilitate the management of the designated
area through grassroots partnerships and collaborations between community residents, local businesses, local governments, and non-profit organizations. Non-profit groups leveraged this designation to create recreational opportunities, preserve historical resources, and form and maintain a park system along the historic towpath trail. A previous CVNP superintendent instrumental in this process explained that the creation of the Towpath Trail was not just instrumental in creating public access to the Cuyahoga River, but served a much bigger purpose:

Part of the plan was public access, so getting the towpath built. But it was really much more than that. It was about providing good land use practice. It was about promoting sustainable economic development, it was a much broader set of goals (Personal Communication, 2015).

A federal designation such as this also works around the Home Rule. Rules and procedures associated with the designation and related funding didn’t affect the land use zoning itself in the area, something about which initially the communities were wary. However, collaboratively working on a preservation and restoration project, without affecting the existing land use zoning, educated the communities about good and sustainable land use practices. This designation and initiative also transcended community boundaries and created a regional focus in the watershed. Over the past decade or so, there have been further attempts at linking land use and watershed based planning through state and regional level programs.

**Regional land use based planning approaches.** A CPC planner stressed that regional thinking and policy is needed for the transformation of land use. This would require a shift in understanding of policy, and the manner in which it is currently
interpreted and practiced. While there have been some state and regional level efforts at smart growth and watershed based land use planning (see below), in the Cuyahoga River watershed these efforts are voluntary for the participating communities. There is no overall policy or regulatory framework that would require sustainable land use practices leading to better watershed health because Ohio is a Home Rule state.

*The Balanced Growth Plan program – a regional partnership approach.* Actors describe the program as a *good governance mechanism* to prevent sprawl and protect water quality on an institutional basis. Smart land use planning reinforces watershed work; therefore, the RAP non-profit CRCPO leveraged the program for creating BG plans for tributary watersheds in the Cuyahoga Basin. The BGP, as described in Chapter 5, is a state program. To the actors working on the Cuyahoga River watershed, BGP was a new mechanism to build capacity for collaboration and land use change. Watershed communities under BG plans are required to create partnerships with each other and with other agencies and key stakeholder organizations, which builds capacity for doing watershed work. The plans, if followed by communities in planning their land use, don’t preclude development opportunities. A former CRCPO director describes the BGP as:

> So, the balanced growth initiative require that you create partnerships with the communities and they work together and they create what is important in the life of the stream, but also not take away from their ability to be prosperous communities… Balanced Growth is a way to continue to work and have rapport with all the local governments because it addresses things that they do (Personal Communication, 2015).
Ever since the BG planning framework was introduced in 2004, the tributary watersheds in the Cuyahoga Basin were some of the first watersheds to embark on this planning process; Chippewa Creek Watershed was the first to have an approved BG plan in 2008. There is more land under balanced growth plans in the Cuyahoga River watershed than in the whole of Ohio. The BGP provides a way, with its inherent structure, to work with local governments and collaborate on projects. The CRCPO, whose primary purpose is to meet delisting targets and facilitating connections between watershed stakeholders, was instrumental in bringing the balanced growth approach to the Cuyahoga River watershed. The CRCPO staff went outside their formally designated RAP institutional framework to informally build relationship with the communities to build capacity for doing the BG plans.

Though three tributary watersheds in the Cuyahoga Basin have approved BG plans, with fourth on the way, actors noted that implementing the plan has been a challenge because there is no formal institutional and funding support under the BGP. An actor noted that an issue with the BGP process is that by its very nature it facilitates conservation projects, and doesn’t cover restoration actions, which is key for most urban communities in the Cuyahoga Basin. A local watershed group director described the 2006 flood in the Cuyahoga Basin as a “cathartic event” that made the case for balanced growth planning:

[I]t was about a 500 year rain event that swept through the Chippewa Creek Valley and Southern Kent part of the watershed … Chippewa [creek] got out of its bank, went down the street, wiped out a lumber yard, and carried all their lumber downstream into the park. Some of it is still jammed on the hillside on the
steep valley walls … Everybody started blaming everybody … Anyway, it was very cathartic in terms of getting people talking all over the watershed about the need to be collaborative, you are up and downstream from somebody. Everybody's behavior has an effect on stuff like this. So, we really leveraged those storms a lot to help incubate some of these groups and their conversations. They all get it because indifference negates good behavior. If you don’t have everybody working together on the stream, that message resonated pretty well (Personal Communication, 2015).

As evident from the above statement, the flooding was an event that the CRCPO used to make a case for better land use planning among the communities and incubate a group to undertake a balanced growth planning process for the Chippewa Creek watershed. The announcement about the plan by the Mayors of the municipalities right after the flooding event increased their political capital. The decision to undertake the balanced growth planning process was made before the floods, but the flood events catalyzed action and helped the public and community members understand the importance of such planning.

**Watershed Networks, Collaborative Work and Partnerships**

I provided a background on collaborative management activities in the Cuyahoga River watershed in Chapter 5, and also discussed the networks of stakeholders involved in watershed planning. Here I delve deeper in to actors’ experiences of collaborations, collaborative initiatives, and network relationships that they have created over the years in their work on watershed management.
A County (CPC) planner explained the meaning of the terms partnerships, networks, and collaborations as perceived by practitioners. **Partnerships** are the most common, informal, and loose form of working together on projects. Organizations partner with other organizations and agencies on seeking funding, implement projects and plans, and generate project outcomes. The nature of the projects can vary from restoration, to mitigation, to various technical studies. For example, the CPC partnered with the CRR, the Ohio Department of Natural Resources (ODNR), and the Port Authority to work on the Habitat for Hard Places project in the Cuyahoga shipping channel. **Networks**, on the other hand are formed when agencies or organizations work with other organizations/agencies to draw on their knowledge and expertise on various aspects of management. For example, the Sewer District reaches out to the CPC for their GIS expertise on creating demographic maps, the Mill Creek watershed partnership consults the Sewer District for water quality data for creating their watershed action plan and West Creek Conservancy reaches out to Tinkers Creek watershed partners for creating education materials for volunteer training programs. Lastly, **collaboration** means a formal agreement between parties to create a formal entity via a memorandum of understanding, or service agreement, or a formation of a formal entity such as a regional council of governments. For example, the formation of Mill Creek Watershed Partnership is a collaboration, where the municipalities in the watershed entered into a partnership service agreement.

**Watershed groups.** The most common form of working together in the watershed, as evident from the interviews, is through watershed groups or partnerships – whether it is the municipalities in the subwatersheds that form a partnership through
watershed groups, agencies facilitating formation of such groups and partnering with them on various projects, or various watershed groups collaborating on regional projects. An Ohio EPA official remarked that the extent of watershed groups working on the Cuyahoga River is unique in Ohio, which exhibits dedicated grassroots efforts toward watershed management. The proliferation of many watershed groups however, also pose challenges in terms of sustenance of the groups as they generally compete for the same sources of funding. There is also a mix of watershed groups, in terms of how they were formed, whether being agency led, like the Mill Creek Watershed Partnership, and some emerging completely through grassroots and local efforts, such as the West Creek Conservancy. A Sewer District official explains the formation of watershed groups as:

It seems like in life in general it’s either somebody has to do it because of regulations, somebody throws a lot of money at it, or somebody really emerges as a champion and causes it to happen by sheer force of will or whatever (Personal Communication, 2015).

As I described previously, the Watershed Organization Operating Support Program by the Sewer District supports watershed groups in the Cuyahoga River watershed, so that there is consistency in persistence in terms of actions related to watershed management at the grassroots level, actions that necessarily the Sewer District wouldn’t be directly involved with. Traditionally dues paid by watershed communities have sustained such groups, which affects the work of these groups based on the willingness and the ability of the communities to pay the dues. Supporting the groups with operating dollars helps sustain the groups, as they don’t have to look from project to project for keeping the organizations functioning. The groups enter into a Service
Agreement with the District, which helps in fulfilling the District’s goal in the communities. This program contributes to overall watershed management in three ways. First, as a result of consistent operating support grants that the watershed groups receive, they don’t have to look for other grants to support their operations, and can use their grant writing abilities to leverage grants for various watershed projects. According to a Sewer District official, two million dollar in supporting operation funds to various groups over the past years have yielded thirty-two million dollars in project funding that the groups have been able to leverage. Second, each group, due to the support provided by the Sewer District and other watershed groups that are a part of the grant support program, has grown in their ability to function as an effective watershed organization. They have been effective in leveraging grants, setting the direction of watershed management, and garnering community support and building community social capital. Lastly, watershed groups have also worked with communities in directing them to adopt good watershed management practices, an example of which would be adoption of riparian setback ordinances by several municipalities in the Big Creek watershed. A strong community leader and watershed group director describe how she found a unique role that their watershed group could perform:

Like I say, we kind of found a niche of where we could help. We view our role as sort of being somebody who greases the skids. Somebody who makes the way easier to get things done […] During that time we had a public education process that was established. We went around and talked to people. We did a lot of stuff. The usual stuff; petitions, church groups, you know, the dog and pony shows (Personal Communication, 2015).
The watershed groups have worked with their individual communities, but also with the agencies to help facilitate smooth interactions with the communities in their services areas. Educating watershed communities on practices for sustainably managing their watershed has been a key role for most of the watershed groups. Watershed groups such as Friends of the Cuyahoga River (FoCR), also played an early and pioneering role in policy education. The group was formed when the 1987 CWA amendments came about, and around the time when the Cuyahoga RAP was formed. One of the key roles that FoCR performed was to understand policy and educating community members about it – bringing essential information to the communities about how the new policies affect their communities and what roles various agencies played in implementing the policies. Another distinctive role that the FoCR plays for the communities that it serves, is finding projects that the communities and the watershed agencies are both interested in undertaking, that are chosen based on community inputs and overlaps with community and agency priorities, and that will go towards fulfilling overall policy and water quality goals. Finding projects that the communities are interested in undertaking makes it easier to seek project funds collaboratively, facilitates better implementation, and ensures longevity of the project and also monitoring of water quality in the long-term, using community volunteer based monitoring programs.

The Sewer District has sought to bring the watershed groups together to collaborate on various programs and projects and exchange knowledge, information, and technical expertise. This exchange of information and collaboration, according to the
watershed group staff members, is especially important to tackle the issue of urban runoff. A CPC planner describes the watershed partnerships as:

The partnership provides a place and opportunity for the actors and stakeholders to convene and discuss relevant issues. They [the watershed groups] should be able to hold hands and facilitate things locally and be able to be a voice of the community (Personal Communication, 2015).

Other agencies such as NOACA have also been instrumental in creating community capacity by incubating some groups. During the initial setting up of these partnerships, NOACA provided staff support, facilitated community meetings, recruited trustees for the partnership board, and wrote the bylaws for the organizations. The watershed coordinator grant administered by the ODNR also helped in incubating the watershed groups.

*Understanding different viewpoints – listening to all perspectives.* The self organized watershed groups such as the Friends of the Crooked River and West Creek Conservancy and others emphasized on the importance of *working together.* A critical understanding that the subject developed was that working collaboratively and making connections was needed, not just with like-minded actors, but with others that didn’t necessarily shared the same views or perspectives. This “revolutionary” work, a watershed group director describes, was due to a deliberate role that the organization had carved out for themselves:

[W]e were very curious and we talked to everybody. We did say from the very beginning, we are not only going to talk to our friends we are going to talk to everybody. If you want to know the issues then you need to know how people
think who are in opposition to your point-of-view. Teachers, professors, land owners. Just anybody who would call us and talk to us. Usually people wanted something from us and we tried to give it to them. Something that takes an hour that can make the difference between creating a friend and not remembering is, writing a letter of support … That was something, as you develop this network, you keep and use that network to help other people (Personal Communication, 2015).

Understanding an opposing viewpoint helped the group in making efforts to find common areas of working together, negotiating, and finding overlaps in organizations and project interests. Weaving a network of actors that could be helpful in watershed management work was also a conscious and intentional activity that the watershed group leadership indulged in. Writing letters of support for various organizations was one way to do that. The director also noted that based on their 30 years of work on the Cuyahoga River watershed, they learned that this manner of working together helped them in conceptualizing, designing, and implementing projects in a relatively shorter period of time. Describing the transformation in relationship between watershed groups and agency actors through collaborative working relations and open dialogue and communication, the watershed group director remarked:

Ever since then I have been a good partner to the city of Akron. I’m now involved with their CSO and it was not an easy transition because I had been so critical of the city of Akron and so vocally critical – publically, vocally critical. It was a pretty hard transition to make, but once I established some trust with some of the
major players it was like, hey go talk to [the watershed director].... She hated us and now listens to what she is saying about us (Personal Communication, 2015).

**Networked governance in Cuyahoga River Watershed.** The governance of the Cuyahoga River watershed consists of a decentralized and pluralistic process that includes the involvement of non-state actors coordinated through networks. I described the structure and three areas of the networked governance in Chapter 5. Here I explore “how networks are constructed by individuals to create meanings in action, and so it highlights the importance of beliefs, meanings, traditions and discourses,” and I unpack the actual and the contingent beliefs and actions of the individuals involved in the governance process (Lewis, 2011, p. 1227).

**Informal networks shaping “tides of change”**. While several actors agreed that federal policies in the past have forced actors to collaborate, and actors have also understood the value of collaborating over time, the creation of networks for watershed and environmental work predates such policy-induced collaborations. Speaking about the creation of the institutional structure for the Cuyahoga RAP, an actor told me an interesting story about how informal relationships and networks with other actors helped them create a formal mechanism. This actor and directors of NOACA and the Sewer District had all been members of the northeast Ohio Sierra Club, and had exchanged ideas about watershed stewardship. Around the time when the AOC program was being designed, the International Joint Commission asked the two directors to be a part of the committee that designed the program. These actors also knew some of the most dynamic members of the Ohio EPA staff through their watershed work. When it became clear that the Ohio EPA and the regional watershed agencies would have to design an institutional
mechanism for the Cuyahoga RAP, these actors pulled resources and ideas from the informal networks that they had created. Since there were no set guidelines for the creation of a RAP except that it had to have a broad stakeholder and community representation, the key actors (Sewer District and NOACA directors and the Ohio EPA person) brought in their pragmatic vision about watershed stewardship, developed through their work and association with the Sierra Club, to design the Cuyahoga RAP.

The agency actors felt that the history of work by agencies in the Cuyahoga River watershed, where they governed with an iron fist during the first wave of NPDES and technology based point source cleanups, left a less than favorable position to create a ground-up, multi stakeholder process like the RAP. Hiring a “neutral” person with no government agency affiliation was a key step in the direction. What shaped their work was a pragmatic vision that they had cultivated and shared through their informal interactions:

It wasn't that they [RAP coordinating committee members] all came in because they had suddenly gotten a vision of a beautiful, pristine Cuyahoga flowing down and boy! We are really going to get behind this and we will do our part and we are going to push together and make it happen. So, I think that's really a critical part of that understanding, you know, what was going on there and I think to some extent that probably still goes on (Personal Communication, 2015).

They key understanding that they had developed that directed their work on setting up the RAP program for the Cuyahoga was that groups need to have common goals and outcomes in order to coordinate. Just providing opportunities for coordinating, like simply providing the RAP platform, doesn’t mean that collaborative outcomes would
happen automatically. Producing desired collaborative and policy outcomes needs directed leadership and common goals that are achievable for all organizations that are a part of a collaborative. This key understanding would go on to shape the work that this governance actor has done recently in creating an innovative governance entity in the Cuyahoga River watershed (which is described the initiative in detail in the New and Innovative forms of Governance Section).

**Interagency cooperation – parallel missions, overlapping actions.** Agency actors associated with Cuyahoga River management forge networks with other agencies for various purposes. An Ohio EPA NEDO official explained that some of the push to the agencies to coordinate their work is also “top-down” and comes from the governor of Ohio. Different agencies such as Ohio EPA, ODNR, Sewer District, Soil and Water Conservation District have differing missions. These agencies form relationships with each other and other agencies, so that they can find common areas for work, which also conforms to their overall organizational missions. An Ohio EPA official gave an example of what the missions of various agencies are and how they find overlapping areas of work within parallel organizational missions:

[S]o when you are looking at the State agencies we don’t always have the same mission. ODOT [Ohio Department of Transportation] has a specific mission of getting people from point A to point B ... When they expand roads there are always water quality impacts. That is why we regulate ODOT. I have sued ODOT several times [laughs]. We do enforcement within ourselves. The governor doesn’t like to see that but that doesn’t mean that ODOT is not subject to CWA. I have had enforcement against the Turnpike … So expect people regardless of who
you are, to comply with the rules. Within the state the governor wants us to get along so that we don’t have to do that [sue the other entity], but that doesn’t mean that our missions are aligned. You look at the Natural Resources [ODNR], and they are huge. They have multiple missions, you have soil and water stuff that is kind of aligned with what OEPA does. They are driven more by agriculture and protection of the soil resource. But that is a water quality thing. So there is a parallel thought process. We work with them. You look at the Fish and Wildlife folks, that is [agency missions] not always parallel, because fish and wildlife exists in part to promote the recreational use of our waters. They do not measure the fish stock, and that is not necessarily what I as a stream ecologist want, they are doing it for a different reason. But within that same group you have the division of wildlife that has the scenic rivers people, and the parks people, endangered species folks. They are more of ecologists. So there are multiple different things, we generally all work together, we don’t always agree on everything (Personal Communication, 2015).

Describing the work that the agencies do together a watershed group director remarked, “there is just a whole other cadre of people [Ohio EPA, City of Akron, Metroparks] … who had this magical way of working together and finding ways.” Elaborating on their working relationship with the Sewer District on watershed management, an Ohio EPA NEDO official explained:

So that is where we do our thing i.e. writing the target compliance and ultimately enforcement. So from that standpoint the sewer district is a regulated entity. From a standpoint of watersheds, they are much more of a partner because they have a
whole program designated to do monitoring, so we talk and share information when it comes to just assessment. They do a lot of restoration work. So in that way we don’t always view them as a regulated entity. We view them as a watershed partner (Personal Communication, 2015).

This statement uniquely captures the dual roles that agencies play with respect to the CWA and its various provisions. It was evident to me that the key government agencies have a good understanding of the need for cultivating relationships with other agencies to increase the effectiveness of the implementation and management of their nonpoint source programs. For the Ohio EPA this would mean meeting the targets of their TMDL program for the various sections of the Cuyahoga River. For the Sewer District this would encompass their regional stormwater program.

**Community networks and partnerships – “controlled chaos.”** Actors also value connections with the communities. I described Ohio EPA NEDO’s role in building community connections for managing stormwater more effectively in their areas of jurisdiction earlier in the chapter. A NEDO official emphasized on the fact that even though TMDL was originally part of section 303(d) of the 1972 CWA, it took more than 20 years to start implementing the TMDL program. The official wanted to drive home the point that since agencies have no authority over nonpoint source issues, due to municipal Home Rule in Ohio, managing anything on the stormwater front requires collaborations and partnerships. When I asked him how he would describe his work with the communities, his reply was “controlled chaos”! If you are trying to find a model, I don’t know what in the hell could be one,” and then thoughtfully added:
And that is that partnership that you never trained for in college and our regulatory programs don’t necessarily say that stuff. That is where the legacy of this office comes into play where they have promoted that kind of work (Personal Communication, 2015).

This statement highlights that two aspects of the Ohio EPA NEDO official’s work, governance and policy implementation, is to a large extent learning-by-doing, something that one learns through practice overtime. The NEDO office has built an organizational culture that encourages community partnerships and collaborative work.

The director of a watershed partnership in a Cuyahoga River subwatershed that is considered to be a very effective watershed group and urban land conservancy by most watershed managers working on the Cuyahoga Basin, describes his experience of creating a network of support, relationships, and expertise:

Really it comes down to forming a relationship with municipalities, CDCs, watershed organizations, all levels of the Park District (the acquisition people, the trail people, the natural resources people) … the Metroparks, they are quasi-governmental, but you have to pull in the local groups too; so the church groups, schools, boy scouts. You got to have this diverse network of partners, not just from volunteerism and outreach, but from the point of view of funding too (Personal Communication, 2015).

Describing his work and the work of his organization, which was a complete community based grassroots effort and has over time become one of the most vital
watershed assets in the region, the director explained that watershed “coordination” is about communication and connection with all levels, saying:

[T]he watershed groups are the coordinators; that is their job to have this cross communication and cross-pollination. You have to have all levels … So back to the network it comes at two different levels – whether it is a finding network, being able to pull in partners and resources, as you need, or the ground up. Lot of times we are ground up. We are this entity that thrives on volunteerism and our support base and that comes from what we did here (Personal Communication, 2015).

The agencies and other organizations bridging for technical and policy related expertise, and at the community members and volunteers that form the local support base of watershed groups, are important for the longevity and effectiveness of the groups and the projects that the groups undertake. Almost reflectively, the director added:

I personally pride myself in keeping the good relationships. What I like to draw from is the collaborative pool of resources, because we are all great at something and we may be great at many but we are not great at all (Personal Communication, 2015).

This simple understanding and self-reflection has been instrumental for the organization’s director in shaping the manner in which the organization functions and creates it networks and how it approaches various watershed management actions.

Planning and policy networks. In Chapter 5, I described the formal and informal networks involved in watershed based planning activities in the Cuyahoga River. Here I discuss the insights of the governance actors on planning and policy networks (Note that I
didn’t explicitly ask the actors about networks while interviewing. During interview conversations, actors talked about the networks that they have created and a variety of initiatives and projects that they work on where they draw from their larger network of watershed organizations and actors).

The watershed action plan (WAP) process is one such planning initiative, which due to its technical nature and extensive data requirements, push watershed groups to draw from their larger network. A Port Authority official describes the WAPs as “very technical and math imperative” (Personal Communication, 2015). Thus, watershed groups that have worked on WAPs for their individual watersheds have depended on a larger network of actors to secure resources such as grant funding for doing the plan, water quality data, zoning code review and analysis. “CRWP has helped a lot of entities, and they have helped me in my Mill Creek Watershed Action Plan with code review and code analysis and I know they are helping the same with Big Creek” is an example a watershed partnership staff provided.

**Leadership – moving things in the “right” direction.** Leadership and direction provided by the watershed group directors was deemed as critical by several of the actors. They provided the example of the West Creek Conservancy’s (WCC) organizational direction and watershed work as an example of leadership that is attuned to changing scenarios and requirements and is able to adapt and shape the organization accordingly, while producing consistent watershed- (e.g. land use, habitat, water quality) and community-level (e.g. maintaining a volunteer base, municipality support, educational programs) outcomes. The organization – West Creek Preservation Committee – is a community resident-led, grassroots level watershed organization formed in the mid-1990s.
to preserve the existing undeveloped areas in Parma from development. The organization has been very effective in preservation of green areas, carrying out restoration and trail projects, and carrying out watershed scale planning efforts. Overtime the organization started to undertake the role of advisor to other watershed groups (e.g. Big Creek, Mill Creek) in a technical capacity and also in a collaborative capacity for developing watershed action plans. Further, the leaders in the organization responded to watershed management, and expanded the role of the organization. The director of the organization came in originally as an intern and has seen the group adapt and actively helped it evolve and move it to the right direction – adapting to and fulfilling the role of an urban land conservancy, a role that was important but largely unfulfilled in the Cuyahoga River watershed. A WCC staff member describes this change in the organizational mission and the trajectory of their work from a watershed partnership to an urban land conservancy as:

So it was around 2006-07, we started getting these requests from some other groups whether they are municipalities or watershed groups. At that time there wasn’t an entity willing to hold a land or capable of holding land within these urban environments. Holding urban land is very complicated; there is safety, security, maintenance, operations, insurance they all go into this. And not all land is going to be contiguous to the park like a city park or a metropark or any other contiguous park managed by a public entity. We took the, some people call it risk, and it is, a long term liability of owning land kind of scattered throughout, but in 50 years you start to see things come together, corridor piece together like a massive complicated puzzle. Even in the 19 years of West Creek’s work, you saw
the West Creek, but then you started to see these scattered pieces of green pop up on maps, and now you look at it, it is an almost contiguous corridor…Piecing together parcels and making it one contiguous corridor is time consuming, expensive, requires stubborn patience because these are not buying just the green spaces that are left over or residual, these are also reclaiming green spaces out of unsustainable development (Personal Communication, 2015).

The organization changed its name to better reflect its mission, and unique role as an urban land conservancy in Northeast Ohio. Having visionary leadership and understanding and adapting to change is a key aspect of watershed management, one that the WCC illustrates well.

For the longest time in the history of governance of the Cuyahoga River, the Cuyahoga County Port Authority (Port Authority) was averse to partnerships and collaborations. The Port Authority worked exclusively within its official authority as an agency in charge of facilitating uninterrupted shipping and navigation in the channel. A the new executive director led the agency to shift gears in their organizational responsibilities and goals. A Port Authority official describes the new director as “visionary” (Personal Communication, 2015).

When [the executive director] came to the port he was kind of surprised there wasn't more involvement by the port in the entire area tied to the core, not just the docks that we have on the lake, but our relationship to what gets shipped upriver. He was kind of stunned by that and so, he really felt there should have been and he invited me to give a tour one day … because he figured I was knowledgeable. I
gave him a tour and showed him all these issues and most of them he ended up writing into the Port’s new strategic plan (Personal Communication, 2015).

The new director gave the Port Authority’s goals a strategic refresh, and the agency worked on a new strategic plan that reflects a shift in the Port’s work towards more collaboration with regional agencies. The Port’s work has traditionally been geared towards economic vitality, waterfront renewal, and job creation. The new strategic plan represents the Port Authority’s shift to a new operating paradigm:

[T]hat recognizes the best way to strengthen the public trust is with well-grounded strategies, solid results, transparency and integrity, collaboration with partners, and a solid understanding of community priorities and economic realities (Personal Communication, 2015).

It is clear from such descriptions that leadership, visioning, and organizational and management decisions play a key role in effective governance.

New and Innovative Forms of Governance

The actors in the Cuyahoga River watershed created a networked form of governance, which was an overlay on the current policy implementation and institutional structure. This governance form has been very effective in leveraging grant funding, creating partnerships and collaborations, forging community networks, and bringing new ideas to watershed management, but limitations remain. A key limitation that several actors pointed out has been the ineffectiveness of watershed groups in successfully getting GLRI grants to carry on watershed projects. The presence of several small tributary watershed groups to the Cuyahoga River, although driven and extremely effective in their own watersheds, makes it difficult to address issues of scale. That is,
localized subwatershed impacts and improvements have not been scaled up adequately to the whole Cuyahoga River watershed. Also, to address some of the currently existing impairments in the Cuyahoga River main stem, one watershed group alone cannot leverage the amount of grant funding required to address the issues. Further downstream, in the Flats areas along the Cuyahoga River shipping channel, the presence of a traditional institutional form of governance was limiting the scope of management actions. A local elected leader explained to me how the Flats area wasn’t able to transform its functioning the way it should have, because the traditional institutional set up in the area had “artificially instigate[d] one sector over another” (Personal Communication, 2015). Prolonged single use of the navigational channel by the industrial and commercial sector had reduced the diversity and the related benefits that might accrue to the area.

Governance actors, through years of experience in watershed management and creating new governance and institutional structure for policy implementation, have proactively engaged in developing new and innovative governance mechanisms to overcome these limitations. Actors also realized the need to actively transform certain systems and regimes in place that, in spite of the networked governance functioning in the watershed and overall collaborative work environment, were hitting against the inherent limitations of an outdated institutional structure for governance, and limiting the potential of the overall watershed management.

Several actors that I interviewed spoke in detail about two particular initiatives namely, the Flats Forward Initiative and the Central Lake Erie Basin Collaborative. These governance forms are in different stages of functioning, one has been around for the past
3-4 years and the other has just been created. One is a decentralized, informal type of a process, while the other is more formally created but decentralized nonetheless. Actors talk about the shifts and transformations that each of these innovative forms of governance brought or are likely to bring to the overall governance of the watershed and the urban region.

**Flats Forward – advocating for the “first neighborhood.”** I described the settlement history, industrial and commercial use background, and the slow transformation of the Flats area into a thriving multi-use region in Chapter 5, and also briefly in the “Placemaking: Creating a Sense of Place and a Local Identity” section in this chapter. Here I describe how the institutional governance mechanism for the Flats area was transformed, with deliberate intention, to create a new and fundamentally different form of governance that has changed the overall functioning of the area. Several of the critical improvements in the Flats area and the “placemaking” and “revitalization” that we see in the area are a result of the change in the governance in the Flats.

Since the beginning of the industrial era in Cleveland in the nineteenth century, the Flats area in Cleveland has been dominated with industrial and commercial land uses. In terms of residential presence, a few areas of public housing have existed in the Flats. In the 1990s, the Flats area saw a brief period of development of an entertainment district with clubs, pubs, and restaurants operating in the area, but the area lacked the sectors and uses that makes up city neighborhoods. A local elected ward official describes the Flats area as it was:

In some ways it was considered to be too dirty or too dangerous that the only uses that would have been appropriate would have been alcohol establishments or
places like adult entertainment or where you build public housing. You know it is kind of almost like a human dumping ground [italicized for emphasis], with what society doesn’t consider being important. And yet those liquor establishments eventually closed because the homogeneity of the economics wasn’t successful. For a long time by and large public housing have been ignored and industry had been allowed to get off around it so you get to a place near Lakeview where it is not safe to walk because there is so much truck traffic. It is no irony that the health statistics in those communities are poor and we have created a situation that is untenable (Personal Communication, 2015).

Owing to the presence of a single significant industrial and commercial land use interest, zoning was not enforced and operated in what a retired CPC planner described as “anything went… zoning was ignored…it was almost considered as lawless” (Personal Communication, 2015). The institutional set up existing in the Flats was the Flats Oxbow Community Development Corporation (CDC). CDCs are non-profit community-based organizations. The main role of the CDCs is to revitalize typically low-come, underserved neighborhoods in cities that have faced significant disinvestments. CDC work is typically primarily centered on providing affordable housing, economic development, sanitation, neighborhood planning projects, and community education (Democracy Collaborative, 2017). Cleveland has a long history of various strong and powerful CDCs working in various inner city neighborhoods. CDCs in Cleveland, by their very constitution, history of work, and public investment (funded by the Mayor and the City Council in Cleveland) yield significant influence. There is also an explicit
validity, trust, respect, and support that CDCs get from the neighborhoods and communities that they serve.

It was the industrial stakeholders operating in the Flats that formed the Flats Oxbow CDC. A majority of the board of the CDC consisted of the members of the industrial and commercial community, and that influenced the mission of the organization and the management of the Flats, oriented to keeping the area industrial. The members of the Flats Oxbow CDC for years objected for years to the creation of new housing, recreational interests in the form of the extension of the Towpath Trail to Cleveland and rowing in the navigational channel:

Members of this old organization would come in and we would have new housing, to stop it. They fought all the new housing. They fought the Towpath Trail, they fought the rowers. They would come and say at different meetings that they didn’t want it. Rowers competed with the ships on the river; the bicyclists competed with the truck drivers. Housing meant that people would complain about the silt and the dirt and the truck traffic. And I got sick of fighting that (Personal Communication, 2015).

The local elected ward official clarified this point further:
My point is that the Flats Oxbow people were engaged in doing things that were not really good for the community. They seemed to be powerful and they seemed to have the community’s best interviews at heart but they were interested in sustaining a pure industrial world that didn’t take anybody else into account (Personal Communication, 2015).
It was clear to the local ward official that such a singular view and use of the river and the Flats was limited and unsustainable. He organized politically, backed up with community support to lobby the Mayor of Cleveland and City Council to defund the organization. Changing the direction of the governance was to change the framing – from single use to multiple uses – and to facilitate such uses of the Cuyahoga River and the Flats:

So when we started changing the direction of the neighborhood by not just making it a place where people did their industrial work but a place where people wanted to enjoy, they wanted to walk through, they wanted to run through, they wanted to row through (Personal Communication, 2015).

Therefore, the local ward leadership along with support from agencies such as CPC, embarked on an “intentional process” to move towards a completely different direction in terms of governance and looked for community support for their ideas. At the time, during the planning stages, the ward leadership didn’t anticipate the opportunities that the new governance form would open up. As a result of the legacy of the earlier CDC, which had sustained a non-participatory process of “community development,” the local ward actors focused on a ground-up democratic and collaborative process. A local elected official emphasized the democratic aspects of the governance transformation:

It happens in every neighborhood, just because you get rid of one group of elitists another group will come. And so to create an equitable environment there has to be an understanding of all voices matter and everyone has to understand that and you have to remind people of that (Personal Communication, 2015).
The Ward officials conducted public meetings, and received overwhelming participation and support from community members. People were excited to participate and contribute ideas towards the shaping of their community, because they had been intentionally left out of the earlier community development process. The local elected officials also talked with the residents that lived in the public housing, the rowers, bicyclists, commercial truck drivers, salt mine workers, industrial workers, restaurant owners, and other new businesses. Based on the inputs from the community members, and other area organizations and government agencies, Flats Forward was formed as a new non-profit CDC, representing interests from commercial, residential, recreational, industrial, maritime, and entertainment stakeholders. All of these sectors are part of the Flats Forward organizational board, and all organizations pay annual dues for membership in the organization. The very basic premise of operation of the organization is collaboration among various stakeholders and interest groups, and for the organization to provide coordination support to these collaborative activities. During board meetings people share information and stay updated about the activities that their individual organizations are doing, and also find overlapping areas of work where there can be opportunities for collaboration.

This manner of transforming the governance, a “dramatically, fundamentally alteration of the way business is done,” through intentional intervention emerged through two critical aspects of understanding among the key actors/political leadership (Personal Communication, 2015). First is the understanding that a place should be appreciated for what it is and accepting the interdependence of various uses and interests and leveraging that for planning and management. A local journalist described this as:
And it is the critical mistake that people make is thinking that the craziness, the chaos, the disorder, the complete diversity of uses in the Flats – are things that we want to control – its what makes people want to go there. When I go on those trails, and I hear the train and I hear those ships, and there is the Heron, and the trucks are going by, there are people living there. That is why people want to be there. They do not want to be in a gated community in some ex-urban complex of nausea where you feel like you are dying a little bit every day when you go there, on a land that used to be a farm, living in a McMansion and watching TV. The Flats is the opposite of that (Personal Communication, 2015).

Honoring the authenticity of a place and cultivating it further is a key part of transformation. Second, the elected officials recognized that building human capital is key for transformation. As a ward official puts it:

It is so funny because everybody thinks that the solution to our biggest problems are more money, more regulations, and more of the opposite of whatever it is and they are wrong, they are all wrong. The only solution is the cultivation and proliferation of human capital. You can recreate abandoned neighborhoods by developing the human capital (Personal Communication, 2015).

Providing forums for good communication is key in building such human capital so that people can assist each other’s work and collaborate. Circumstances change, but nurturing diversity and facilitating the participation and partnering between various groups to enhance human and social capacity is key to building capacity.

Central Lake Erie Basin Collaborative. The Central Lake Erie Basin Collaborative (CLEBC) is a governance innovation that has a more informal mechanism
to forge a regional strategy for watershed management. Many tributary or subwatersheds in the Cuyahoga Basin have their own watershed groups. These groups have formed over the past fifteen to twenty years, after managing nonpoint source pollution became a federal policy focus sparking regional watershed based efforts. In the initial stages of nonpoint source management, working on a watershed-to-watershed approach has been a good strategy in the Cuyahoga basin to garner community support at a subwatershed level. The watershed groups have been very effective in building community support base through public education and volunteer programs as well as through various watershed projects. But once the community support base is created, and the so-called “low hanging fruits” of watershed management have been addressed, long-term watershed governance presents several challenges.

Current challenges to watershed management include piecemeal availability of funding for watershed projects (e.g. RAP and BGP doesn’t have dedicated funding, different sources of funding for different projects under several different agencies, initiatives, and policies such as OEPA, ODNR, 319 watershed grants, GLRI funds, CZMA grants), the lack of longevity of programs (such as ODNR watershed coordinator grant program that supported watershed coordinators since 2001 but was discontinued in 2014), and the uncertainty in current and future sources, types, and nature of funding (subject to agency priorities such as the recent reprioritization of GLRI grants) present unique challenges. For resilient watershed governance, management activities need to be consistent, even with uncertainties and disturbances. The need to develop such a governance entity lead to the formation of the CLEBC. This regional collaborative is a way by which individual watershed groups in the greater Cleveland region (including the
Cuyahoga River watershed groups) and their key leadership are strategically modeling themselves as a unified regional watershed entity. This initiative demonstrates the ability of the governance actors to reconfigure and self-organize into a new governance entity in order for long-term persistence of watershed management in the face of uncertainties.

**Background.** For the Cuyahoga River, there isn’t a formal watershed partnership that represents the whole watershed. The CRR, by its very nature as the non-profit fiscal agent of the RAP, and the geographic and physical designation of the AOC, has been limited in its capacity to function as an organization for the complete watershed. Further, the lack of clarity about the future of RAP – post remedial action planning – and the inability of the RAP to secure adequate funding for watershed projects after GLRI was introduced in 2008, led the governance actors to start thinking beyond the confines of a policy-led collaborative, similar to what had emerged for the RAP. Further, the lack of implementation projects in the planning framework of the RAP put the Cuyahoga River watershed in a disadvantageous position when the GLRI program started in 2008 to provide dedicated funding to Great Lakes watershed restoration projects.

At an recent AOC conference in Ohio, a USEPA official managing the AOC program provided the example of Michigan Department of Environmental Quality (DEQ) and its readiness with implementation strategies for restoration projects for several watersheds. When the GLRI was introduced, the Michigan DEQ could immediately and successfully apply for the funding, as it was ready with implementation plans and was thus prioritized in receiving GLRI grants. For the Cuyahoga River watershed, a key watershed organizer and steward described:
Just have a watershed group in the Cuyahoga that has initiative to identify these problems and bring people together and bring their resources together to solve it. It's just conceptually much more direct and clear and more effective I think (Personal Communication, 2015).

The formation of the CLEBC started more informally at first and then once the idea started gaining traction, the key actors involved in creating this initiative adopted a more planned approach.

*Idea generation and planning.* Several directors of watershed partnerships (e.g. Chagrin River, West Creek, Doan Brook, Tinkers Creek, and Euclid Creek) in the greater Cleveland area regularly met informally. Their informal network relationship had already been created through their prior watershed work, which according to the directors was the most pivotal step, in spite of its informality. Actors shared what each watershed group does and what are their unique areas of expertise – sort of creating “an inventory map of expertise, personnel, equipment and supplies, specialty” (Personal Communication, 2015). To give the conversations more direction, actors brought in the Institute of Conservation Leadership to facilitate the discussions, which they called the “kitchen table groups” to signal the informality of the process.

*Scale and structure.* Once the idea gained traction, actors started looking at more structural collaboration – finding grants to hire coordinators, finding employees within participating organizations that can be shared by the overall collaborative, and finding gaps in service areas of individual watershed groups and ways to fill those gaps through projects and services. The group was named the Central Lake Erie Basin Collaborative (CLEBC) and the focus was on Central Lake Erie basin, with the entity serving as a
holding company of sorts, with one tax filing system, one organizational board, with subwatershed components. A watershed group director closely involved in this process explains:

They [tributary watershed partnerships] have their own support base – whether that is residential or municipal, local and regional partners, but between us, Chagrin [CRWP], and a couple of other partners we have really been driving a collaborative approach in central Lake Erie. In the Central Lake Erie we need to have an identity so that we can attract a lot of funding. We are missing out on a lot of finding here in the Cuyahoga and with the collaborative we have pulled in all the groups of the Central Lake Erie (Personal Communication, 2015).

The idea is to reduce redundancies and duplication of efforts in watershed management that arises due to the presence of many organizations, and create a governing structure that would bring more coordination, focus, and efficiency to watershed management. With this type of a structure, actors will be able to circumvent the restrictions of scale (individual groups and their service areas being very small) and institutional inflexibility (with the RAP structure), yet will have the tributary watershed groups a part of this larger collaborative. As local implementing committees actors will be able to continue maintaining relationships with watershed communities. A watershed group director described the working model of this collaborative:

[Y]ou need to start looking into not only the level of impact, which could be greater if we start to really collaborate and work on a regional grant or regional implementation, but also efficiencies in saving money or time. You are not going to decrease competitiveness but you are going to increase the efficiency of the
competitiveness. So the collaborative has gone from everybody working in silos, and do what we do, and informally talking to each other, to formally talking to each other and thinking about the bigger path forward, thinking about the ways to make better impact, thinking about using our regional partners in a more strategic sense (Personal Communication, 2015).

Too many groups have been competing for the same pool of resources and grants, which has reduced the efficiency of the grant programs. The funding agencies (governments and foundations) are also creating a push for more collaboration between groups for a scaled up central entity. A regional collaborative will have more ability to get bigger grants and agency attention.

Directed leadership has been a key aspect in the design of the CLEBC. Leadership has been key in not being mired down by an “excessively bureaucratic process” as the Cuyahoga River watershed. The leadership of watershed group directors had the vision and the ability to recognize the strengths and limitations and create a governance mechanism that would capitalize on the strengths (by using individual watershed leadership nodes) and fill in the gaps and limitations of the currently existing management framework. The CLEBG secured grant by the Gund Foundation to hire a full-time watershed project manager and to start the operations for the collaborative in 2016. The watershed manager is currently housed within the West Creek Conservancy offices.

Learning Experiences

A Port Authority official invited me to join the Port staff to tour the river from the mouth of the river where it joins Lake Erie to further upstream. The Port Authority
operates two boats – Flotsam and Jetsam – that they use to collect debris on the Cuyahoga River. I joined the Port Authority staff on one of their regular hauls upriver to harvest debris after a week of rain event. The boat went upstream all the way to the Arcelor Mittal Steel plant and further to the site of the 1969 fire. The Port Authority official, who has also been a watershed stewardship champion and has been associated with the management of the river for decades, described to me that he travels to this point of the river, the site of the 1969 fire as a “pilgrimage, and to remind myself that how far we have come” (personal conversation, 2015). According to him, the physical marker and act brings meaning to his work on the river. Following Figure 6.4 shows the site of the 1969 fire (actual photograph from a 1952 fire) and the site in 2015.

![Figure 6.4: Cuyahoga River fire 1969, photograph from 1952 fire (left) and the site of the fire now (right) (Sources: Michael Schwartz Library at Cleveland State University and Author, July 10, 2015)](image)

**Deeper understanding.** During the interviews, actors reflected on their practices, actions, and what they learned over years through their practice. Several of the anecdotes and stories that they shared revealed a pattern of deeper understanding, an almost ‘tacit knowledge’ that went beyond organizational policies, professional practice, policy implementation rules, and planning and management skills. Multiple actors also hold this
knowledge, which indicates that informal mechanisms of interacting and networking, and through the relationships that actors have built with each other over years they exchange their ‘tacit knowledge’ gained from practice and experience.

A Port Authority official that has worked on the Cuyahoga River for close to three decades in various official and stewardship capacities explained to me that from years of working on various projects and interacting with community watershed stewards, ecologists, hydrologists, urban foresters, national park rangers he learned that to manage a watershed thinking from the lens of organizations, policies and implementation, and management is not enough. What directed his work towards the later part of his career, and the manner in which that shaped governance, is his understanding that watershed work should be guided by understanding the water bodies and how they function:

Watersheds really create themselves by managing flow and energy of water as it moves downhill, so you have to respect that and I thought this is a far smarter way approach governance and land use, especially, in terms of elbow room for streams, protecting them … So, people get the idea of the value of elbow room for streams. The river isn't just the trough, it’s the shelf, the floodplain, the length, you know, straightening the stream makes it hold less water (Personal Communication, 2015).

A watershed group director echoed a similar understanding that she developed through her watershed work. According to the director, a critical element that she has learned about is that “water quality either improves or degrades, it never remains stationary, and that is an indicator that watershed work is a constant process.” This
knowledge, she further explains, directed her work, “so, we worked with some people in that watershed and talked and I think that was the first time we just really listened to people and listened to their concerns and became aware of their view[s]” (Personal Communication, 2015). Watershed management outlives the work of actors and managers, actions mandated under policies, and actions taken through programs.

It emerged from the interviews that most governance actors viewed policies and regulations as tangential to their work, which they saw as sustainable management of watersheds in a way that improves not just water quality goals and targets, but also access to the watershed resources and quality of life of the residents living in the region rather than as implementation of federal or state policies. Policies, as many described, were treated as leveraging mechanisms for project grants, and educational and training resources for capacity building. Describing the role of effective watershed managers, a Port Authority official says they “don’t navigate the water, they navigate red tape” (Personal Communication, 2015).

Agency staff also noted that compliance with regulations and enforcement is part of the work they do, and doesn’t define their work as watershed managers. Describing the work of local agency actors, an environmental lawyer and long-time watershed steward says:

[What you do when you are a bureaucrat is you follow certain technical rules about how you interpret and apply policies...Your job is to carry out that program and that policy and you defend that. So, from that point of view when you have people coming in from this agency and that agency and so on...There job is to defend and implement their policy. And to kind of fend off different forces which
may compromise that policy. So, you get a certain amount of tension and a certain amount of cooperation … When the US government tells us here is what we have to do people don't like that. They don't like the state government telling them. They like to do it locally (Personal Communication, 2015).

Policies are varied and administered by different government agencies, but the local agency officials, irrespective of their agencies, or the agencies that the policies originate from, have to carry out effective governance at the local level. According to a watershed steward who trained as an environmental lawyer:

[T]here are policies that come in from a number of different sources, which aren't necessarily coordinated. People who implement the policy to the extent that they have some sort of a broader vision sort of try to coordinate … So, you know, policy does not translate directly into action by any way, shape, or form. (Personal Communication, 2015).

Thus, the street level bureaucrats and the actors that handle the implementation of policy at the very ground level have learned to stay true to the broader vision of governance. I also heard from several actors that over the course of their careers, they have understood that their actions are influenced by how they interpret policies and there isn’t a one-to-one relationship between policy and action. The area or processes in between are shaped by actors’ interpretation, experiences, intentions, and decisions.

**Doing more with less.** Another learning experience that resonated across watershed actors, evident through varying stories and examples shared during interview conversations, was the view that actors had to be ingenious in doing more with less. One aspect of this practice is the coordination of activities to save duplication of efforts.
Networking plays a key role in this. Even though smaller watershed groups each have their own support base built from educational and community programs, coordinating programs and merging resources for programs and activities lets the groups achieve more outcomes with the same amount of resources from each group. One watershed group director described coordinating on the areas where duplication of efforts is happening, in watershed educational programs in subwatersheds as hitting the “low hanging fruit.” Building further on this narrative the watershed group director described that this process lead him and others working with him to understand the value of collaboration, and the importance of having smart competition that doesn’t preclude collaboration:

So all these regional events started telling us the value of collaborative events …

So you have all those partners, and all these watershed groups, and all the stakeholders so that is a big animal to deal with [italicized for emphasis], but if you can increase effectiveness of implementation based on strategic competition we are ought to make leaps and bounds (Personal Communication, 2015).

Several actors emphasized that even the people that fought collaboration earlier are admittedly realizing the co-benefits of collaborating.

“People harder to change than policy.” Creating awareness through education is an area of focus for all watershed partnerships/groups. Watershed actors agree that even though education and stewardship activities are important, learning what and how to integrate in the educational programs has been a key aspect of management. Having individual tributary watershed educational programs, without an overall coordinated regional “message” would lead to what a watershed steward describes as:
It is like a metaphor of having a bunch of people pulling in the oars of a boat where they are all pulling at different times and they all have their own ideas about which way the boat should go. What happens is the boat just sits in the water and kind of spins around in circles (Personal Communication, 2015).

Individual watersheds still struggle with “turf issues” in terms of land use zoning and management. A watershed group director gave me the example of how different watershed organizations orientated their “community messaging” around drinking water – people care about the source of their drinking water:

They are not going to make changes on their property unless they have an adverse impact. But every benefit that they could make happen, they were relating it to drinking water. They were not relating it to the end of the street where the culvert dropped out but they were relating it to drinking water and recreating. It is our biggest asset and in terms of changing people’s behavior based on that we need to show them the big picture, so when you are turning in your faucet, you are drinking Lake Erie … People are harder to change than policy … People hate the regionalism word but sometimes we need a little of it because we can act locally, but we need to make sure that we are regionally considering the implications (Personal Communication, 2015).

Lastly, a key understanding that several actors built through years of watershed governance work is that there needs to be newer and better governance mechanisms and forms so that there is persistence and longevity to watershed work across agency and organizational programs and actions. In the absence of flexibility and adaptability in the
formal institutional and policy implementation structure, this type of initiative and design mechanism is more informal and emergent. The Central Lake Erie Basin Collaborative described previously is such an attempt.

**Summary and Implications**

In this chapter I presented the interpretations that I derived out of the governance actors’ narratives of experiences and meaning making activity of their practice of governance. Exploring their experiences and meaning making activity using a phenomenological inquiry revealed learnings, reflections, and deeper understanding among actors regarding their practices, knowledge, decision-making, intentions, and actions. In their narratives the actors revealed how through deliberate human intention, which is the critical aspect of adaptive governance (that helps in building evolutionary resilience), they have been able to transform the governance of the Cuyahoga River watershed, built capacity to adapt to future changes, and self-organized into newer and innovative forms of governance. Further, the metaphors that the actors use in their narratives not only have a descriptive character – describing organizational and policy practices – but also acquire a prescriptive aspect, which are the possible suggested actions in response to management situations (Yanow, 2000). I analyzed of the metaphorical language used by the actors, which shed light on the dominating versus emergent governance practices and make visible the critical ideas that were transformational (Table 6.1 below). Table 6.2 summarizes the broad themes that I presented in this chapter, the meaning categories emerging from the narratives of the governance actors under each theme, and statements from the interviews that illustrate the emergent meanings.
Table 6.1: Understanding transformations through metaphors

<table>
<thead>
<tr>
<th>Theme</th>
<th>Meaning Categories</th>
<th>Illustrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceptions about the river</td>
<td>Recreational connection</td>
<td>“There was an attitude about rivers at that time that made people...it was very easy to mistreat the river because everybody else did. “</td>
</tr>
<tr>
<td></td>
<td>Personal experiences shaping practice</td>
<td>“...with my understanding of the urban history of Cleveland as a city that grows up around the river and the historic...So I thought that by bringing people down into the valley...we would have a greater appreciation for the history, we would have an impetus for urban revitalization”</td>
</tr>
<tr>
<td>Creating a Sense of Place and a Local Identity</td>
<td>Reclaiming the valley</td>
<td>“…I think the best cities and the best places in the best cities are very comfortable with their origin stories”</td>
</tr>
<tr>
<td></td>
<td>Making communities and geographies</td>
<td>“The valley was always some place to cross, so we tried to make it a destination. “</td>
</tr>
<tr>
<td></td>
<td>Leveraging the “messy vitality” of the river</td>
<td>“I made the statement to the Akron Beacon Journal that the Cuyahoga River is a river that had no friends, and I did that purposely. “</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Now people can fish and row, they can’t swim, but they can do these other things. We are doing water taxi”</td>
</tr>
<tr>
<td>Governance, Policies, and Organizational Roles</td>
<td>Design and adoption of biological standards</td>
<td>“Because we do the biology, we have the better ability to do things holistically, at a much better level because we are asking the streams to tell us how it is. “</td>
</tr>
<tr>
<td></td>
<td>Maintaining institutional memory through organizational culture</td>
<td>“They handed it off to me because they have retired and there are other folks working with me that I am trying to hand off “</td>
</tr>
<tr>
<td></td>
<td>Community relationships and partnerships</td>
<td>“…people will call me up and we will go to evening meetings, Saturday workshops, training people, we do all that “</td>
</tr>
<tr>
<td></td>
<td>Organizational practice and innovation</td>
<td>“Is that if you do your work, you can have ‘play time’ “</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“…but they have always allowed us to work on the edges [of bureaucracy] and interact”</td>
</tr>
<tr>
<td>Land Use Zoning and Watershed Management</td>
<td>Encouraging good land use practice</td>
<td>“…so getting the towpath built. But it was really much more than that. It was about providing good land-use practice. “</td>
</tr>
</tbody>
</table>

Table 6.2: Summary of themes and emergent meanings from the interviews
Table 6.2: continued

Analysis from the interviews reveals that each of the emergent meaning categories portrays a sense making activity that depicts what happened within the governance processes. In the first theme of actors’ perceptions about the river, the descriptions show that the personal and recreational connections, experiencing the river first hand (including pollution, lack of aesthetics and access, and the eventful improvement in water quality and access opportunities) strongly shaped actor’s governance actions. A key aspect of perceptions shaping practice is that first-hand experience and connections with the resource helped actors understand the intrinsic value of the river – that is, the resource has value on its own, rather than the result of provision of functions or service for humans – and this influenced their governance practice such as
active involvement in projects such as creating fish habitat in the shipping channel portion of the Cuyahoga and understanding policies and regulations and liaising between communities and government agency officials to undertake watershed projects based on community inputs.

A key transformation that the actors from various communities of practice facilitated was the changing in the narrative associated with the Cuyahoga River. Uncovering the metaphors in the language used by the governance actors revealed the structure of their arguments (Yanow, 2000). Actors used the metaphor of “controlled chaos” rather than “controlling the craziness, chaos, and disorder” associated with the uses of the river. This signaled the creation of a shift in the manner in which the river is perceived. Confronting commonly accepted interpretations of events, places, people, and culture play a key role in deepening our knowledge regarding the world around them. Reframing agreed-upon knowing aids in finding gaps in current understandings and uncovers potential pathways and strategies in recognizing what could be different (Schneekloth & Shibley, 2005). Addressing several aspects of river management did this, ranging from bringing community attention to the river (via various media outlets), designing programs and initiatives to facilitate public access and raise public awareness about the resource (e.g. the Towpath Trail), and designing a new governance mechanism (the Flats Forward) to leverage the inherent vitality of the river. The single narrative of an “industrial valley and an impaired river” had stagnated restoration and revitalization efforts for decades. Deliberate shaping of a narrative of the river as a community resource and asset changed the way management has been carried out.
Managing change and dealing with rigid institutions that are resistant to change through informal networks, bridging to different knowledge systems, and creating an effective learning environment are key aspects of adaptive governance (Folke et al., 2005). This is evident in the networked governance that operates in the Cuyahoga River watershed. The networks or relationships that actors have created over time serve as a repository of ideas, knowledge, and practices that actors draw from, depending on the circumstances under which they are operating. For example, the informal watershed planning networks exhibit the capacity to organize outside of a formally mandated watershed planning process to increase the effectiveness of the watershed planning process itself. The watershed groups in the Cuyahoga Valley act as a bridge between community members and municipalities and the government agencies, and in spite of being a government agency, the Ohio EPA NEDO acts as an effective bridge between communities in its jurisdictions and other agencies as well as Ohio EPA headquarters in Columbus. As a unique bridge between communities and agencies, the Ohio EPA NEDO office is able to shape programs and implementation activity based on technical knowledge that it draws from other agencies and incorporate local knowledge in adapting its policy implementation and watershed management strategies.

Further, embedding the knowledge to innovatively and flexibly deal with disturbances and challenges in the culture of organizations and management requires, on the part of agencies, identification of management practices that survive change and refers to flexibility and diversification on the part of agencies (Folke et al., 2005). A shift in the metaphor regarding agency role from “adversarial – typical way in which agency regulates” to a “loose collective – a growing thick skin holds it together” demonstrates
the Ohio EPA’s organizational approach and policies towards collaborative watershed management. Cultivating community and informal relationships with watershed groups had helped the Ohio EPA NEDO to increase their effectiveness as a government agency in implementing policies such as the TMDL, but working with the communities the agency was also building key social capital based on relationship and trust. Rather than this practice changing with change in leadership at the agency, the NEDO officials found a novel way to maintain institutional memory and culture about the importance of cultivating relationships. They did this by adopting an intentional hiring process and a mentoring program where existing officials train new hires so that there is no knowledge vacuum. The West Creek Conservancy demonstrated organizational innovation and flexibility by self-organizing into an urban land conservancy from a watershed partnership, uniquely responding to social-ecological and management needs of the watershed, and knowledge needs of the greater networked governance of actors.

Flexibility in organizational practices and policies is a key aspect of adaptive governance in a manner that allows for learning in various ways to respond to change, and strengthens the capacity to manage resilience (Folke et al., 2005; Lebel et al., 2006). On the Cuyahoga River, this ranged from flexibility in organizational practices within the constraints of organizational operational guidelines such as the Sewer District broadly interpreting its role as a “Clean Water Agency” to creating regional capacity in watershed management, to changing organizational policies as done by the Port Authority to explicitly include collaboration with regional agencies and community based organizations to manage the lower watershed and fulfill its mission as an economic development agency, to creating flexible community-based systems of resource
management such as the CLEBC that is supported by and works with various organizations at different levels.

Innes and Booher (2010), quoting Friedrich Nietzsche, argue that institutions resist change, even when ideas and beliefs have – “The overthrow of beliefs is not immediately followed by the overthrow of institutions; rather the new beliefs live for a long-time in the now desolate and eerie house of their predecessors, which they themselves preserve, because of the housing shortage” (p. 196). Actors have to make do with old institutions; therefore, they find innovative and new ways of and forms of governance arrangements that mesh better with the change in beliefs and ideas. Also, in the early stages of transformation or design of a new governance arrangement or initiative, decentralized and informal processes are more effective in catalyzing action, as these processes are more flexible. Formal methods become more relevant and effective in the later stages of transformation. I discussed here exemplars of both processes.

The CLEBC is an informal and decentralized approach to watershed governance, where organizations and agencies have created a loose collective to create healthy environment of “coo-petition.” Understanding the watershed metaphorically as a “massive complicated puzzle,” watershed actors (instead of the singular view of industrial and commercial usage), influenced self-organizing actions in the form of creation of the CLEBG that would operate at a regional scale, focusing on the complete puzzle of the watershed, rather than pieces of it through the work of individual watershed groups. The creation of this governance form was a response to several of the shortcomings of the current governance, and was designated to leverage the benefits of working at the scale of a region rather than individual subwatersheds, which was itself
experiential knowledge that had emerged from practice. The Flats Forward organization and governance entity is on the other hand a formal organization that derives its authority and legitimacy from being a CDC. The manner in which this governance initiative was designed was very intentional, based on a set of ideas that were derived out of community and stakeholder input, stemming out of the metaphor of a “call for a more democratic process,” used by the architect of this initiative. Creating an equitable and participatory initiative based on diversity of stakeholders and multiplicity of use of the Cuyahoga River was the driving force behind the design of the governance initiative. This was a significantly different approach than what had been the dominant way of governing the lower Cuyahoga River watershed since the beginning of the industrial era.

One of the key aspects of shifts in governance that was revealed through the interviews was the reflective activities and discussions that governance actors are involved in through their informal watershed networks. Actors regularly discuss and exchange ideas on their strategies, decisions, shortcoming, and gaps in services provided by their organizations. Further the phenomenological nature of the interview led the actors to reflect on several of their practices, actions, and understandings, which revealed ontological shifts in the manner in which roles of the government agencies and watershed-based organizations are construed and relationships of trust and respect are forged. Metaphorically, talking about the agency role as “walk on the edges and interact” instead of “linear,” reveals this ontological shift. In terms of forging watershed networks of relationships, trust, resources, and knowledge, actors describe a shift in their approach by using the metaphor of “talking to all” instead of just “talking to friends.” Thus, participants could develop an intersubjective understanding of themselves and be
mutually understood. The collaborative capacity of local actors to collaborate on very complex policy strategies and their implementation appears to have been increased due to the development of a common understanding of the resource. The emergent networked governance on the Cuyahoga has served to couple the vertical government responsibilities (local, state and federal) to horizontal systems at the local and regional level, enhancing the capacity of the government actors to achieve their missions more effectively, and providing access to knowledge and influence of local stakeholders.
CHAPTER VII

EMERGENT THEORY: HERMENEUTICS IN WATERSHED GOVERNANCE

Planning is addictive. Through planning we can control things from beginning to end in a rational, linear fashion. Implementation is hard, it takes creativity, and patience, and breaking out of a rational thinking mode (Russ Gibson, Ohio EPA).

The overthrow of beliefs is not immediately followed by the overthrow of institutions; rather the new beliefs live for a long time in the now desolate and eerie house of their predecessors, which they themselves preserve, because of the housing shortage (Friedrich Nietzsche via Innes and Booher, 2010).

Governance in the Present Day

These quotations describe the changing nature of ‘mood’ in governance. This change was in response to limits of rational thinking in policy and bureaucratic institutions, wicked environmental and urban issues, and limitations of expert knowledge leading the way for more inclusive and diverse sources of knowledge in policy and public processes. This shift in mood opened up space to think about human societies, how they are held together by a shared culture that is enacted and shaped through networks, and
what that implies for self-organization of governance and institutions and the practice of governance (Ernstson et al., 2010; Wilkinson et al., 2010).

The vocabulary of “governance” emerged over the past three decades. Governance marked a shift away from ‘set solutions’ implemented through top down government and formal political institutions to a notion of politics that brings in new sites, actors, and views. Societies are complex and values in policy and administration are multiple, fluid, and controversial (Dryzek, 1993). These transformations, are gradually changing the political systems from hierarchical and unitary systems of government governed by laws, rules, and order, to relatively horizontally organized systems of governance that rely on self-regulating networks (Sørensen, 2002). Networked governance is well suited to dealing with complex problems, as it accords freedom to its actors from a rule-driven process. Further, “state or local governments and their nongovernmental partners are better able to discern and accommodate the diverse preferences, values, and needs among citizens and to also facilitate new channels for citizen participation” (Heinrich, Lynn, & Milward, 2009, p. i7).

Over the past two decades or so, scholars in the public administration and policy communities have challenged the traditional notion of policy (described in chapters two and three) based on rational decision-making (Bogason, Kensen, & Miller, 2004). Public policy processes and systems are complex in nature and are characterized by multiple kinds of interactions between the constituent elements (such as governmental and/or non-governmental actors, different rules governing various types of organizations) and lack of full information regarding the policy issue (Morçöl, 2012). What policy relevant actors do in such situations is “muddle through.” This is characteristic of everyday policy and
situational policymaking whereby actors (politicians, interest organizations, administrative agencies) “enter into a process of negotiation where the necessity is to reach accommodation rather than to fulfill a singular, overarching political goal” (Bogason et al., 2004, p. 3).

Nowhere is this ‘muddling through’ activity more evident than in a complex urban resource context of the Cuyahoga River watershed in Northeastern Ohio. The watershed is governed by a constellation of laws and regulations implemented through a highly formal institutional structure. Within this structure, local actors collectively, and often informally, construct and interpret meaning of the policies through the process of dialogue and deliberation. The resultant collaborations are not the traditional designated hierarchies of structured behaviors and roles, but are instead emergent and based on practices to achieve shared goals. Since meaning “is somehow constitutive of political actions, governing institutions, and public policies” (Wagenaar, 2011; p. 4) an interpretive approach focuses on the meanings of policies and the values, beliefs, and feelings of the political or governance actors (Yanow, 1996). In addition, dialogues and interactions among the actors in an entire network of communicating individuals and organization bring meaning to the governance processes (Westley, 1995). Overtime the deliberation and meaning-making by the actors creates a shared understanding and shapes the governance of the resource.

Given this background, this chapter discusses governance in the Cuyahoga River watershed using an interpretive approach based on a hermeneutic tradition. The chapter contributes to this tradition by extending it to the vocabulary of governance. While I started with the original framework of understanding networked governance in the
Cuyahoga River watershed through Gadamer’s hermeneutic concepts of tradition, authority, and prejudice, what evolved in the process of conducting this study and analyzing the data generated is that these concepts can be used not just to understand the governance in the Cuyahoga, but also the overall water pollution control and management policy eras in the United States. What is revealed is through a hermeneutic understanding is that the ontological shift in the evolution and subsequent transformation of governance of the Cuyahoga river is intricately interwoven with that of the overall water policy milieu.

Further, Gadamer’s hermeneutic concepts of tradition, authority, and prejudice and the role of dialogue provides a lens to understand what it means to the actors to be a part of a governance network. This chapter also explores interpretively the hermeneutic space that is created through the interactions among actors, which shapes and re-shapes the relationship between tradition, authority, and prejudice overtime.

**Research Questions and Analysis Method**

The overall question that guides this chapter is: How do governance actors relate to each other and how does that shape and/or transform governance? Specifically, this chapter answers the third research question - Why is it important to understand meanings to understand governance? Why do the various actors and stakeholders come together? How do they bind policy meanings and experience meaningful inclusion through participating in governance?

The main objective of interpretive research is to understand the “meaning-making activity of human actors” (Yanow & Shwartz-Shea, 2006; p. xii). Phenomenology in general, and hermeneutics in particular, is a form of inquiry that is associated with
interpretive practice (Denzin & Lincoln, 1998). Phenomenological research is concerned with experiential meanings and a fresh, concrete, and rich description of a phenomenon as is lived or experienced by people (Finlay, 2009). Within hermeneutical philosophy, interpreting meanings generated by human beings, either individually and/or collectively, is key. Meaning of a phenomenological description lies in its interpretation, which is not an additional procedure. Scholars argue that it is by the virtue of our very being-in-the-world (Finlay, 2009).

In this chapter the results that are presented are drawn mainly from the in-depth interviews conducted using an interpretive phenomenological analysis (IPA). IPA allows an in-depth exploration of the interpretation of the meanings that actors associate with their practices and actions involved in the governance of watershed and how this experience transformed the overall governance. The structuring of the results and analysis as well as the connections with the theoretical framework is also derived from the observations carried out in the field. I describe analysis of the interviews here, as the results are mainly drawn from the interviews, but in an interpretive study all methods of data generation and analysis are integrally connected, and hence the results and discussion doesn’t arise from any single method.

Eighteen in-depth interviews were carried out over 2014-15. Interview participants were selected based on personal contacts, from opportunities that arose during observation process, and snowballed to include other individuals through a system of referral gathered during interviews and observations (Smith et al., 2009). The interviews explored in-depth the interpretation of the meanings that actors associate with their work on the management of the watershed. The interviews lasted 90 - 120 minutes.
Some interviews lasted for several more minutes owing to the interest and the willingness of the participants. The interviews were recorded and transcribed in full.

The interviews were conducted and analyzed using an IPA strategy, ensuring that the focus is on “people’s experiences and/or understandings of particular phenomena” (Smith et al., 2009, p. 46). The data from the interviews was first analyzed to identify emergent patterns or themes (Smith et al., 2009), which were then put back together in a way that represented actors’ meanings (Luton, 2010). Since the purpose of interpretive research is not to generalize from the data, but to find meanings from it, analysis in IPA research is always subjective and themes represent meaning units (Smith et al., 2009). The themes derived from the analysis of data for this research were then connected back to the theoretical framework.

The steps involved in IPA analysis that were used to analyze the data collected through interviews, drawn from Smith et al. (2009), are following:

*Step 1* – immersing oneself in the original data and reading and re-reading the data to familiarize oneself with the data constitutes the first step in IPA analysis. This step also involves recoding some of the most powerful recollections of the interview experience and noting down the initial and most striking observations from the interview transcripts. I also highlighted the contradictions and paradoxes (if any) emerging from the ‘life stories’ and ‘narratives’ of the participants. This step overlapped with the interpretive analysis that I conducted to arrive at the meaning structures emerging from the interview narratives in the previous chapter.

*Step 2* – is in many ways the initial level of analysis and involves examining the content of the interviews at an exploratory level. Steps 1 and 2 merged, as I started
writing down exploratory notes and comments of my initial observations. The aim of this step is to produce a detailed set of notes and comments on the interview data. The descriptive core comments here have a phenomenological focus, staying close to the participants’ explicit meaning. I also focused on the language that the participants used in order to understand their context and identify more abstract concepts that were helpful in making sense of their meanings. Drawing links and connections between various exploratory comments are critical in understanding participants’ world and engaging in deep data analysis. This process of engaging with the data moved from exploratory comments to writing descriptive content, focusing on language, and finally moving to more interpretive-level conceptual comments. In this step, I also identified quotations and statements by the participants that I present in this chapter.

Step 3 – involves developing emergent themes from the data after it has grown substantially through exploratory commenting. Drawing emergent themes entails mapping interrelationships, connections and patterns across exploratory notes. I drew the themes in a manner that they reflected the participants’ original words and thoughts, but also included my interpretation of their stories and ideas.

Step 4 – searching for connections across emergent themes is the next step, and involves the charting or mapping of the themes in a manner that they fit together, based on the theoretically-informed hunches and overall conceptual organization of the study. This process is also called abstraction, where patterns are identified between emergent themes into a sort of ‘super-ordinate’ theme. I organized the emergent themes in a manner and structure where they pointed to the most interesting and important aspects of practice of governance.
Step 5 – the next step involves moving to other interview transcripts and repeating the same process. Since IPA interviews are in-depth and descriptive, each interview is treated as a participants’ ‘story’ and an individual case. Treating each case individually, in its own terms, also involves bracketing the ideas emerging from the previous cases while working on the subsequent cases. This allowed newer themes to emerge with each case.

Step 6 – the last stage involves identifying patterns across cases (interviews). This step involves comparing, reconfiguring, and even relabeling of themes. This is the more theoretical part of the analysis, which involves moving from abstract or super-ordinate themes of individual cases to higher order concepts that the cases share. In other words “pointing to ways in which participants represent unique idiosyncratic instances, but also shared higher order qualities” (Smith et al., 2009, p. 101).

I use a broad grounded theory approach to develop theoretical insights from the analysis of data and the insights derived from it to generate a theoretical framework. A grounded theory approach helped me to tie the insights derived from the analysis and move the thick analysis towards theory development (Charmaz, 2006). Unlike pure understanding of grounded theory, I want to clarify that based on an interpretive understand as espoused by this research, I practiced interpretive grounded theory, that is – “construct [original emphasis] our grounded theories through our past and present involvements and interactions with people, perspectives, and research practices” (Charmaz, 2006, p. 10). This means bringing a priori understanding of the preliminary ideas to the analysis of data and development of the theoretical framework. However, in order to differentiate interpreting data from imposing a preexisting frame upon it, it
should be acknowledged that preconceptions play a role in data generation and analysis from the very beginning in an iterative, dialogical process. Thus, data is shaped by analysis and analysis is shaped by data continually (Travaline, 2012). In the following sections, I first present the emergent theoretical framework on understanding transformation in governance. I then apply this theoretical framework to the case study of the Cuyahoga River watershed. I end the chapter with the implications of using a hermeneutic framework for studying governance.

**Emergent Theoretical Framework**

Heidegger’s philosophy is based on an existential-ontological conception of hermeneutics, mainly emerging from his concept of *Dasein* (being there). Heidegger states that “understanding” is a fundamental category of human existence. Extending this, Gadamer developed a systematic philosophy of hermeneutics arguing that hermeneutics means placing interpretation in the context of one’s own social-historical existence. This hermeneutical approach to history, political activity, and generally to the human sciences as a whole refers to a theory of understanding and is especially relevant to the understanding of governance and policy (Gadamer, 2004; Bevir & Rhodes, 2003).

For the study of policy implementation hermeneutics is at play at two levels: a) understanding what the governance actors do and how they make sense of policy in the process of governance (Yanow, 2000); and b) the author’s/interpreter’s attempt to develop an understanding of the meaning of governance using Gadamer’s concepts of *prejudice* (as ‘conditions of understanding’), *authority*, and *tradition* (Gadamer, 2004, p. 278).
Prejudice, Authority, and Tradition

Gadamer asserts that man is a historical being and an inevitable part of that being is his situatedness within traditions (Simms, 2015). Gadamer rehabilitates the concept of prejudice, and in presenting prejudice as ‘fore-structure of understanding’, also argues that the concepts of authority and tradition (as they relate to prejudice) also need to be rehabilitated (Gadamer, 2004). Simms (2015) summarizes these concepts as:

*Prejudice* is ‘a judgment that is rendered before all elements that determine a situation have been fully examined’. Gadamer rehabilitates prejudice by distinguishing between legitimate and illegitimate prejudices. A legitimate prejudice is one founded on authority, since authority is usually derived from the greater experience of the person holding it… (p. 89).

Gadamer emphasizes the explication of prejudice as human knowledge. All knowledge is subject to prejudice. Gadamer’s main argument is that by virtue of our historical consciousness we have pre-judgments; these pre-reflective involvements with the world stand behind our judgment and make reasoning possible, (Lawn, 2006; van Manen, 2014). The key task of hermeneutics, Gadamer’s insists, is not to get rid of one’s prejudices, but to bring them out in the open so that they do not become an obstruction in the path of understanding. This would mean not sticking blindly to one’s own prejudices, but being aware of them, and also being open to the meaning of the other person (Gadamer, 2004; Simms, 2015). Within governance, hermeneutics opens up space for varying perspectives and dialogue by enlarging the scope of actors involved and bringing people together from a large array of different backgrounds and often of different
expertise, and social and political orientation. Prejudice also plays a key role in rehabilitating the concepts of authority and tradition, as they are commonly understood.

Gadamer (2004) asks, “what distinguishes legitimate prejudices from the countless others which it is the undeniable task of critical reason to overcome” (p. 278)? Authority, if it displaces one’s own judgements and results in not using one’s reason at all, then becomes a source of illegitimate prejudices. This form of authority is commonly associated in social life with power, domination, and blind obedience. Gadamer defines authority in terms of ‘genuine authority’ that has its own legitimacy based on the acknowledgement of knowledge (Simms, 2015). “Authority… properly understood, has nothing to do with blind obedience to commands. Indeed authority has to do not with obedience but with knowledge” (Gadamer, 2004, p. 281). Further, authority that a person “derives from his office is not based on the hierarchy [that makes it possible to command], but [knowledge] is what makes it possible” (Gadamer, 2004, p. 281). Although knowledge is vested in individuals, the source of authority is knowledge (Lawn, 2006; van Manen, 2014). Thus, according to Gadamer the prejudice that is involved when authority (as Gadamer describes) is accepted is in favor of not just the person, but of the knowledge embodied by the person.

Gadamer (2004) asserts, “the prejudices of the individual, far more than his judgements, constitute historical reality of his being” (p. 278). To overcome this prejudice, one must recognize that tradition doesn’t need to persist because of inertia of what once existed; rather, “it needs to be affirmed, embraced, and cultivated” (Gadamer, 2004, p. 282). Tradition, in the original and conventional sense of the word, means to hand on, pass on, or transmit something from generation to generation. Gadamer offers a
different interpretation of tradition. The skills and craft that are passed on from
generations to generation are not simply repeated, but are constantly being changed and
modified, reworked and reinterpreted. Shils (1981) articulates this notion of tradition as:

Constellations of symbols, clusters of images, are received and modified. They
change in the process of transmission as interpretations are made of the tradition
presented; they change also while they are in the possession of their recipients.
This chain of transmitted variants is also called a tradition… (p. 13)

Rather than distancing or freeing ourselves from tradition, hermeneutics lets us be
cognizant of our historical judgment, and makes us conscious of the prejudices governing
our own understanding, and helps in bringing them to the foreground (‘foregrounding’).
Gadamer’s conception of prejudice, authority, and tradition show that method or rules
cannot control human understanding and that all human understanding is interpretation
and occurs through dialogue (Lawn, 2006).

Understanding Transformation in Governance

Context of Governance and Horizon of Understanding

Governance processes change and transform overtime. Recognizing the change in
prejudice, authority, and tradition is key to gain an interpretive understanding
transformation in governance. The conceptual framework presents the relationship
between various hermeneutic concepts and elements that are involved in the creation of
an interpretive framework to understand the change or transformation in governance (see
Figure 7.1). Bevir & Rhodes (2003) examine the manner in which individuals create,
sustain, and modify social life, institutions, and policies. Considering social contexts as
traditions, Bevir & Rhodes (2003) argue that, “tradition allows for the possibility of subjects adapting, developing and even rejecting much of their heritage” (p. 32). In other words, because a subject is born into a tradition doesn't mean that they cannot change it. Individuals are born into a social context, which acts as a background to their beliefs and actions (Bevir & Rhodes, 2003). Much like Gadamer’s (2004) assertion that tradition ‘combines with the new to create new value’ (p. 283), Bevir & Rhodes (2003) assert that “we always confront slightly novel circumstances in which we need to apply tradition anew…traditions are not fixed entities” (p. 33).

The hermeneutic notion of situatedness of human beings lends itself to the fact that knowledge can never be complete. Horizon provides a vantage point to look at an issue, but having a horizon also implies having ability see beyond it. Finding the right horizon of inquiry into a subject or an interpretation would mean encountering tradition and opening up horizons of understanding (Simms, 2015). “The horizon is … something into which we move and which moves with us … The horizon of the past, out of which all human life lives and which exists in the form of tradition, is always in motion” (Gadamer, 2004, p. 303). This expansion (or movement) of horizon of understanding leads to testing of our prejudices by encountering our past and our tradition (Simms, 2015).

Thus, the situatedness of human beings, their meanings, and practices are key to understanding governance. Further, “governance is not any givens set of characteristics. It is the stories people use to construct, convey, and explain traditions, dilemmas, beliefs, and practices” (Bevir & Rhodes, 2011, p. 212). Thus, the horizon of understanding and the context provided by the governance explains change [in traditions] that occurs
through dialogue, and in response to dilemmas (see Figure 7.1). The findings of this study demonstrate that this change in tradition shapes and re-shapes the concepts of authority and prejudice by actors involved in the governance of the Cuyahoga River

**Figure 7.1: Hermeneutics and transformation in governance**

**Dialogue and Dilemma**

Gadamer asserts “understanding is always part of a dialogue, hence, is dialogical in nature” (Lawn, 2006, p. 70). Linking dialogue to truth and authority, Gadamer argues that genuine authority provides the conditions for the emergence of truth. Whatever truth might be, it can only emerge through dialogue. Lack of structure and incompleteness are basic aspects associated with genuine dialogue. “What emerges in its truth is the logos, which is neither mine nor yours and hence so far transcends the interlocutors’ subjective opinions” (Gadamer, 2004 p. 368). The true essence of hermeneutic dialogue is where
mutual understanding is reached between two partners through a conversation (Simms, 2015). According to Gadamer:

In the genuine dialogue the participants change as initial assumptions are challenged, modified, held up to scrutiny in the public court of appeal, in the dialogue itself…Prejudices can arise to the fore in dialogue as they are frequently challenged and surprised in dialogical encounters (Lawn, 2006, p. 71).

The interactions and dialogue that takes place between actors, as they go about their everyday actions, struggles, and negotiations in the process of administration and management, enables them to understand one another. The purpose of this shared understanding is not to reach an agreement, but to understand perspectives of other actors. Coming together by participants in a dialogue is not just a precondition of hermeneutics, but also that of politics and governance. Therefore, governance networks (be it participatory, deliberative, or collaborative) create the pre-conditions that facilitate conversations that allow actors to understand each other’s perspectives so that they can piece together a new strategy for policy administration and resource management (Innes & Booher, 2010; Simms, 2015; Wagenaar, 2011).

Traditions also change in response to dilemmas. A dilemma arises for an individual or institution when a new idea stands in opposition to existing beliefs or practices and forces a reconsideration of existing beliefs and the traditions associated with those beliefs (Bevir & Rhodes, 2003). Traditions change as individuals make adjustments to them in response to specific dilemmas. “Tradition is in principle open to change” (Bevir & Rhodes, 2003, p. 33) and “the horizon of the present is continually in the process of being formed because we are continually having to test all our prejudices”
Therefore, when tradition changes, so does authority, as it is “sanctioned by tradition and custom,” (Gadamer, 2004, p. 281) and the manner in which it is exercised. This happens through the process of dialogue and in response to dilemma. The context for this to happen is provided by governance practices (Figure 7.1).

**Emergence of Present Governance in the Cuyahoga River Watershed**

Several boundaries, such as constitutional rules or “policy tools” such as grants, contracts, and regulations, can be used to define a governance system or network (Hoornbeek, 2011). Through the interviews and observations, the 1987 WQA is the policy that set in motion the emergence of the current Cuyahoga River governance under study. The Remedial Action Plan (RAP) Program to implement the GLWQA (1987 amendments) was key in reinforcing and changing governance within the Cuyahoga River watershed. The findings and the discussion presented here are based on the reconstruction and interpretation of the meanings from the stories and narratives of public administrators and managers, planners and conservationists, and staff of local level watershed collaborations/groups that are most directly involved with the various aspects of implementation of the WQA and the management of the Cuyahoga River overall.

Governance has played a key role in bringing about a fundamental change to the understanding of an urban river like the Cuyahoga. Stakeholders representing developmental, industrial, economic, recreational, commercial, and preservationist interests influence the current governance of the river. The Cuyahoga River has come a long way from being a primary resource for commercial and industrial purposes to being an important and indispensable natural resource that is vital to the long-term
sustainability of not just the cities of Cleveland and Akron, but also the Northeast Ohio region.

**Collaborative Management**

Under the 1987 WQA, the Federal Environmental Protection Agency (U.S. EPA) was required to regulate stormwater discharges from industrial and municipal facilities through stormwater regulations, and strengthen the Total Maximum Daily Load (TMDL) program. The WQA also led to supportive policies such as Section 319 Nonpoint Source Management Program (NPS) that required states to develop management plans for NPS pollution, sought to support geographically based initiatives and activities that address NPS problems, and provided funding support for NPS reduction activities (Shwab, 2010).

The Ohio Environmental Protection Agency (Ohio EPA) is the primary authority responsible for the implementation of the WQA and its five district offices manage the Agency’s program at the local level. These district offices are the primary compliance authority for the WQA related provisions, which for the Cuyahoga River watershed is the Northeast District Office (NEDO) at Twinsburg. The Ohio EPA state office at Columbus oversees the administration of grant programs, including the Section 319 grant. Additionally, other regional level agencies in Northeast Ohio are also involved in policy administration and provide program and training assistance and guidance in the Cuyahoga River watershed.

The nature of NPS management is complex, as several political communities hold jurisdiction over urban drainage, land development and other NPS contributors. The Ohio EPA-NEDO, as the primary regulatory authority in the Cuyahoga River watershed, has been successful at effectively regulating the point source discharges and significantly
improving water quality over the past decades. However, the tributaries of the river, which geographically are parts of several different highly urbanized municipalities, have lower water quality as a result of local land use impacts. During interviews and informal conversations with the NEDO staff members it became clear that there is more to the management process than what meets the eyes. A NEDO staff member made the point that “Ohio is a Home Rule state and other states are different, but we don’t make those land use decisions at a local agency level, we try and build good relationships.” This statement indicates that even through the Ohio EPA doesn’t have authority over local land-use, they try to overcome this limitation through collaboration. Describing the motivation behind forging partnerships, the staff member adds:

I think we are able to be more effective from a regulatory standpoint because people will call me up and we will go to evening meetings, Saturday workshops, training people, we do all that. It has been cool and allows us to do much more than just what the regulations would do (Personal Communication, 2015).

At the regional level, the Northeast Ohio Regional Sewer District is the public utility responsible for wastewater treatment, combined sewer overflow, and regional stormwater management. Most of the point and nonpoint pollution to the Cuyahoga River falls under the jurisdiction of the NEORSD. Apart from its role in wastewater treatment and monitoring and assessment of water quality, the Sewer District, partly on its own initiative, has taken an anticipatory stance towards the restoration of ecosystem health in the watershed. The District has put in place a regional stormwater management program and has supported watershed scale planning and management efforts in the tributary watersheds of the Cuyahoga River through its environmental and stormwater
management program. It also has a close working relationship with the Ohio EPA-NEDO office that is not restricted to a formal regulatory one. In the words of another Ohio EPA-NEDO staff member:

From a permitting and pollution control standpoint the Sewer District is a regulated entity; from the standpoint of a watershed they are much more of a partner, because they have a whole program dedicated to monitoring [...] They do a lot of watershed restoration work and in that sense we don’t view them as a regulated entity, we view them as partners (Personal Communication, 2015).

Talking about their stance on regional stormwater management, a Sewer District staff member says,

We are less of a regulatory influence on nonpoint source. We developed the case for the program for a long time. There is no question about the need for this program because these problems are growing and they are not getting solved at the community level [by the communities themselves] (Personal Communication, 2015).

The District’s justification for its regional stormwater approach is the need to further its mission by managing stormwater at its source. To do this, the agency opened up channels of communication in its stormwater management and partnered with other agencies and stakeholders for various plans and projects. An important contribution that the District has made to stormwater management regionally is to support local watershed groups with operating grants. A Sewer District official noted:
We felt, we are a regional authority, but there are a lot of local actions that have to happen and unless you have grassroots effort and people that are energized around protecting their streams and watersheds bad things are going to happen… We felt it was important to support these groups. *They further our mission* [italicized for emphasis] (Personal Communication, 2015).

The pro-active attitude of the agency staff and the informal relationship-building and leveraging to support and encourage collaborative management actions, which at times required these actors to function beyond the directives of their organizational roles and administrative functions and boundaries, was revealed through phenomenological interviews. Understanding other actors’ perspectives and finding an overarching purpose and common ground that went beyond the goals of the actors’ respective affiliated organizations developed overtime as these actors repeatedly moved out of their comfort zones and interacted through various forums and projects.

**Dialogues and Deliberations**

The RAP process was participatory in nature because of its focus on an *ecosystem approach* for watershed-scale planning and the use of a diverse and representative stakeholder advisory committee (Beierle & Konisky, 2001). Development of remedial action plans is supported by the federal agencies (US EPA), but implementation of recommendations is funded through existing agency or local resources. The development of the Cuyahoga RAP was integral in setting in motion the changes that led to the evolution of networked governance in the watershed. The Ohio EPA appointed the Cuyahoga River RAP Coordinating Committee (RAP-CCC) with stakeholders representing business, relevant government and regional agencies, community groups,
individuals with an interest in the river, and tributary-based watershed groups. A non-profit affiliate, the CRCPO was formed by the RAP-CCC to encourage additional stakeholder engagement in support of the RAP. Although the RAP doesn’t have a regulatory overtone, it is still a process to improve water quality. A Cuyahoga Valley National Park superintendent associated with the restoration of the watershed early on noted that:

RAP really did embrace a sort of kaleidoscopic set of players … It was a pretty cumbersome effort. It was hard to manage and control….and I think it was quite demanding in putting together the various parts and pieces of the remedial action plan for the river, but it had the beneficial effect of involving people from all segments (Personal Communication, 2015).

The inclusiveness and sense of community that the RAP process embodied was a remarkable undertaking at the time (the late eighties) and fundamentally shifted the governance of the watershed. “At the very beginning, everyone is saying, how is it going to affect my life? … Everyone had their walls up because of the Federal EPA at the time, because this was a U.S. EPA thing, it is a regulatory thing…everyone was very guarded. It is not that anymore” (Ohio EPA-NEDO Official, 2015). As discussed in Chapter six, the RAP has changed structurally recently, as a result of the reorganization of the AOC program in Ohio by the Ohio EPA, but the overall mission remains the same. Its quarterly meetings continue to provide a venue for watershed management discussions.

Observing and participating in the RAP quarterly meetings overtime helped me understand, in some part, what the process means and how the various members perceive it and make use of it. The representatives from several member organizations discuss
their work updates and progress regarding various watershed management aspects (including projects and plans), point out lessons learned or gaps to be filled, and share strategies and future plans. The conversations and dialogue were not just limited to the scope of the AOC area (which is what RAP meetings are officially for), but went much beyond it to cover other parts of the watershed. The idea about a regional stormwater approach came from these meetings. Overtime, being in the same room and being part of the discussions helped members to overcome their initial reservations and understand the co-benefits of collaborating and partnering over projects and initiatives. A land conservancy director succinctly summarizes this working relationship, as

You have to have camaraderie within this network because if you just sit there poking the bear you can’t really get anything done. You have to have competition, but you have to have smart competition [among various stakeholders] and internal competition [among watershed groups] is fine because that makes creative, good arguments (Personal Communication, 2015).

**Shift in Understanding**

The RAP process was perhaps the most significant step in bringing the stakeholders together to think about the resource as ‘whole ecosystem,’ and not as parts designated based on the historic use of the river. Issues of jurisdiction, authority, and service area traditionally hindered agencies to work together, even on watershed issues that cross boundaries of political jurisdictions. According to Innes and Booher (2010), under the traditional regulatory model for policy implementation under the CWA, the regulatory agencies created and administered regulations, designed projects, and allocated resources according to the mandates. This also meant that the agencies were
restricted within their mandates, which sometimes were conflicting with those of other agencies. The RAP’s participatory dialogue and deliberation process provided a forum that eventually led to the emergence of a broader network that went beyond the RAP, offered the opportunity to these actors to discover the interdependence of their interests and the usefulness of joint management.

Agencies across policy implementation levels (federal, state, local) and geographic scales were part of the RAP planning process. This included federal level agencies such as the USEPA, the US Army Corps of Engineers, and the National Park Service; state level agencies such as the Ohio EPA and Department of Natural Resources (Ohio DNR), and Board of Health; and local and regional level agencies such as the Northeast Ohio Areawide Coordinating Agency, Sewer District, Akron Public Utilities Management, Cleveland Department of Public Utilities, Cuyahoga County Sanitary Engineering Office, and others such as county level department of environmental services and boards of health. There was also participation from local stakeholders and watershed and community groups. A common understanding about the river as a resource was created over time through the RAP meetings, collaborations on watershed projects, and meetings on planning and restoration projects. These interactions “began to frame the Valley as a single entity, instead of pieces of people of communities. The valley was always some place to cross. A place to get across, so we tried to make it a destination” (Former Cuyahoga County Planning Executive, 2015).

The tributary watershed groups in the Cuyahoga River watershed came to understand the scales and interconnections in watershed management and the geographic and jurisdictional limitations that they faced as well. More recently, some of these groups
have come together to form a broader governance network called the Central Lake Erie Basin group to create more coordinated and focused watershed management work, an effort of sorts to formalize the more informally operating network. A key leader in this effort, who was also the first chairman of the RAP-CCC and a lifelong watershed steward, describes this change in understanding as “that was very surprising to me because I thought that they were thinking about their own watershed, but somewhere in the mind they would think about the bigger watershed [Lake Erie].”

**Evolving Role of Administrative Agencies**

The Ohio EPA and the regional Sewer District played a significant and novel role in fulfilling not just their regulatory responsibilities, but also facilitating collaboration and encouraging broader community participation. The staff at the Ohio EPA-NEDO has been involved with the community closely to fulfill an advisory role in matters related to watershed protection. The staff also made a conscious effort to hire people within the region who understand the local problems and who have strong ties to the community and the stakeholders in regional watershed management. A staff member from the district office describes this as:

> There were folks before me who have handed it over to me and I am trying to do that with the folks who come after me and that is a consistent thought that we have been able to maintain … That has been a conscious choice on how we have been managed at the District … So our folks have always hired people to build that kind of camaraderie where we share stuff that is a conscious thought process that our management has done that resulted in this (Personal Communication, 2015).
The Sewer District, also acted as a partner and as an interdependent actor in the networked governance of various organizational actors. A District staff member recognizing the value of the deliberative nature of governance process says,

Part of my job and the District’s job has always been to educate and inform and we learn from one another. I am learning. I have my opinions and they are just my opinions. Others have theirs. I think it is helpful and healthy to have this [interactions and dialogues] (Personal Communication, 2015).

A key argument that administrators make is “being adversarial” is a typical way in which agencies have traditionally regulated. Working through a loose collective is much more effective since an adversarial way of working doesn’t help address stormwater issues. “Our chiefs and directors in the past have recognized the importance of those interactions … it takes time, and it is much easier for us to improve water quality by working with a group, findings ways to get them funding and then improving habitat” (Ohio EPA-NEDO Staff, 2015).

Through active partnerships, collaborations, and shared responsibility and decision-making, the Cuyahoga River has seen a tremendous transformation. The river continues to have a thriving maritime industry, and the watershed is home to a national park between the cities of Cleveland and Akron, a growing regional recreational attraction, and a hub for urban revitalization. Ecologically, parts of the main river channel meet habitat requirements for exceptional warm water quality. While most of the changes have been remarkable, the river still struggles with issues such as high bacterial levels from combined sewer overflows that restrict swimming contact, stormwater problems in
some of the tributaries and upstream communities because of high levels of imperviousness, and habitat degradation concerns caused by the presence of dams.

**Applying the Theoretical Framework and Implications**

How did the collaborations, shared decision-making, dialogues and interactions, and change in understanding come about? Were these changes serendipitous or was something deeper happening? To describe the transformations in the governance of the Cuyahoga, I explore the change in the nature of eras in water policy through Gadamer’s hermeneutic concepts of *prejudice, tradition, and authority* (Table 7.1).

<table>
<thead>
<tr>
<th>Water Policy Era</th>
<th>Prejudice</th>
<th>Tradition</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive Federalism</td>
<td>Restore the integrity of the nation’s waters</td>
<td>Bureaucratic tradition Command &amp; control</td>
<td>Compliance officer Regulatory authority Enforcement of rules</td>
</tr>
<tr>
<td>(1972-1986)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Federalism</td>
<td>Respond to changing problems &amp; reduce program costs</td>
<td>Experimentation Partnerships</td>
<td>Facilitative authority Open up space for conversation and dialogue</td>
</tr>
<tr>
<td>(1987-present)</td>
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**Table 7.1: Prejudice, tradition, and authority in the federal water policy eras**

**The Era of Directive Federalism**

The era of directive federalism started with the passage of the 1972 CWA and parts of command and control policy implementation is still applicable for point source pollution control and abatement. The CWA had a clear federal directive and control (Hoornbeek, 2011). Characterized by a bureaucratic command and control tradition, the chief goal was to restore the integrity of the nations’ waters, which came from the *prejudice or foreunderstanding* of efficiently and effectively cleaning up various water bodies. The regulatory culture was characterized by the prejudice of ‘waterways as
utilities,’ and this prejudice influenced tradition and authority (See Table 7.1). In order to regulate pollution sources and manage pollution effectively, government agency staff primarily played the role of compliance officers using their regulatory authority to effectively enforce the implementation of the various provisions of CWA. This era relied on prescribed regulatory procedures and substantive rules that limited agency discretion (Innes & Booher, 2003; Sabatier et al., 2005). The bureaucratic model assumes that there is neither diversity among actors nor interdependence of interests. Under this model compliance officers can focus on a single set of goals, and policy implementation follows a hierarchical chain of authority (Innes & Booher, 2003). Linear authority and bureaucratic control were adequate means to deal with end of pipe, point sources of pollution (Sabatier et al., 2005).

The bureaucratic tradition can be understood as “an established belief in the sanctity of immemorial traditions and the legitimacy of those exercising authority under them” (Weber, 1978; p. 215). Authority within such a tradition is commonly associated with power and domination, and the provision that allowed citizens and environmental groups to bring suit against federal and state agencies (if they were not effective in enforcing water quality targets) created an adversarial relationship. Administrators that were interviewed recalled the time in 1970s and early 80s when there was “federalization of authority and heavy reliance on litigation as a strategy” (Sabatier et al., 2005, p. 43) to manage point source pollution. Governing was intrinsically non-participatory. The adversarial relationships that were created by repeated litigations between agencies, environmental groups, and industries served as barriers to effective cooperative work that was required to manage nonpoint source issues later.
Dilemmas emerging from the challenges of complex nonpoint source pollution management, and the increasingly adversarial relationship between agencies and local stakeholders groups, created conditions that led to the rethinking about the tradition of bureaucratic control. Reflection on the tradition of bureaucratic control also led to a shift in the prejudice (waterways as utilities) and led the way for a more collaborative, experimental era in water pollution control and management.

**The Era of Experimental Federalism**

The 1987 WQA marked the beginning of an experimental era in watershed management. Post 1987, the control of nonpoint source pollution became a major goal and was characterized by administrative experimentation rather than congressional control and bureaucratic direction (Hoornbeek, 2011). Congress devolved management of pollution as a state and local responsibility. Unlike the previous era – where distant bureaucrats that didn’t fully understand many of the social and economic impacts on local communities had carried out regulation – the role of the federal EPA was greatly reduced in managing nonpoint source issues. As a result, there was an emergence of “collaborative, place based management” (Sabatier et al., 2005, p. 47) characterized by consensus driven decision making, involvement of multiple stakeholders representing diverse interests, and involvement of agencies as technical advisers and stakeholders (not critical decision makers). Decision-making processes now integrated both scientific and local knowledge, incorporated the concerns of a wide range of stakeholders, and relied upon collaboration and dialogue (Sabatier et al., 2005).
The Hermeneutic Space

With the experimental era in water policy something deeper was occurring. Focusing on the meaning and practice of policy implementation reveals a shift in the ontological understanding created among the governance actors in the Cuyahoga River watershed. Though initially skeptical about cooperative work, owing to the legacy of the directive era prejudicing their perceptions, the actors associated with the management of the Cuyahoga River watershed were slowly and eventually starting to understand the benefits of dialogue and collaborative work. Mutual sharing of ideas, primarily facilitated by the quarterly RAP meetings and other collaborative platforms, had occurred because of the need to carry out inter-jurisdictional work on various plans and projects (such as 319 grant funded projects, creation of Watershed Action Plans in tributary watersheds, etc.).

An interpretive analysis of governance experiences of actors revealed that interactions with other actors through collaborative forums and joint management of projects created a hermeneutic space for the actors to gain a reflexive understanding of one another’s realities of practice. This hermeneutic or ‘in-between’ space, as Hannah Arendt observes, is something to which people belong (Moran, 2000). Such a world lies ‘between’ people. This ‘in-between’ place, is created by engaging in a debate, thinking, bringing forth opinions (as opposed to factual truth), and judgment through reflection (imagining yourself in other’s shoes) and provides a way of public reasoning, albeit a complex one (Stivers, 2008). By carrying out a conversation, engaging in a dialogic process, critically reflecting, and forming a considered opinion, actors could find common ground, even if they are not on the same page regarding management ideas and
decisions. The dialogical meanings that emerge, although held by individual actors, “depend on the agency being shared” (Taylor, 1995, p. 172). By jointly engaging in practices emanating from a need to implement policy and design actions, actors understand themselves and each other through a shared world that is “always there” (Taylor, 1991, p. 308). Thus meaning is constructed between agents and between agents and the world through the hermeneutic space.

This hermeneutic space and the shift in the ontological understanding of governance itself shaped the prejudice (foreunderstanding) associated with the Cuyahoga River. This shift in prejudice also shifted tradition and authority associated with the management of the resource (Figure 7.2).

Figure 7.2: Hermeneutics and transformation: Governance in the Cuyahoga River watershed
Prejudice

The management of nonpoint source issues in the Cuyahoga River watershed required agencies, local watershed groups, planners, and municipalities to engage collaboratively. Agency staff, instead of behaving as regulators and distant bureaucrats, started acting as watershed partners. The quarterly RAP meetings constituted by a broad representation from various policy relevant publics, started changing the regulatory overtone of the directive era that considered the river as a something that ‘needs to be fixed’, to an inclusive community resource driven by a strong sense of place. Through repeated engagement, interactions, and dialogue, the adversarial nature of relationship among various agencies and between agencies and watershed groups overtime transformed into that of mutual respect and understanding.

According to Bevir and Hall (2011), the dilemmas arising from the complex interconnections between the social and the ecological elements in a watershed and the effect that these interactions have on the management of NPS issues lead planners and public managers to open up to collaborations and innovative practices in watershed related decision-making processes. In the case of the Cuyahoga River watershed, collaborative watershed projects (restoration and conservation, green infrastructure, watershed and land-use planning, etc.) started shifting the overall purpose of governance, which was not just cleaning up the pollution in the river, but also making the river valley a recreational destination, improving residential and commercial activities along the river banks, and so forth. The trust and the shared understanding that had developed was in large part because of the open channels of communication and a process of dialogue on key issues and even on points of disagreement between various actors.
Dialogue in participatory governance (Beierle & Cayford, 2002; Fung & Wright, 2003), collaborative governance (Freeman, 1997, Sabatier et al., 2005), or deliberative democracy (Gastil & Levine, 2005; Innes & Booher, 2003), unlike traditional adversarial debates, is a reasoned exchange of viewpoints among participants. Dialogues take place in an atmosphere of mutual respect, where the goal is to reach a better mutual understanding (Bingham, 2011). Gaining mutual or shared understanding is precisely the point of hermeneutic dialogue. This type of understanding comes through experience, as evident in the years of work on the Cuyahoga River watershed by some of the government agency staff, planners, and local watershed groups. Such dialogue restores communication towards the service of emancipation, rather than maintaining the technocratic status quo. This process began something that was happening through the inclusion of local knowledge and a variety of perspectives in watershed management in the experimental era as opposed to the earlier directive era.

The limits posed by the bureaucratic tradition and regulatory control (horizon of the past), from a hermeneutic standpoint, created the foregrounding against which the current collaborative and networked watershed management (horizon of the present) emerged. Crucial for this process is the ability to not just understand what lies within the horizon, but also being able to see beyond it. In other words, “acquiring the right horizon of enquiry for the questions evoked by the encounter with tradition” (Gadamer, 2004, p. 302). As the horizons (of understanding) of the governance actors move to and fro between past and present and expand, their prejudices, which are linked to horizons, are also overcome. This means that the horizon of the past that is associated with the bureaucratic tradition based on ‘resource as a utility’ forms a foregrounding against
which the horizon of the present or the current tradition of collaborative management emerges. *Fusion of these horizons* played a part in actors’ testing their earlier prejudices and overcoming them, and enabled emergence of their knowledge that the Cuyahoga River is more than a utility.

**Authority**

The folks here recognized the importance of building these connections; it is outside of our regulatory authority… and that is those partnerships that you never trained for in college and our regulatory programs don’t necessarily say that stuff (Ohio EPA staff) (Personal Communication, 2015).

In this statement, even though the public official is using the term ‘authority’ in the traditional sense, the manner in which authority is being exercised is meant differently. The Ohio EPA in Columbus and the staff at the NEDO office at Twinsburg, and other agencies such as the Regional Sewer District, the Board of Health, and County Planning Commission, acted as partners in watershed management efforts. Within this networked watershed governance, “the public official is required to fulfill the formal mandate of his office and to transcend the conventional public sector hierarchies and structures to forge cooperative, collaborative, and quasi-market arrangements with other state and non state actors” (Considine & Afzal, 2011, p. 377-378). It is also evident from the discussion on collaboration and evolving role of administrative agencies that with multidimensional agency power involved in the management of the Cuyahoga River, authority is synonymous with ‘navigational competence’; the administrator is entrepreneurial and the bureaucracy is facilitative in nature (Sørensen, 2002).
Authority, according to Gadamer (2004), is based on the acknowledgement of knowledge, and cannot be bestowed, but must be earned. Real authority lies in the ability to open up questions, and not the sanctions that it might bring to those that don’t observe or obey it (Lawn, 2006). Authority is not what is derived from office based on the hierarchy, but what makes such authority possible (Gadamer, 2004). What is evident from the interviews and conversations with the public managers working in the Cuyahoga River issues is that they opened up space for collaborations and dialogues in recognition of the genuine need for understanding the watershed through a diverse set of ideas and local knowledge. By working through informal interactions with community members, communicating and partnering with each other, maintaining an institutional memory by creating an intentional hiring process, authority became based in a facilitative manner that shaped tradition and prejudice.

**Tradition**

In traditional bureaucracies, accountability was derived from a legal strategy driven by compliance. Networked governance derives “substantial legitimacy from its ability to ‘join-up’ and harmonize the objectives of several different actors” (Considine & Afzal, 2011, p. 379). A shift was occurring in the organizational nature of the government agencies, as evident from the descriptions of the administrators at the Ohio EPA-NEDO office and the Sewer District’s work on the Cuyahoga. The evolution of the organizational culture also paralleled the overall changes that were taking place, creating an institutional memory for collaborative watershed work.

From a government standpoint, when you are looking at the bureaucracy, what we have done here goes against the bureaucracy would normally do. It is only due to
the fact that we have been allowed to walk on the edges and interact […] While probably all the other citizen groups have this narrow vision is that they deal with this bureaucratic junk, it is boring and very regimented, where people just follow the rules and don’t really interact with the citizen’s groups. I can only be so effective suing a sewage plant. I can sue them so many times; eventually they are going to meet our regulations. But that doesn’t mean water quality is going to be better (Ohio EPA-NEDO staff) (Personal Communication, 2015).

Looking at this shift from Gadamer’s (2004) horizon of the past, bureaucratic tradition and regulatory control is always in motion. Even though there is the maintenance of the overall tradition of governing institutions and bureaucracies, it is being constantly changed and modified, reworked and interpreted, by each subsequent generation of administrators. Hermeneutics is not about abandoning of traditions, but foregrounding them so that they could be modified. Fulfilling their roles as bureaucratic officials doesn’t preclude the administrators from facilitating collaborations and working through partnerships. In fact, bureaucratic role acts as a background against which the current beliefs and actions of the administrators emerge in response to the existing nature of the dilemmas posed by complex natural resource management issues.

It is evident from the case of the Cuyahoga River that the tradition of a bureaucratic agency has shifted to a more experimental and partnership-oriented form. This is apparent from the continued efforts of the agency staff to train newer administrators in the culture of collaborations and maintenance of an overall cultural strategy of “organizational convergence based on core public sector values” (Considine & Afzal, 2011, p. 379).
Implications and Conclusion

This chapter offers a theoretical framework to understand the emergence and the shift in governance that occurred in the Cuyahoga River watershed. An interpretive inquiry and a hermeneutic exploration of the practice of administration and the experience of the governance actors revealed that participating in and practicing collaborative management activities led to the promotion of a more harmonious community. A dialogic space was created by the dual forces of shifting policy and governance focus in the late 1980s and the efforts of the local governance actors that modified the structures and processes under the WQA provisions and the RAP planning to institutionalize local capacity. This included perpetuating collaborative processes, collaborating with citizens and community partners, and reflecting regularly on experiences and collaborative practices (Stivers, 2008).

Engaging in deliberative settings led to a tolerant understanding of differences and forging new social bonds, concepts, and practices. A shift in understanding was occurring, something that can be best described through the “logic of appropriateness” where patterns of practice overtime create a shared understanding among members about their collaborative activities. The patterns of practices therefore are a form of constructed social reality, constructed via interchanges among people (Bevir, 2009; Stivers, 2008). Thus, the dialogues and deliberations were transformative, their aim being not “simply to solve practical policy problems but also, and arguably more importantly, to transform the lived context in which those problems arise” (Bevir, 2009, p. 70).

It is important to recognize the structures and the processes that promote institutional reflection and learning for thinking about a change in the culture and
organization of administration and practice. Results of this study indicate several implications for this vision of administration and governance for future research and practice.

First, the ontological understanding of governance is important. This understanding shapes how actors understand governance and function within it. A hermeneutic process is occurring when there is a context provided to actors to work collaboratively with other actors and they also, in turn shape the context. This hermeneutic process creates an ontological understanding of what governance means and how it transforms. An ontological understanding leads to the exploration of the very nature and meaning of governance and the role of dialogues, deliberations, and collaborations within it. This would also mean not just understanding the implications of dialogue, deliberations, and collaborative activities, but also understanding meaning and the context in which these arise – by interpreting governance. For example, understanding governance as a democratic process furthering democratic ideals and understanding that action is shaped “by shared rules and understandings and by a common sense of what the situation requires” serves this purpose. Values such as productivity and efficiency are not lost within such an ontological shift, but placed within a larger context of democracy, community, and public interest (Denhardt & Denhardt, 2000).

Key practical actions under this understanding would be 1) creating opportunities for groups, actors (managers, elected officials, administrators), and citizens to participate in public problems and thinking of alternative ways to deal with them; 2) developing citizen groups and institutional capacity to take action; 3) organizing people’s attention
and organizing and conducting meetings that promote productive discussions; 4) creating capacity among all parties to engage in effective collaborative processes; and 5) reflecting on experiences and practices collaboratively and promoting institutional learning based on that reflection (Stivers, 2008).

Second, an interpretive understanding of governance leads to a rethinking of the practice of administrative skills and how administrators can build on these skills. While hierarchy is still considered to be a rational instrument of authority for maintaining accountability and persistence, the practice of bureaucracy within it can afford more flexibility. Different types of administrative and professional skills are required by public administrators to be effective in the era of governance. Policy and public administrators need to re-examine their roles as all-knowing experts and shift to a deliberative learner and interpreter – learning from other governance actors and participants in collaborative governance arrangements and constantly interpreting rules, participation and collaboration. Decision-making within such arrangements comes from shared learning experiences, emanating from discussions. This would also mean re-educating themselves as cooperative partners or participants rather than expert managers in the governance process. Within collaborative and networked forms of governance, bureaucrats need to be entrepreneurial, mediating, and facilitative. This involves continuous learning on the part of administrators about shaping their skills – moving from traditional budgeting, research, and management skills towards building skills of listening, communication, negotiation and persuasion, modulation and facilitation, and self-knowledge (Agranoff, 2003; Bingham, Nabatchi, & O’Leary, 2005; King, Feltey, & O’Neill Susel, 1998; Sørensen, 2002).
Third, a shift in the manner in which authority is understood and exercised is key for being effective public managers in a new governance system and in order to be flexible to develop the ability to transform governance overtime. It has been demonstrated through this study that within governance and new collaborative forms of management the authority exercised by administrators and bureaucrats is facilitative and enabling. Administrators should recognize the key role that they need to play in establishing and maintaining horizontal relationships of authority in order to manage complex natural resource management issues and governance process. Public administrators should think about the cultivation of such authority within organizational culture and creating institutional memory based on that. Such administrative and transformational leadership is key in aligning public sector organizations and organizational culture to the overall governance environment.

Lastly, the exploration of meaning and practice of governance through an interpretive approach that is presented in this study is relevant to policy makers and public managers by providing a framework to think about administrative and policy tools (e.g. authority, accountability) and governance tools (e.g. networks, collaborative arrangements) to manage complex policy issues.
CHAPTER VIII

SUMMARY AND CONCLUSION

This dissertation explores how actors and stakeholders shape meanings of policies through their perceptions, dialogues, and collaborations, which in turn shapes resource management actions within context of the Cuyahoga River watershed governance. I also examine how actors actively shape the building of adaptive capacity for governance to respond to future changes and/or disruptions. Adaptive governance is a function of understanding SES. Through my research I demonstrate how governance has adapted and how that happened in the Cuyahoga River watershed.

I examined the Cuyahoga River watershed in terms of characterizing and analyzing it as an SES. I also interpretively explored the role of meaning-making and experiential understanding of watershed governance actors in shaping and shifting governance processes. Further, using a philosophical hermeneutic lens, I explored how dialogues and deliberation and the creation of a hermeneutic space shape tradition, authority, and prejudice in governance. I used a combination of approaches including ethnography, interpretive phenomenological analysis, and network mapping to inform the interpretive methodological framework. Using the case of the Cuyahoga River watershed,
I demonstrate building of capacity for adaptive governance in the watershed and the transformations in ideas, practices, and actions that are have led to a profoundly different way of governing this urban resource.

The governance of the Cuyahoga River watershed means many things to many actors, each based on their sometimes overlapping, and sometimes distinct interpretations. Using an interpretive approach I access perspectives and practices of actors that might not be visible or accessible otherwise, and act as a translator to bring these interpretations to policy-relevant academics, agency staff, or community groups. I focus on understanding policy and governance outcomes, not through the means of traditional policy analysis and evaluation, but through “fundamental-level” changes or outcomes. These outcomes include building of social capital, idea generation and change, ability to be flexible and the capacity to self-organize towards newer governance forms, an ontological shift in understanding governance processes and the influence of that in the practice of administrative skills, and creation of public value through practice. Figure 8.1 presents a summary of the results and analysis.

**Adaptive Governance and Evolutionary Resilience**

Each of the three results chapters, that is, chapters five, six, and seven, present an aspect of my analysis. First, I use a resilience-based approach to develop an assessment framework for analyzing an urban SES. Using this framework I examined the ecosystem services provided by the Cuyahoga River watershed, the biophysical and social factors, and governance and management influences in the watershed system. The specific focus on governance and management influences is key here, as most prior research completed using resilience assessment frameworks focus on the biophysical and social factors and
subsume management influences within social factors. While management influences are integrally linked to social factors influencing a watershed, a separate analysis of management and governance influences requires requisite knowledge of policy and planning interventions (Mitchell et al., 2015). A detailed analysis of these components reveal the current factors, stressors, and future uncertainties, as well as the management pathways, institutional set up, and networked capacity, required to address change at a governance level. Second, building on the results presented in Chapter 5, in Chapter 6 I further explore the experiences of governance actors and their meaning-making activity regarding their practice and organizational roles in the governance processes. The interpretive exploration revealed deeper tacit understanding among actors regarding organizational policies, governance limitations, policy limitations, gaps in knowledge regarding management, and development of newer ideas, practices, and management innovations that are able to overcome the challenges that actors face in their practice. Lastly, in Chapter 7, I explore the transformation in governance in the Cuyahoga River watershed through a hermeneutic philosophy lens, which reveals that participating in and practicing collaborative management activities led to the promotion of a more harmonious community. A dialogic process and a hermeneutic space, along with a shifting nature of understanding created an ontological-level transformation in ideas and practices of watershed actors.

Adaptive governance mechanisms that addresses societal needs and desires in adapting to changing conditions and includes actors, organizations, networks, and institutions. Adaptive governance is especially well suited for decision making under uncertain and incomplete human knowledge of a system (Chaffin et al., 2016). Folke at
al. (2005) point out four attributes that are critical to resilience-building for adaptive capacity:

- Knowledge and understanding of SES dynamics, change, and disturbance;
- Adaptive management practices – including leadership, creating a learning environmental, and recognizing the diversity of people and strategies;
- Support for flexible institutions and multilevel governance systems; and
- Capacity to respond to and shape change by dealing with external perturbations, uncertainty, and surprise

The results of this research reveal various attributes of adaptive governance that have emerged in the Cuyahoga River watershed. For example, government agencies with distinct mission and organizational goals that might be parallel to the goals of other agencies, but not necessarily overlap, have found common areas of policy implementation that fulfill each organization’s mission. This also holds true for agency scales and operations of work. Bureaucratic agencies have learned to interpret their bureaucratic tradition more broadly, which has shifted the manner in which they exercise authority. These organizational level changes lead to the creation of flexible institutions in terms of accountability, decision-making, and learning within the organization (see Figure 8.1).
Figure 8.1: Summary of the results (adapted from Lebel et al., 2006)

A range of actors from various communities of practice have formed informal networks of association in the watershed, be it for planning activities, project implementation, or other watershed-related management actions. Interview results show that the creation of informal interorganizational and interpersonal networks has increased success in obtaining grant funding, and in effectiveness of policy compliance and
implementation. Further, flexibility within organizations to adapt their mission, practices, and culture (e.g. West Creek Conservancy, and the Ohio EPA-NEDO) shows local self-organization. Capacity to create flexibility in institutional setup, and adaptability in organizational mission and culture exhibits that the governance system is able to shift and change with feedbacks from the management, biophysical, and social components of the SES. In terms of learning, emergent change exhibited by governance systems demonstrates that organizations and actors within these systems continuously adapting, learning, and improvising (Termeer et al., 2017). This is an ongoing process where each shift in practice generates the conditions for further breakdowns and innovations (Orlikowski, 1996).

Scholars have argued that because of the transient nature of adaptive governance processes and the constant changing nature of SESs, institutionalization of adaptive governance has remained elusive. Further, adaptive governance processes maintain the overall system dynamics and system configurations of factors associated with the particular SES, and hence, fall short of actively encouraging the transformation of current governance systems (Chaffin et al. 2016). While transformations do require deliberate and intentional planned interventions for regime change, the results that I presented demonstrate that in the Cuyahoga River watershed governance transformations that are both deliberate and intentional (e.g. Flats Forward Initiative, RAP process) as well as slow and incremental (e.g. hermeneutic space created due to dialogue and deliberations, processes leading to the formation of CLEBC) have occurred, and both play an equally critical role in building resilience within the watershed. However, adaptive governance processes are key prerequisites for transformative governance, sharing similar qualities,
and considered different points of the same spectrum of governance, even though adaptive processes can be interrupted in the short-term due to the intentional interventions for transformational change (Chaffin et al., 2016; Termeer et al., 2017).

As discussed in chapters five and six, the mid-1980s saw a move towards a more experimental and collaborative regulatory era in water pollution control and management and there was also an ensuing federal agency-level shift to a risk-based environmental management and decision-making framework. This movement opened up questions such as: Should there be more regulation of business practices? Who bears the cost of policy risks and outcomes, and how do policy stakeholders or experts make these decisions (Andrews, 2006; Eliadis, Hill, & Howlett, 2005)? Within this context of regulatory environment for federal water pollution management, two key outcomes from the results of this study have implications for governance of watersheds: the emergence of interpretive communities in watershed management; and the evolution in the role of government agency staff from traditional bureaucrats to watershed partners. These outcomes can be viewed as levers that add to the evolving nature of governance traditions and the practice of policy implementation. Recognition of these levers and accounting for them in watershed management (e.g. decision-making, policy design, implementation) can enable a more informed and adaptive watershed governance.

Further, as the direction of urban watersheds and their governance is changing owing to broader climate related and socio-economic uncertainties (e.g. planning and technology related influence of practices and sessions, market-based mechanisms, changing priorities of project funding, reduction in funding opportunities), SESs and their governance systems should be able to incorporate the dynamic relationship between
elements of persistence, adaptability, and transformability across multiple types, scales, and timeframes of management. This is called “evolutionary resilience” (Davoudi, 2012). In the Cuyahoga River watershed the work of the governance actors in managing non-point source pollution management and watershed restoration and protection since the late 1980s through agency programs and policies, watershed groups, regional initiatives and similar actions show persistence in watershed work. Movement of actors across organizations, cross fertilization of ideas, informal networking and capacity building, and coming up with innovative ideas in dealing with organizational and management limitations show perseverance in watershed work. Governance processes reflect adaptability in decision-making and organizational practices and the creation of a learning environment. And finally, as I discussed in Chapters Six and Seven, transformability of ideas, practices, approaches, and scale of work depict the ability to intentionally create newer regimes of governance.

**Directions for Future Research**

Future research could benefit from using a combination of interpretive/qualitative method as used in this project and quantitative approaches/techniques such as agent-based modeling and social network analyses as suggested by Morçöl (2012).

As the research process and the interviews revealed, organizational changes in policies, flexibility in strategies, designing of new ideas and initiatives, informal networks of association for expertise and resource mobilization and other such elements of adaptability, though intentional (and sometime serendipitous), are not always designed as well-constructed process-interventions. These processes are more emergent, and hence arises the challenge with adaptive governance as transient and not easily institutionalized.
A way to achieve emergence of adaptive governance would be by creating space for “accidental” and “unintended” policy consequences and creation of space for innovation as a criteria for evaluation. For example, accounting for the capacity of the RAP process in creating collaborative capacity in the watershed as a measure of program evaluation, even though the Cuyahoga River AOC has been unsuccessful in meeting policy targets in terms of delisting.

Since the language of governance has yet to come to terms with the language of hermeneutics, a pathway for future research is to explore what happens in the hermeneutic space that is created through dialogues and interactions between actors. This exploration will be helpful in designing collaborative watershed management initiatives and filling gaps in the existing service areas in the watershed. An example would be the development of a regional approach to encourage or incentivize municipalities to adopt and implement riparian setback ordinances.

Another pathway for future research is testing whether and how adaptive capacity for governance is supported by the existence of networks that operate across scales and shift configuration depending on the policy arena in which they are working, and whether this allows the governance network to respond to and accommodate change in scientific and social understanding over time (Garmestani & Benson 2013; Karkkainen 2004).

Finally, post-industrial cities can benefit from transformative governance based on Integrated Water Management (IWM), a framework for coordination of development and management initiatives for water, land, and related resources. A transformed water governance regime can enhance economic and social welfare in an equitable fashion while maintaining the sustainability of vital ecosystem functions (Chaffin et al., 2016;
Mitchell, 2005). Future research could focus on the following questions: What governance innovation facilitates the transition towards integrated urban water management? How can transformative governance for IWM be operationalized and how do urban communities make this governance transition? What are the metrics that can be used to evaluate the success of this transition? The overall purpose of this research direction will be to develop concrete indicators that can be used by communities to design a governance transition towards integrated management of water resources.
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APPENDICES
### A. Planning documents reviewed

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<td>A Community Guide for Restoring the Cuyahoga River: The Cuyahoga Delisting Action Plan</td>
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<td>2014</td>
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</tbody>
</table>
### D. Observations conducted

<table>
<thead>
<tr>
<th>Category</th>
<th>Meeting/Event</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>Community Meetings</td>
<td>Friends of Euclid Creek Monthly Meeting</td>
<td>2015</td>
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<tr>
<td></td>
<td>Friends of the Crooked River Annual Meeting</td>
<td>2015</td>
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<tr>
<td>Summits and Events</td>
<td>Urban Forestry Summit</td>
<td>2014</td>
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<tr>
<td></td>
<td>Cuyahoga River Symposium</td>
<td>2015</td>
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<tr>
<td></td>
<td>Cuyahoga River Symposium</td>
<td>2016</td>
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<tr>
<td></td>
<td>David Stradling Discussion on Cuyahoga River</td>
<td>2015</td>
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<tr>
<td>Planning Meetings</td>
<td>Big Creek Balanced Growth Plan Meeting</td>
<td>2015</td>
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<td>Balanced Growth Community Meetings</td>
<td>2015-16</td>
</tr>
<tr>
<td>Project Tours</td>
<td>Cuyahoga River Restoration Project Tour – Summit County</td>
<td>2014</td>
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<td></td>
<td>Cuyahoga River Restoration Project Tour – Green Infrastructure</td>
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<td></td>
<td>Cuyahoga River Boat Tour (with Port Authority)</td>
<td>2015</td>
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<tr>
<td>Public Hearings</td>
<td>Army Corps of Engineers Public Hearing – Open Lake Disposal</td>
<td>2015</td>
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<tr>
<td></td>
<td>Ohio EPA Public Hearing - Open Lake Disposal</td>
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<tr>
<td>Public Meetings</td>
<td>Cuyahoga AOC Update Public Meeting</td>
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<td>Watershed Model Regulations Meeting</td>
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<td></td>
<td>Akron Water Utilities Stakeholders Meeting</td>
<td>2015</td>
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<td></td>
<td>Port Authority Meeting</td>
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<td></td>
<td>NEFCO ERTAC Meeting</td>
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<tr>
<td></td>
<td>AOC Advisory Committee Meeting</td>
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