

# **Respecting Outcomes in Collaborative Processes: A low water response case study**

by

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## **AUTHOR'S DECLARATION**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

## ABSTRACT

Government agencies in Canada are increasingly using collaborative approaches to inform decision-making for complex policy problems. Collaborative approaches encourage participants to share resources and knowledge to build a working relationship for confronting mutual challenges and determining agreeable solutions. It is often assumed that collaborative approaches are cost effective, and lead to solutions that are easier to implement than conventional government decisions. However, a significant challenge is the tendency of government to undermine collaborative processes by setting aside the decisions reached by the collaborative body. This can result in participants being unreceptive to further government actions and blocking implementation because they feel their opinions were not respected. Low Water Response in Ontario was selected to study how outcomes are incorporated into government decision-making and whether outcomes are being protected by government. Three case studies in southern Ontario were chosen based on their experiences with severe low water conditions. The Institutional Analysis and Development framework was used to structure research. This framework studies contextual characteristics, decision-making structures, how participants interact, outcomes, and evaluation to answer research questions. Provincial, watershed and individual scales of analysis were investigated. Interviews assessed the perspectives of stakeholders in water response teams including provincial government, municipalities, conservation authorities and large-scale water users (over 50,000L/day). Document analysis provided contextual information and key factors regarding Low Water Response implementation. Personal observations provided an opportunity to cross-check information from interviews and document analysis. Findings show that the provincial government incorporated the input of each case study similarly, but each WRT felt differently about whether outcomes were being protected by the government. Largely outcomes are respected by government in Low Water Response despite the fact that the most serious level of drought response (Level 3) has never been declared even though conditions for declaring Level 3 have been met on multiple occasions. There were many positive social outcomes that were evident from collaboration and participants felt that the process was beneficial.

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## **LIST OF ACRONYMS**

CCCA: Catfish Creek Conservation Authority  
GRCA: Grand River Conservation Authority  
IAD: Institutional Analysis and Development Framework  
LWR: Low Water Response  
MNR: Ministry of Natural Resources  
MOE: Ministry of Environment  
NVCA: Nottawasaga Valley Conservation Authority  
OMAF: Ontario Ministry of Agriculture and Food  
OWDC: Ontario Water Directors Committee  
PTTW: Permit to Take Water  
WRT: Water Response Team

# Chapter One

## Introduction

### 1.1 Problem Context

Innovative decision-making is required to resolve complex policy problems that are common in water resources management. Conventional government approaches to these challenges have led to solutions that do not necessarily protect the environment, that are cost intensive, time-consuming, and that trigger administrative disagreements (Ryan and Bidwell 2007). Conventional government decision-making is characterized by top-down, government-centric control that prioritizes technical and expert based solutions (Watson, *et al.* 2009). An alternative to conventional government problem solving that is growing in popularity is collaboration. Collaborative approaches encourage sharing resources and knowledge among multiple stakeholders to build a working relationship and collectively confront mutual challenges (Gray 1985).

Collaborative approaches emerged in the United States during the 1980s and proliferated in many countries and fields, including social studies, business, and environmental governance (Ryan and Bidwell 2007; Selsky and Parker 2005). The use of collaborative approaches for decision-making expanded in environmental fields because: command and control approaches for protecting the environment were perceived as ineffective (Bidwell and Ryan 2006); the public were demanding a greater role in decision-making (Bidwell and Ryan 2006; Robinson, *et al.* 2011); and government was downloading responsibilities to non-government agencies and lower government levels (Conteh 2013; Koontz 2005; Taylor, *et al.* 2009).

Collaborative approaches continue to be used for complex policy problems because it is assumed by practitioners that outcomes resulting from collaboration are easier to implement and more cost-effective than conventional government solutions (Bidwell and Ryan 2006; Connick and Innes 2003; Emerson, *et al.* 2012; Hardy 2010; Lockwood, *et al.* 2010; Robinson, *et al.* 2011). In some cases, collaborative processes are actually created by governments. Government-led collaboration can more specifically be defined as “a governance 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” (Ansell and Gash 2007, 544). Complex policy environments require cooperation among multiple agencies, levels of government and non-government actors to implement policy (Conteh 2013; von Korff, *et al.* 2012).

As governments increasingly use collaborative approaches to inform decision-making, challenges have begun to emerge. A significant challenge is the tendency of government to nullify collaborative processes by not incorporating outcomes into final government decisions (Kallis, *et al.* 2009). This challenge may stem from a misunderstanding of the role collaborative processes play in representative democracies (Kallis, *et al.* 2009; Smiley, *et al.* 2010). Understanding the challenges that governments face in effectively using collaborative approaches is important for improving decision-making and the impact from decisions.

Many authors have identified the need for continued and context-specific research investigating the inclusion of collaborative bodies in formal government decision-making (Emerson, *et al.* 2012; Hardy 2010; Holman 2013; Ryan and Bidwell 2007). Furthermore, the environmental management literature has detailed cases where governments have failed to follow through with collaboratively determined outcomes (Kallis, *et al.* 2009; Richie, *et al.* 2012). This has led to the dissolution of these processes and group members being resistant to future government action because they feel slighted (Kallis, *et al.* 2009; Richie, *et al.* 2012). Understanding the relationship that forms between collaborative bodies and government and the impacts of superseding the outcomes of collaborative processes would provide clearer results of what government-led collaborative processes actually produce.

Outcomes in collaborative processes can be considered “the effects of the collaborative process and its outputs on changing social and environmental conditions” (Mandarano 2008, 457). Outputs are the tangible products that are created by collaborative processes, such as management plans. The importance of measuring tangible and intangible outcomes from collaborative processes has been emphasized for over a decade (Connick and Innes 2003; Koontz and Thomas 2006). Early evaluations of collaborative processes focused on process and social outcomes (Mandarano and Paulsen 2011). However, increasing emphasis is being placed on the importance of evaluating the impact and implementation of collaborative processes (Koontz and Thomas 2006; Ryan and Bidwell 2007). Determining whether government is respecting the outcomes from collaborative bodies requires comparing the outcomes reached by the collaborative body with the government’s final outcome.

A number of frameworks have been created that attempt to determine the strengths and weaknesses of various collaborative arrangements (Sabatier, *et al.* 2005). Some of the most popular frameworks for assessing collaborative processes include the Advocacy Coalition Framework (Sabatier, *et al.* 2005; Sabatier and Weible 2007) and the Institutional Analysis and Development (IAD) framework (Imperial 1999; Ostrom 2011). A framework that suits the contextual setting of the collaborative process can be helpful for evaluating collaborative groups. For instance the IAD framework is beneficial for studying collaborative situations where decision-making happens at multiple levels or if detailed knowledge is required for how decisions are made and by whom. These characteristics make the IAD framework ideal for investigating government-led collaborative processes.

Governments are increasingly using collaborative approaches to inform decision-making. Thus, it is essential to clarify the relationship between governments and collaborative groups (Gerlak 2008; Newig and Fritsch 2009), and to ensure that inputs from collaborative groups are incorporated into final government decision-making (Ison 2010). Ontario Low Water Response (LWR) provides the opportunity for a case study to investigate the relationship between government and collaborative bodies, and to determine whether governments are protecting outcomes in Ontario, Canada. LWR uses local, collaborative water response teams (WRT) to ameliorate the impacts of low water in watersheds. The team deliberates on local watershed conditions to determine the severity of low water and plans response options including conservation, restrictions and regulation based on three response levels. The most dire designation is Level 3. At Level 3 the Ministry of Environment (MOE) is responsible for limiting water taking through the Permit to Take Water program (PTTW). The decision to enter a Level 1 or 2 designation is decided by the WRT, but at a Level 3 the control is relinquished to the Ontario Water Directors Committee (OWDC). A Level 3 has never been designated in Ontario despite

conditions on-the-ground that characterize the necessity for declaring a Level 3 and recommendations from WRTs to issue a Level 3. Declining the recommendation of WRTs to declare a Level 3 raises the potential that the government is not protecting outcomes from collaborative bodies.

## **1.2 Research Purpose and Objectives**

The purpose of this research is to investigate a government initiated collaborative process to understand how outcomes from collaborative groups are incorporated into final government decisions and to what extent governments are protecting collaborative outcomes.

The research objectives are to:

- 1) Establish a conceptual framework that builds on the IAD framework to understand the link between government and collaborative bodies and to evaluate how government protects outcomes.
- 2) Apply the conceptual framework to the case study of Ontario LWR to determine how the Government of Ontario uses decisions from WRTs and whether the government is using recommendations put forward by WRTs in final decision-making.

## **1.3 Thesis Organization**

This thesis is organized into six chapters. This first chapter reviewed the key research concepts, defined important terms and outlined the purpose and objectives of the study. The second chapter expands on Chapter One to provide an in-depth overview of the collaborative governance and environmental management literatures; the conceptual framework is presented at the end of the chapter. Chapter Three explains the research methods used to gather data. The fourth chapter elaborates on LWR in Ontario and details the contextual settings for each case study. Chapter Five presents the results of analysis. Finally, Chapter Six discusses how this research contributes to collaborative governance literature and outlines opportunities for further research. Chapter Six also discusses recommendations to governments for including collaborative processes into decision-making and steps to protect outcomes from collaborative bodies.

# Chapter 2

## Literature Review

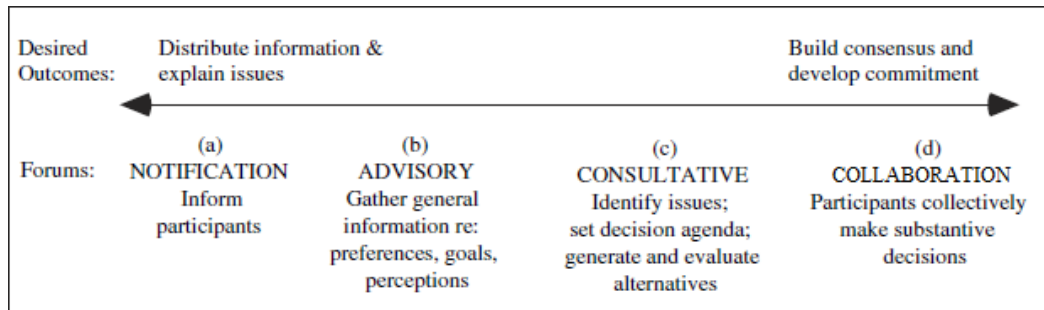
Chapter Two establishes the background for researching collaborative processes, specifically government-led arrangements and the nature of outcomes from collaborative approaches to decision-making. Four broad themes are discussed in this chapter: (1) the characteristics of government-led collaborative processes; (2) evaluation of collaborative outcomes; (3) institutions and collaborative processes; and (4) the IAD framework. Theme 1 differentiates types of multi-actor approaches to decision-making and characterizes government-led collaborative processes. This assists in understanding evaluation methods in Theme 2 that are specific to government-led collaborative approaches. Institutional aspects of collaborative processes and institutional change are introduced in Theme 3 to provide a foundation for understanding the IAD framework (Theme 4), which is focused on institutions. The IAD framework is central to the conceptual framework presented at the end of this chapter. The IAD framework is useful for understanding government-led collaborative approaches to decision-making because it examines multiple scales, considers context and investigates details of the decision-making process.

### 2.1 Theme 1: Government-led Collaborative Processes

#### 2.1.1 Distinguishing Types of Participatory Governance

There are many terms for multi-actor arrangements that involve collective decision-making. Central to these participatory governance methods is that participants share decision-making authority and have a stake in the outcome of the arrangements (Plummer and FitzGibbon 2004). Definitions and processes for these terms are numerous, continually evolving and have an overlapping nature. Within each arrangement there are differences in group formality and the extent to which multiple perspectives are integrated, ranging from providing information or consultation to a formal role in deliberation and final decision-making, see Figure 2.1 (Carlsson and Berkes 2005; Cowie and Borrett 2005). Partnerships, co-management and collaborative governance are the most common terms used in participatory natural resource management and are further distinguished to understand their characteristics.

**Figure 2.1 Degrees of Participant Authority in Decision-making**



(Adapted from: Cowie and Borrett 2005)

Partnerships are a “process of building new social relationships among actors from different segments of society” (Newell, *et al.* 2012, 375). Partners work in their area of comparative advantage to promote collective group objectives (Plummer and FitzGibbon 2004). Actors who are included in the process tend to already have a presence in decision-making; involvement of marginalized voices is uncommon (Newell, *et al.* 2012). Partnerships are less autonomous and often dissolve after the task has been completed, but may re-emerge if a shared challenge returns.

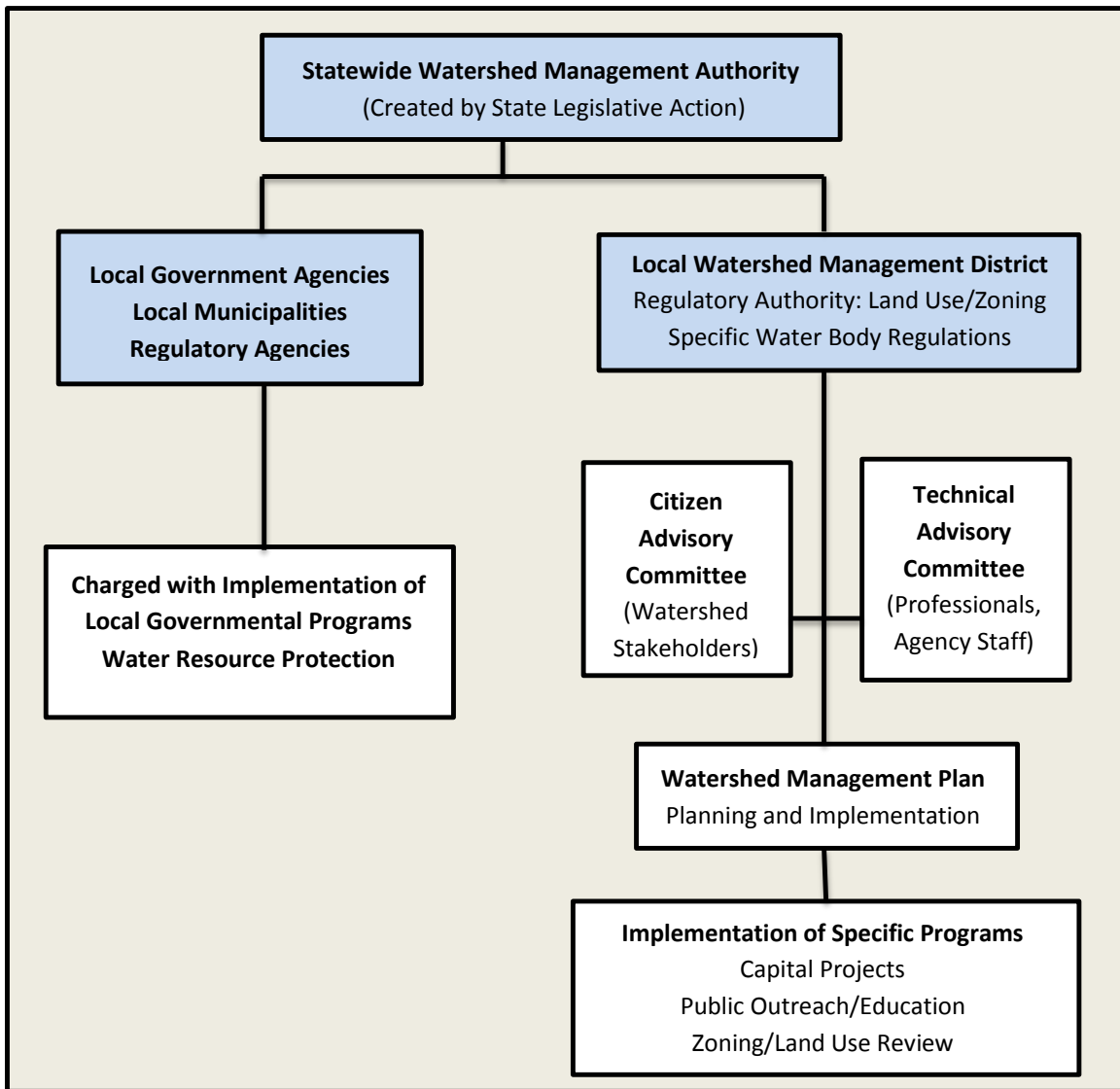
Co-management is “a process by which private and public actors cooperate, and share power, in order to solve problems related to natural resource management” (Carlsson and Sandstrom 2008, 36). The term connotes decision-making between the government and another actor that has a stake in the outcome (Plummer, *et al.* 2006). In practice, co-management involves multiple government departments and numerous local participants (Carlsson and Berkes 2005). Co-management is strongly rooted in property rights and environmental management. It emphasizes power-sharing as an influential outcome from the process of working together (Carlsson and Berkes 2005).

Collaborative approaches to environmental problem solving emphasize the deliberative nature of negotiation among stakeholders (Plummer and FitzGibbon 2004). This deliberation promotes information sharing among actors (Gerlak and Heikkila 2006). The processes tend to be long-term and aim to build lasting relationships among participants. The term collaborative will be used to frame this research because it fits the criteria for collaborative processes determined by Ansell and Gash (2007). Criteria include:

- Collaborative processes are initiated by an agency;
- Involve non-state actors;
- Are formally organized and meet collectively;
- Prioritize consensus decision-making;
- Include stakeholders in decision-making; and
- The focus of the collaborative body is public policy or management.

Collaboration is an umbrella term for a number of multi-actor arrangements, which might include stewardship groups, local management organizations, or business ventures. In order to differentiate types of collaborative governance arrangements, initiatives can be grouped by characteristics to better understand the subtleties within the broader concept of collaborative processes (Moore and Koontz 2003). One classification method distinguishes collaborative approaches by the actor who initiated the process into government-led, citizen-led and hybrid (Center for Watershed Protection 1998; Moore and Koontz 2003). Hybrid groups include members of local and/or regional governments and land managers, who make recommendations for government decision-making (Center for Watershed Protection 1998). Citizen-based groups often play an advocacy role in bringing issues to attention or taking steps within their capacity to improve local conditions. Government-based groups engage the public in an advisory or temporary capacity to better inform decision-making; see Figure 2.2 for the structure of a typical government-led collaboration in the United States.

**Figure 2.2 Structure of government-led collaborative approaches**



(Center for Watershed Protection 1998)

### 2.1.2 Government-led Collaborative Processes

Government-led collaborative processes are the focus of this research. In this type of process disagreements may result over what outcomes should be and whether the government perceives outcomes as ‘legally and administratively feasible’ (Robinson, *et al.* 2011). Locally based collaborative groups that are usually initiated by citizen groups tend to be able to implement outcomes more easily. This may be due to the direct link that members on the collaborative team have with their communities or the nature of the outcomes being voluntary action (Robinson, *et al.* 2011). Government-led and citizen-led collaborative processes vary in focus, decision-making structure and outcomes (Robinson, *et al.* 2011). Understanding the key aspects of government-led and policy based collaborative approaches is important because they have different methods of implementation and measures of effectiveness than other collaborative arrangements (Margerum



2008). However, there are multiple arrangements for collaborative decision-making even within government-led processes. Differences among government-led collaborative processes might include the complexity of the issue being addressed, capacity and history (Margerum 2008; Moore and Koontz 2003). Understanding the design features of collaborative groups and the differences between them will assist in determining an appropriate approach for the given problem.

Government-led collaborative approaches to decision-making are often used in situations where the issues are largely unknown, the issue is complex or the community is not organized (Center for Watershed Protection 1998; Moore and Koontz 2003). The decision to use a collaborative process for informing government is not politically neutral (Newell, *et al.* 2012). There are a number of reasons why government decides to initiate collaborative approaches to supplement decision-making, including informing contentious or complex policy issues. There are also political implications for collaborative processes that are initiated by government. Funding and implementation efforts of governments rise and fall based on the political party in office (Robinson, *et al.* 2011). Unstable funding and implementation efforts make it difficult for collaborative groups to function well.

There is often a “complex formal structure” that outlines how government-led collaborative groups form, make decisions and the scope of outcomes (Robinson, *et al.* 2011). If the role of the collaborative group closely mirrors the responsibilities of a government agency, then the complexity of decision-making may increase because there are multiple overlapping institutional structures that perform similar tasks (Biermann, *et al.* 2007; Meadowcroft 2007). The structure of government-led collaboration remains largely hierarchical as the government retains final decision-making authority. Government initiated collaborative bodies tend to operate within formal policy initiatives or legislation (Robinson, *et al.* 2011). In government-led collaborative processes a government representative tends to take on a lead role either consciously or unintentionally because they represent a legitimate body and are supplying resources (Provan and Kenis 2007). This may result in asymmetrical power relations within the collaborative body. The dominant roles that governments play in decision-making make it difficult for collaborative processes to steer into different or untried territories (Ananda and Proctor 2013). However, the role of government can be critical for fostering success in collaborative initiatives as their inclusion can facilitate distribution of resources and legitimacy for the process (Provan and Kenis 2007).

Government often focuses on organizational or policy types of collaborative approaches that operate at a higher administrative level and use policies and programs to effect change (Margerum 2008). This is in comparison to action-based collaborative approaches that usually create education plans, monitoring or restoration. Policy-level outcomes have broader scale significance and decisions will likely affect national, provincial or regional areas (Margerum 2008).

Policy-based collaborative groups normally attempt to create change by providing input to government that will create more integrative and representative policies and programs (Margerum 2008). Policy-based collaborative groups accomplish their goals through consensus for policies to improve the likelihood of efficient and effective implementation (Margerum 2008). By integrating multiple views into the policy, proponents argue, implementation will be improved

because the organizations that will be affected by the policy will have provided their input and support.

The implementation of outcomes from collaborative processes varies depending on the political climate, type of product the collaborative body is producing and goals and objectives of the initiative. Government-led implementation may change over time depending on the political appeal for action and available funding (Robinson, *et al.* 2011). Collaborative approaches to inform government decision-making are time consuming and often considerable time passes before the implementation phase begins (Robinson, *et al.* 2011). It can be difficult for government to amalgamate inputs from collaborative bodies into implementable decisions that also reflect government priorities and public concerns (Robinson, *et al.* 2011).

## **2.2 Theme 2: Outcome Evaluation and Protection**

### **2.2.1 Outcome Evaluation**

The challenge of identifying appropriate evaluation criteria for collaborative outcomes emerged in the 2000s and prompted debate about what should be measured and how to indicate ‘success’ (Koontz and Thomas 2006; McGuire 2006). The importance of measuring process and social outcomes and tangible and intangible outcome in collaborative initiatives had been used to judge success in collaboration for over a decade (Connick and Innes 2003). The focus on intangible outcomes, such as social capital and improved communication, has proliferated in the literature due to collaborative processes producing many intangible benefits that are often lost in formal evaluations (Conley and Moote 2003; Connick and Innes 2003; Rogers and Weber 2010).

Collaborative processes have a propensity to achieve ‘soft’ results that benefit individuals participating, but are not leveraged to the broader community or region (Newell, *et al.* 2012). It has also been suggested that process and social outcomes do not correlate to effective implementation or improved environmental conditions (Leach and Sabatier 2005; Mandarano and Paulsen 2011). Lubell and Leach (2005) postulate that “any social accomplishments are largely symbolic and transitory if they do not translate into resolving the underlying environmental problems and/or conflicts” (3). Direct measures of implementation are required to understand whether outcomes are being achieved, goals met, and outcomes protected. The current standard for understanding the success of collaborative processes is to evaluate the social, process and impact criteria (Mandarano 2008; Rogers and Weber 2010).

Collaborative processes have not met some proponents’ expectations in terms of their capacity to effectively solve challenging issues (Ananda and Proctor 2013; Newell, *et al.* 2012). However, it is also possible that collaborative processes are successful, but outcome evaluation may be unsuccessful (Lamie and Ball 2010). Stakeholders have identified successful components of collaboration even in cases that have not accomplished the overall aim of the collaborative process (Rudeen, *et al.* 2012). Measuring the outcomes of public actions is necessary to ensure accountability of the process (Hibbard and Lurie 2012). Without proving that goals have been met or tangible outcomes implemented it is impossible to determine the initiative’s success or advise on the use of collaborative processes for future decision-making.

A common difficulty for collaborative processes is determining indicators for success to understand whether outcomes are being achieved (Gerlak and Heikkila 2006). Despite the emphasis on indicators of success for collaborative processes a standard has not been established

to understand the progress or success of collaborative processes. This may reflect the differences in context, goals and participant inclusion specific to each collaborative process and the dilemma of measuring the short-term responsiveness of the environment to decision-making in an environment that reacts over the long term (Mandarano and Paulsen 2011).

### **2.2.2 Outcome Protection**

One of the main advantages of using collaborative approaches for informing government decision-making is the government's ability to receive a consensus from those affected by policy or program decisions (Margerum 2008). This is expected to create an environment that will facilitate easy implementation of the final policy or program. However, if participants believe that the final decision overlooked their input or they do not have power to determine or alter local conditions the policy or program may fail or take a long time to implement with large public criticism (de Loë and Kreutzwiser 2007; Richie, *et al.* 2012). As outlined in the previous section, understanding the social, process and impact of collaborative groups is essential to evaluating collaborative processes.

The social elements of evaluation include the benefits that members and society receive from the process. Stakeholder involvement contributes to plan quality (Benson, *et al.* 2014) and helps to build ownership of the outcomes (Blackstock, *et al.* 2012). Participants should be satisfied by the outcomes that were reached because their input should be reflected in final decisions. In order for participants to be satisfied with the process and outcomes they should feel that the process produced 'meaningful' results (Ansell and Gash 2007). In agreeing to participate in a collaborative process, stakeholders become responsible for the outcomes produced (Ansell and Gash 2007). Therefore, they must be satisfied with the outcomes if they are expected to have a role in seeing them achieved. If team members believe that the outcomes of a process will be unsatisfactory during deliberation they may drop out of the process believing it to be ineffective (Richie, *et al.* 2012). Participants usually volunteer their time and resources to take part in collaborative approaches to decision-making. Participants have expectations about what will be produced given their personal inputs (Ansell and Gash 2007). It is important to take steps to align member expectations with the mandate and capabilities of collaborative groups (Richie, *et al.* 2012). Engagement increases if there is correlation between participation and efficacy (Ansell and Gash 2007).

Process indicators measure whether the method of decision-making and deliberation was successful. One key attribute of ensuring that participants' ideas are incorporated into outcomes is supporting their views and opinions during deliberation (Ananda and Proctor 2013; Ansell and Gash 2007). It is important to ensure that stakeholders are integrated into active deliberation and have their opinions heard and discussed (Ansell and Gash 2007). If all stakeholders are not treated as equals they may feel disrespected and lose appreciation for the process and outcomes (Richie, *et al.* 2012).

Deliberation between state and non-state actors in collaborative settings is assumed to improve democratic participation; these processes include decision making through consensus, and building social capital through citizens' increased knowledge in issues and improved civic skills (Carr, *et al.* 2012; Mandarano and Paulsen 2011; Michels 2011). Furthermore, collaborative approaches provide the opportunity to better incorporate local and experience-based information,

which provides context. This public deliberation and local input creates support for outcomes and reduces resistance to implementation (Carr, *et al.* 2012; Michels 2011).

Government tends to supply the technical information that is the basis for collaborative decision-making. Government-led collaborative groups often require more evidence for validating conclusions to the public and can afford to gather extensive data (Robinson, *et al.* 2011). There is a misconception that science supporting policy choices is objective (Fischer 2005; Sarewitz 2004). Science can be biased or selectively chosen to support a particular policy outcome that is desirable to the government. Sarewitz (2004) also pointed to technical evidence being able to trump anecdotal evidence, which in collaborative processes could result in community opinions and observations being set aside in favour of measurable data.

Government-led collaborative processes often have broader impacts and it can be difficult to use local observations to inform larger scale decisions (Robinson, *et al.* 2011). If the final decisions are based solely on government-supported data, other members of the collaborative group might have little influence on final decisions (Watson, *et al.* 2009). Group conflict has resulted in collaborative processes that did not prioritize lived experiences and local observations (Robinson, *et al.* 2011). These conflicts can result in hurdles to implementation for the final plan created through collaborative group support (Robinson, *et al.* 2011). This is one situation whereby outcomes are not respected: if the government cannot implement the plan, then the opinions of members in the collaborative group will not be used to make change on-the-ground.

Impact is difficult to determine especially for environmental outcomes (Mandarano and Paulsen 2011). However, the literature on evaluating collaborative outcomes also emphasizes the importance of measuring implementation efforts (Blackstock, *et al.* 2012; Valve, *et al.* 2013). Implementation and impact measure different variables of success. Implementation determines whether decisions were put into effect, whereas measuring impact attempts to understand what affects resulted from decisions. Implementation is particularly important in understanding whether government includes outcomes from collaborative bodies in final decision-making. Many important elements of success that were identified in the literature, such as building social capital or increasing knowledge, are less important to stakeholders engaged in the process than ensuring effective implementation (Blackstock, *et al.* 2012). In terms of implementing the decisions from collaboration it may be easier to allow one actor to take charge, but this encourages other stakeholders to be passive toward the process (Clarke and Fuller 2011). Additionally, narrow stakeholder participation limits the ability of the group to confront mutual challenges (Richie, *et al.* 2012).

### **2.3 Theme 3: Institutions and Collaborative Processes**

Collaborative approaches continue to gain popularity for informing government decision-making. Therefore, it is essential to understand how collaborative processes are understood as formal and informal institutions and the degree to which they are changing the roles and responsibilities of conventional government. The institutional framework in Canada will help to clarify how collaborative processes inform government decision-making (Theme 1). Additionally, institutional aspects of collaborative approaches will inform appropriate outcome protection and evaluation (Theme 2).

In Canada, responsibilities for water are split between provincial and federal government as outlined in the Canadian Constitution Act. The provinces have greater responsibility in the

routine management of water resources and allocate certain responsibilities to local government or other resource management organizations (de Loë and Kreutzwiser 2007). The common-law doctrine of riparian rights forms the basis of access to water in Ontario. This specifies that people living on land with water should be able to access that water, but not hinder others from accessing water downstream (Johns and Rasmussen 2008).

The institutional structure of government in Canada was largely formed in the nineteenth century and it has become increasingly strained as contextual conditions change, including the social norms for decision-making (Johns and Rasmussen 2008; Ontario Ministry of Finance 2012). Institutions are “the humanly devised arrangements that guide the way people interact. They include the laws, customs, social conventions, regulations and rules that structure our behaviour” (Pagan 2009, 20). Good institutional structure involves “clear institutional objectives, connectedness between formal and informal institutions, adaptability, appropriateness of scale, and compliance capacity” (Pagan 2009, 21).

In order to alter the institutional structure in Canada to better reflect the present social and environment context institutional change is needed. Institutional change occurs when formal institutions deviate from informal institutions (Pagan 2009). Institutional change is “a shift in rules, monitoring, or enforcement procedures so that different behaviours are encouraged or constrained” (Imperial 1999, 460). Institutional change is a slow process partially due to the role of social acceptance that is required for new rules in organizing institutions (Pagan 2009). This reluctance to change leads to new political practices and norms being difficult to implement (Pagan 2009). In order for new institutional practices to have an effect the public must recognize and accept the change, new strategies should result and different, better results should be produced (Kiser and Ostrom 1982). Changes in institutions may not necessarily produce different outcomes (Kiser and Ostrom 1982). Furthermore, institutional structures can be highly functional, but fail to produce meaningful outcomes, or institutional structures can be dysfunctional and still provide meaningful outcomes (Ananda, *et al.* 2009).

Facilitating better opportunities for public input, especially through collaborative processes, is one institutional change that has slowly been ingrained in Canadian water governance. The degree of change that collaborative approaches to decision-making could potentially create in government decisions is debated in the literature. The potential role that collaborative approaches could play in shaping decision-making range between institutional transformation and merely a different consultation method that reinforces government control (Newell, *et al.* 2012; Watson, *et al.* 2009). In Canada, it is the general belief that the state will maintain a dominant role in central decision-making although the number of actors involved in decision-making will and has increased (de Loë and Kreutzwiser 2007). There is little disagreement that collaboration is increasingly being used as a method to inform government decision-making. Thus, determining the best balance between collaborative and government approaches is the present challenge (Heinmiller, *et al.* 2008).

Effective institutional design plays a key role in determining the success of watershed-based management (Imperial 1999) and collaborative processes (Ananda and Proctor 2013). For collaborative approaches to decision making “(i)nstitutional design refers ... to the basic protocols and ground rules for collaboration, which are critical for the procedural legitimacy of the collaborative process” (Ansell and Gash 2007, 555). Successful collaborative processes require clear goals, effective policy integration, and collective understanding of how the

collaborative body fits into the decision-making structure (Holman 2013). These criteria mirror the criteria for effective institutions outlined above. In order to accomplish objectives, the design of collaborative approaches requires a balance between vertical (federal or provincial) and horizontal (local) control (Imperial 1999).

The benefits and challenges of shifting to institutional structures that prioritize collaborative approaches need to be considered. One consideration is ensuring that decision-makers are accountable. Decision-making and implementation responsibilities are increasingly being carried out by local governments or non-governmental bodies (de Loë and Kreutzwiser 2007). In the UK (Watson, *et al.* 2009) and Australia (Australian Public Service Commission 2009) this localized responsibility has resulted in reduced government accountability. “Accountability refers to answerability to someone for appropriate conduct and expected performance ... [and] refers to the processes by which actors provide reasons for their actions against the backdrop of possible ... consequences” (Schillemans 2008, 177). Collaborative processes produce ‘horizontal’ accountability among peers that have equal standing as opposed to traditional ‘vertical’ accountability, which is gained through the hierarchy of central government and agencies (Schillemans 2008). In action-level collaborative processes accountability can be achieved through “self-enforcement and community norms” (Robinson, *et al.* 2011, 855). Government initiated collaborative bodies rely on traditional forms of accountability founded on government responsibility (Robinson, *et al.* 2011). This underscores the difficulty of governments implementing collaborative outcomes because the government must be accountable to the general public. The accountability and performance management mechanisms for conventional forms of government decision-making do not adequately represent new more deliberative forms of decision-making (Australian Public Service Commission 2009; Schillemans 2008).

Balancing conventional government tools and roles with relatively new participatory mechanisms is difficult because the managerial responsibilities and accountability of government to the public has been ingrained over time (Heinmiller, *et al.* 2008). Determining an appropriate scale to address challenges is one step to distribute the responsibility of government (Marshall 2008). Ananda *et al.* (2009) discuss that complex issues should be handled at higher administrative levels. However, this can be counterproductive to practice. A common practice in environmental management is downloading responsibilities to the lowest administrative level able to perform the task given their capacity, which is known as subsidiarity (Head 2008; Marshall 2008). Challenges remain for determining appropriate scales for various issues (Marshall 2008). For effective use of collaborative bodies in government institutions, governments must consider how collaboration enhances policy goals and benefits the public interest (Meadowcroft 2007).

## **2.4 Theme 4: The IAD Framework**

There are many available frameworks for understanding collaborative processes. Determining a suitable framework that addresses the research question and case study context is helpful for structuring research and determining findings. However, as Imperial (1999) notes “there is no consensus on definitions, concepts, or the methodological approach to studying the structure of interorganizational networks” (453). The lack of a clear methodological approach has led to the creation of multiple frameworks for investigating different aspects of collaborative processes. The IAD framework has been a helpful tool in understanding collaborative processes (Imperial 1999; Imperial and Yandle 2005) and will be used in this research. The IAD framework is best suited to

answer the research questions and represent the context of LWR in Ontario, but other frameworks were available including the two outlined below.

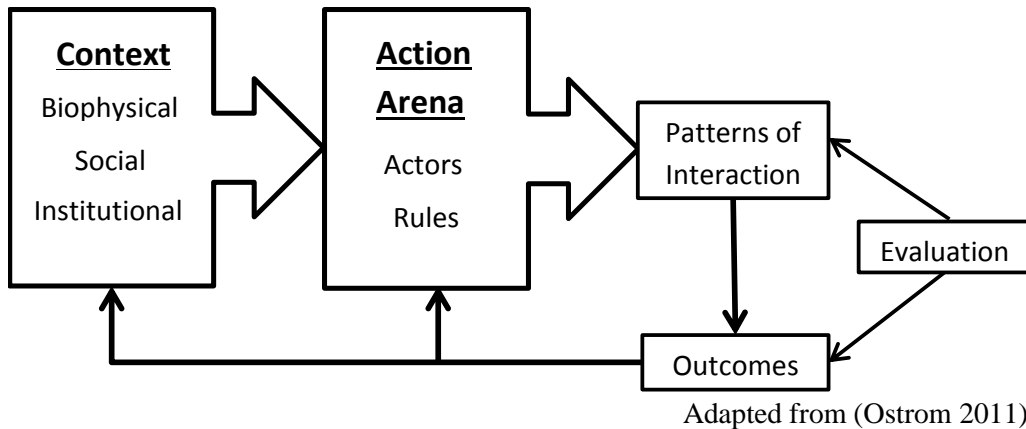
The governance principles discussed by Lockwood *et al.* (2009; 2010) could have been used to frame this research by comparing traits of good governance to the experiences of LWR in Ontario. Traits included elements like legitimacy, transparency, integration, fairness, etc. These indicators did not overview how government decision-making integrates input from collaborative groups, but rather focused on different levels of government decision-making. These criteria attempted to understand good governance practices. This is essential to government decisions that incorporate collaborative input, but is not the focus of this research.

The advocacy coalition framework was also a potential framework for this research. It centers on policy making and how actors with shared normative beliefs can work together to accomplish policy goals (Sabatier, *et al.* 2005). The advocacy coalition framework focuses locally to incorporate specific contextual elements and prioritizes the values of individuals. The advocacy coalition framework was not selected for this research because individual water users are more likely to act based on their needs than on a sense of shared values with other WRT members.

The IAD framework can be used to better understand the relationship between government and multi-actor groups and how outcomes are implemented. The IAD framework was created in the early 1980s by Kiser and Ostrom (1982) and has been refined and modified over the last 30 years (Ostrom 2005; Ostrom 2011). The framework is metatheoretical; it offers a number of propositions for assessment as opposed to investigating a single attribute of institutions, such as whether there is a positive impact from an institution. This allows a number of different types of institutions to be evaluated through the framework without biasing a particular arrangement. The IAD framework has two main components. First, it discusses the factors that influence decision-making and how outcomes impact these factors. Second, it highlights different political scales where decision-making occurs from the local management scale to the constitutional scale.

The first component of the IAD framework is composed of context, an action arena, patterns of interaction, outcomes and evaluation (Figure 2.3). Contextual variables include biophysical, social and institutional characteristics of the case study. Contextual characteristics impact the types of institutional design and outcomes that are appropriate (Imperial 1999; Ostrom 2005). They further influence how decisions are made by actors in the action arena and determine whether solutions will be an adequate fit for the contextual setting (Ostrom 2011).

**Figure 2.3: IAD Framework**



The action arena is delineated by rules that explain how decisions are made. The rules at this level determine the actors who can be involved, roles that different actors can perform, information that is available and the types of actions that are available (Ostrom 2011). See Table 2.1 for a list of rules. A rule is a “prescription that forbids, permits, or requires some action or outcome and the sanctions associated with failing to follow a rule” (Imperial 1999, 453, Table 1). Rules help to explain the choices that are made in decision-making and outcomes derived from those choices (Ostrom 2005). Altering rules results in actors using new strategies or behaviours, which can lead to different outcomes (Imperial 1999).

**Table 2.1: Rules That Define the Action Arena**

<b>Rules</b>	<b>Definition</b>
Position	Set of positions in participatory processes and how many participants hold each position.
Scope	Set of outcomes that may be affected and the external inducements and/or costs assigned to each of these outcomes.
Authority	Set of actions assigned to a position (i.e., the actions each participant is authorized to take).
Information	Channels of communication among participants and the language and form in which communication will take place.
Boundary	How participants are chosen to hold positions and how participants leave these positions.
Aggregation	Decision function(s) to be used at a particular decision points.
Payoff	How benefits and costs are to be distributed to participants in different positions.

(Cowie and Borrett 2005, 474)

The patterns of interaction highlight the relations among actors necessary for achieving potential outcomes. The patterns of interaction are dependent on the rules in the action arena. “Interactions are influenced by the explicit and implicit assumptions about the rules used to order relationships between individuals (or organizations)” (Imperial 1999, 454). The social context of the community also influences the pattern of interaction. The community dynamic and history of past interactions will dictate how actors form relationships with one another.



The framework also considers outcomes and various evaluation criteria. Over time the outcomes that are produced may influence the contextual variables and the action arena (Imperial 1999; Ostrom 2005). The outcomes will either fulfill or fall short of objectives. If outcomes do not ameliorate challenges, then the action arena may be altered to change decision-making in an attempt to improve outcomes. Evaluation criteria are normally used to judge if physical results are achieved or if the benefit to cost ratio is acceptable to the public and decision-makers (Ostrom 2005). There are a number of potential criteria that could be used to evaluate outcomes. Ostrom (2005; 2011) tends to highlight criteria that judge political, economic and social variables. Criteria that have been used to evaluate outcomes in the IAD framework including economic efficiency; equity; adaptability, resilience and robustness; accountability; conformance to general morality; and the need for trade-offs (Ostrom 2005).

The second component of the IAD framework incorporates different ‘levels’ of decision-making. There are three levels where decision-making occurs: 1) constitutional choice-level, 2) collective choice-level and 3) operational choice-level. The constitutional level refers to the “constitution governing the legislature” (Ananda, *et al.* 2009, 309). It refers to who has the jurisdiction to take action on an issue. This level impacts outcomes by determining who is eligible to participate and how they participate. The collective level represents decisions that “are made by officials to determine, enforce, continue, or alter actions authorized within institutional arrangements” (Kiser and Ostrom 1982, 208). The operational level represents actions taken in the physical world by individuals (Hardy and Koontz 2009). Each level influences the decision-making structure at the other levels. The IAD framework as depicted in Figure 2.2 is present at each level. The outcomes of the constitutional and collective levels are often rules that determine decision-making in subsequent levels.

#### **2.4.1 Evolution of the IAD Framework**

The IAD framework is beneficial for understanding how institutional arrangements affect environmental management processes and outcomes (Imperial and Yandle 2005; Koontz 2005). Political economy was the field where the IAD framework was created and it has been borrowed by collaborative environmental scholars (Ostrom 2005). “Understanding the complex set of transformation that link institutional arrangements to individual behaviour and aggregate results occurring in the ‘real’ world” was the original purpose of the framework (Kiser and Ostrom 1982, 180). The IAD framework is continually evolving to suit institutional designs and emerging challenges.

Scholars in environmental management (Ananda and Proctor 2013; Imperial and Yandle 2005) and collaborative governance (Ananda and Proctor 2013; Gerlak and Heikkila 2006; Koontz 2005) have borrowed the IAD framework to better understand institutional arrangement and performance. Mark Imperial (1999) revealed the merit of using the IAD framework to understand collaborative processes in institutional settings (Gerlak and Heikkila 2006). He found the IAD framework is helpful for analyzing environmental management institutions because it:

- Includes a spectrum of transaction costs associated with policy implementation;
- Considers contextual settings; and
- Does not favour one type of institutional arrangement over another (Imperial 1999).

This last point is essential for comparing different types of environmental management institutions, such as community development, collaborative processes and conventional government hierarchical arrangements. This comparison is made possible by the focus on rule-structured interactions (Imperial 1999).

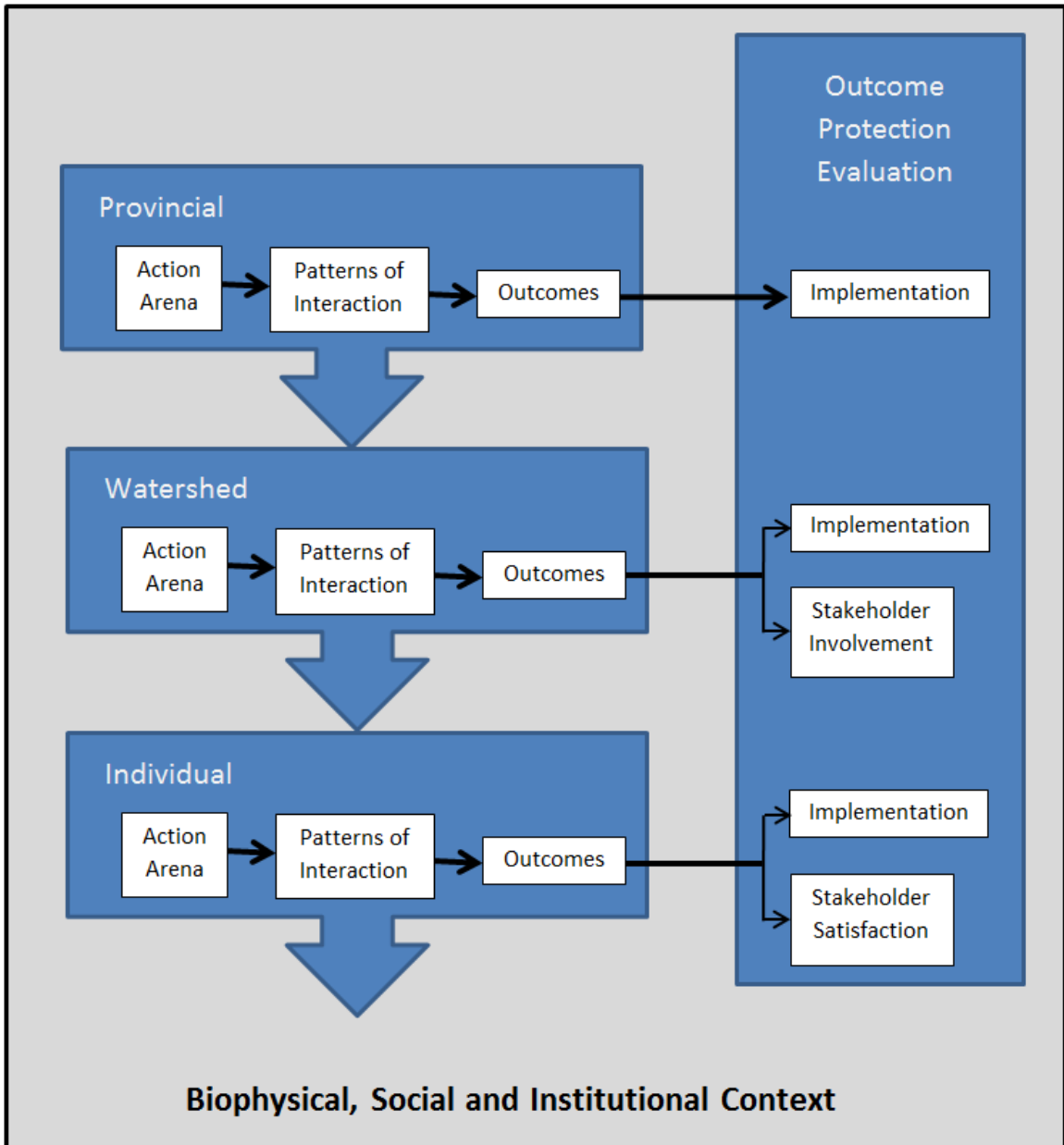
The framework has been adapted to study collaborative environmental management and governance institutions. There have been three major adaptations. First, the constitutional level is not defined strictly as the constitutional laws of a state, but rather as the policy that enables the collaborative process and its objectives (Gerlak and Heikkila 2006). A definition for the constitutional level incorporates governance aspects, institutional arrangement and sets the rules for decision-making at the collective choice level. The constitutional level of analysis for collaborative processes can also reflect diverse arrangements from regional governance to inter-state actors, instead of only the highest level of government (Cowie and Borrett 2005). Second, the collective level in government-led collaborative arrangements establishes management plans and policy making through collaborative processes. At this level participants deliberate and determine outcomes to be implemented at the operational level. Third, the actors in the operational level are often characterized as resource users as opposed to individuals. It is also the level where final outcomes are implemented and monitored (Gerlak and Heikkila 2006).

Authors who use the IAD framework to understand environmental management and collaborative processes tend to focus on one or a few elements of the framework (Cowie and Borrett 2005; Gerlak and Heikkila 2006; Imperial and Yandle 2005; Koontz 2005). The main analysis occurs between levels (constitutional, collective and operation) of collaborative decision-making (Cowie and Borrett 2005; Gerlak and Heikkila 2006) or focuses on one level to determine key attributes, structures and processes of decision-making or implementation (Imperial and Yandle 2005; Koontz 2005). Furthermore, relevant rules can be selected as the focus of analysis while others can be ignored if they are not relevant (Ostrom 2005).

## **2.5 Conceptual Framework**

The IAD framework provided the general structure for the conceptual framework depicted in Figure 2.4. The three levels of analysis (Provincial, Watershed and Individual) mirror the typical levels that are impacted in government-led collaborative approaches for environmental decision-making in Canada. The action arena, patterns of interaction and outcomes are also directly from the IAD Framework. As discussed in Theme 2 taking into consideration multiple types of outcomes is important for collaborative approaches. Implementation represents the tangible based indicators for determining if outcomes are protected by government. Investigating actor involvement in the collaborative process will underscore whether opinions other than government informed the collaborative outcomes. Stakeholder satisfaction outlines the social element of evaluation and whether participants thought the collaborative process was worthwhile and resulted in beneficial outcomes for their communities of practice.

Figure 2.4: Conceptual Framework



## Chapter 3

### Methods

This chapter outlines the research methodology and the methods used for collecting and analyzing data. First, the qualitative, multi-case study research approach is discussed. This includes the rationale for using a case study approach and the selection criteria for determining appropriate case study locations. Subsequently, an overview of the research design is presented, including data collection methods and data sources. Finally, this section includes an outline of the data analysis procedures, which were structured by the conceptual framework to support findings.

#### 3.1 Research Approach

A qualitative approach to gathering data was used in this research. Qualitative analysis is useful for understanding interviewees' views on issues, while still accounting for researcher bias and allowing for attentiveness to interviewee perspectives – something that is essential for truthful findings (Bazeley 2013). The key instrument for qualitative data analysis is the researcher herself. This requires open mindedness to unanticipated findings and being cautious of conclusions early in the process (Bazeley 2013).

The dependence on the researcher in qualitative studies has roused suspicions as to the rigour involved and the ability to replicate findings. However, qualitative methods provide the foundation for exploring 'real world' issues outside of the laboratory, including issues that cannot be controlled and that are intertwined with human behaviour, prior experiences, and perceived constructs (Gray 2004). Qualitative data are well grounded, capable of illuminating cause and effect, and well-suited for representing temporal and spatial characteristics (Bazeley 2013). These beneficial attributes provide strong support for the use of case study method to investigate LWR in Ontario.

A case study is "an empirical inquiry about a contemporary phenomenon (e.g., a "case"), set within its real-world context especially when the boundaries between phenomenon and context are not clearly evident" (Yin 2009, 18). Case studies are effective for explanatory and descriptive research (Yin 2012). Descriptive research explores 'how' and 'why' questions (Miles, *et al.* 2014). This research is largely descriptive because it investigates how decisions from WRTs are incorporated into government decision-making and why outcomes are or are not protected by government in collaborative initiatives.

Multi-case study approaches investigate cases that are similar whereas single case studies focus on a target case supplemented by information gathered from other contexts (Stake 2006). Multiple case studies allow for replication to understand if similar relationships exist in different areas and to verify if findings are reliable or dependent on context by comparing and contrasting case results (Yin 2009). Observing the local context and connection with actors involved in programs provides richer and deeper insight into the case. A multi-case study was used to investigate the role of WRTs in LWR because the context in each conservation authority was similar biophysically, socially and institutionally. The case study approach contributed to this research by validating theoretical work on how collaboratively reached decisions are used by government and whether outcomes are protected by governments in collaborative processes.

## **3.2 Case Study Selection**

The LWR program is an example of a collaborative decision-making process because it fits the criteria discussed by Ansell and Gash (2007), which were outlined in Chapter 2. The WRTs were created through government agencies, are formally organized and meet collectively. The WRTs are included in local decision-making for LWR and are composed of multiple types of actors including non-state actors, such as agricultural or aggregate representatives. The focus of the WRTs is managing water resources and the LWR program prioritizes consensus decision-making.

Ontario LWR was selected as a research topic over other collaborative processes in Ontario because it fulfilled the following criteria:

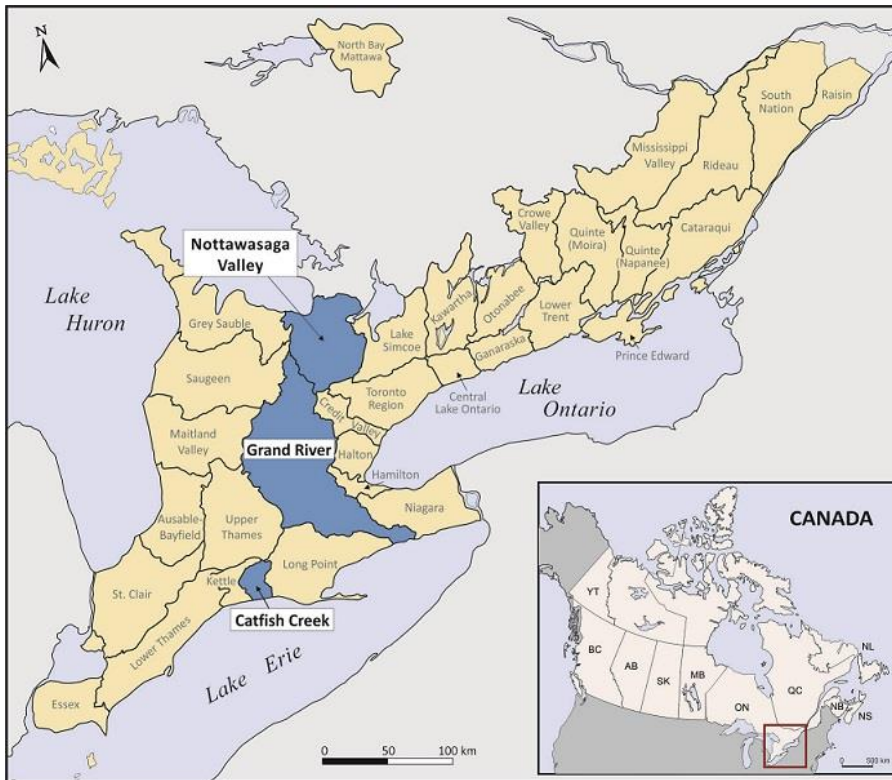
- A government-led collaborative initiative as defined by the Center for Watershed Protection (1998). Selecting a government-led initiative is necessary for understanding whether the government is protecting outcomes from collaborative processes they initiate.
- A collaborative process that has completed the expected outcomes for government.
- A collaborative approach that has been established for at least ten years to understand how over time the relationship between government and the collaborative body has formed and whether outcomes have been protected.

The criteria for determining the case studies within LWR are discussed in the next section.

## **3.3 LWR Case Studies' Locations**

A multi-case study approach was used to collect data from LWR in Ontario. Case studies should be relevant to the research question, represent diversity in context and provide the ability to investigate complexity and context (Stake 2006). Cases in this research were spatially bound by conservation authority boundaries (see Figure 3.1) and temporally bound from 2001 (the release of the first LWR program document) to the present. Conclusions from cases reflect how WRT decisions were incorporated into government decision-making and whether the outcomes from LWR were respected. Three case study areas representing WRTs were selected to represent collaborative approaches to decision-making for LWR through a descriptive, multi-case study approach.

**Figure 3.1: Conservation Authority Boundaries and Case Study Locations**



Source: Adapted from MNR (1987 and 1992).

Case study locations were selected based on whether the watershed had experienced conditions that warranted a Level 3 designation. A preliminary scan of press releases in each conservation authority and Conservation Ontario data revealed ten WRTs that had experienced Level 3 conditions in their watershed. Case studies were prioritized based on being located in southern Ontario, special status in the LWR program, such as a pilot project happening within the watershed, and diverse spatial and water-use characteristics. The rationale for case study selection is presented in Table 3.1. A detailed overview of the biophysical, social and institutional factors for each case study is presented in Chapter 4, Section 3. The focus for this case study was southern Ontario. Watersheds within eastern and northern Ontario face different challenges than southern Ontario and have different water use characteristics. The MOE has five regional offices to coordinate local programs. The boundaries of the West Central Region and Southwestern Regions provided the boundaries for case study locations capturing the experiences in Southern Ontario.

**Table 3.1: Characterization of Case Studies**

Case Study	Water Use and Projects
Catfish Creek Watershed	<ul style="list-style-type: none"> <li>• Southwestern Region.</li> <li>• Most land use is agriculture based.</li> <li>• Area where tobacco is grown, which is a water intensive crop.</li> <li>• Large number of irrigation ponds present in watershed.</li> <li>• Faced Level 3 indicators in 2007, but did not recommend declaring Level 3.</li> </ul>
Nottawasaga Valley Watershed	<ul style="list-style-type: none"> <li>• Southwestern Region.</li> <li>• Agriculture dominates land use.</li> <li>• Active aggregate industry.</li> <li>• Pilot project site for Level 3 funded by Ministry of Natural Resources (MNR).</li> <li>• Faced Level 3 indicators in 2007 and recommended declaring Level 3.</li> </ul>
Grand River Watershed	<ul style="list-style-type: none"> <li>• West Central Region.</li> <li>• Crop irrigation is high in the southern end of watershed.</li> <li>• Aggregate dewatering, golf courses, aquaculture and water bottling dominate commercial use.</li> <li>• Pilot project site for Level 3 funded by MNR.</li> <li>• Faced Level 3 indicators in 2007 and 2012, but only recommended declaring Level 3 in 2007.</li> </ul>

### 3.4 Data Collection

Data triangulation is important for verifying findings in qualitative studies (Yin 2009). This requires multiple data sources to support findings. This research used key informant interviews, document analysis and personal observations to collect data. Key informant interviews were essential for gathering the opinions of interviewees in LWR to understand whether outcomes are protected and if participants are satisfied with their engagement. Document review provided contextual information and the structure of LWR as detailed in policy frameworks and legal documents. Meeting minutes and press releases further highlighted the experiences in and outcomes from LWR. Finally, personal observations were used to cross-check findings from document analysis and interviews.

#### 3.4.1 Document analysis

In total, 72 documents were coded. Documents released by provincial government departments, municipalities, non-government organizations and conservation authorities were included for assessment. Conservation authority websites and provincial agency websites were scrutinized for applicable documents. The policies that informed LWR, including the Ontario Water Resources Act and its regulations, LWR policy documents, PTTW guiding documents and educational materials (21) were foundational documents for analysis. Municipal bylaws and other relevant materials (4) were used to understand the actions of municipalities. Documents by non-

governmental organizations (3) operating at the provincial level provided critiques of the LWR program. Conservation authority documents (15) outlined operational procedures and conservation authorities' perspectives of the LWR program. Conservation authority correspondence (4) to LWR partners was also included for analysis. Meeting minutes (16) from WRTs provided an overview of the structure of meetings, how participants contributed and what was discussed. Newspapers and other media sources were investigated using key search terms, such as Ontario Low Water Response, Level 3, etc. Media sources (9) provided a source for assessing implementation and reported on some of the challenges of declaring Level 3. Finally, interviewees were asked during interviews if they were aware of any documents that would benefit the research and those were added for analysis.

### **3.4.2 Interviews**

Interviews allow people to explain their experiences and perspectives and allow the researcher to consider new questions as themes and ideas emerge from interviews (Van den Hoonaard 2012). Questions were derived from the conceptual framework to understand the relationships between different actors and whether participants were satisfied by outcomes, implementation and their role in the process. The rules from the action arena in the IAD framework helped to shape questions that investigated how decisions were made and how outcomes from the WRTs were incorporated into government decision-making. Evaluation criteria for outcome protection were determined by asking interviewees about their experiences with LWR and implementation, inclusion in decision-making, and satisfaction with outcomes. See Appendix 1 for a list of interview questions.

Interviews were arranged in each WRT with interviewees who represented different sectors. This provided a varied perspective on the relationships that form between government and the collaborative body and different views on whether the government is protecting outcomes. Government officials from the MOE (2), MNR (1), and Ontario Ministry of Agriculture and Food (OMAF) (2) also were interviewed to understand the provincial government view, perspectives on the collaborative process undertaken by WRTs, and reasons why Level 3 has not been declared. Provincial government participants are often members of multiple WRTs. Therefore, the people interviewed were not treated as members of each individual case study. An interview was also arranged with a non-governmental organization at the provincial scale to understand a broader perspective of LWR that is not connected to government decision-making. Local conservation authority staff (5) were interviewed to understand how WRTs are formed and how members interact. Municipal officials (4) were interviewed to understand local government's role in WRTs. All together 22 people were interviewed out of 37 who were contact to take part in this research; see Table 3.2 for how interviewees were divided among case studies.



**Table 3.2: Interviewees by Case Study**

<b>Case Study</b>	<b>Interviewee</b>
Catfish Creek watershed	5
Nottawasaga Valley watershed	6
Grand River watershed	5
Provincial Government or non-government	6
Total	22

Clearance from the University of Waterloo Research Ethics Board was obtained prior to interviews. The conservation authority representative for LWR in case study locations was contacted to inform them about the project and benefits and risks of being included in the research. E-mail addresses for the WRT members were gathered from the internet or supplied by conservation authority staff; in some cases conservation authority staff facilitated access to WRT members. Additionally, a snowball method was used for gathering interview candidates by asking for additional contacts from interviewees. Potential interview candidates received an e-mail outlining the research, ethics clearance and their participation. In-person interviews (16) or telephone interviews (6) were arranged that lasted twenty minutes to two hours. There were 12 individual interviews, two interviews with a pair of interviewees, and two interviews where three people were interviewed together. The interviews were audio recorded with the permission of the interviewees and transcribed. One interviewee declined to have the interview audio recorded. Transcriptions were returned to the interviewees for verification of their accuracy, to clarify any points that were made, and to add information that was not discussed during the interview.

### **3.4.3 Personal observation**

Personal observations are based on recording experiences through what was sensed, heard and seen while conducting research, and then weaving a narrative based on the observations (Yin 2012). An obstacle to observational methods is gaining access to the research setting (Gray 2004). As recommended by Gray (2004) it is helpful to find a ‘gatekeeper’ who can assist the researcher to access the research setting. In this case it was helpful to build on relationships that were garnered between LWR committees and my advisor and his past students as well as colleagues who work in LWR.

To gather personal observations I visited locations of importance for LWR and noted observations during interviews. Observations took place between September 2013 and March 2014. Notes included the date, location, those in attendance and the contextual characteristics of observations. Observations took place while on an irrigation tour officially organized by the NVCA, an impromptu tour of water users’ irrigation systems in Catfish Creek watershed, a tour of the MNR Surface Water Monitoring Centre in Peterborough, and during a workshop organized by Farm and Food Care Ontario about water conservation projects. It was my intention to attend WRT meetings to observe the relational dynamics among actors at meetings first hand, but data collection occurred during summer 2013 to spring 2014, a wet year for most of Ontario. As a result, no LWR meetings took place during the study period. However, interviewees discussed the atmosphere in meeting from 2012 – a dry summer, which supplemented not being able to attend meetings firsthand.

### 3.5 Data Analysis

How government uses the outcomes from collaborative approaches to decision-making and the extent governments are protecting collaborative outcomes were addressed by this research. Studying the relationship between government and collaborative processes simultaneously with the mechanisms for protecting outcomes is essential. This approach helped to solidify the connections between process, outcome and evaluation, which provided richer analysis into the case of LWR. The conceptual framework outlined in Chapter 2 (Figure 2.4) was used to structure data analysis.

To apply the conceptual framework to LWR the biophysical, social and institutional context was determined for each case study. The action area is composed of the actors involved in decision-making and the rules that govern their choices and behaviour. Actors who are involved in LWR include provincial government, conservation authority staff, municipal government, local water users and special interests, such as recreation. For the purposes of this study the three levels of analysis Provincial, Watershed and Individual (Constitutional, Collective and Operational, respectively) provided the major focus as they reflect the LWR context.

The types of measures typically used for evaluation in the IAD framework, such as economic efficiency, equity and adaptability would not answer the questions this research is asking. These are necessary measures to understand if decisions were effective, but the challenge is that collaborative outcomes are not used for final decision-making. If decision are not used it is impossible to assess if inputs would have been effective. Therefore, focusing on indicators for understanding if government protects outcomes is essential. Implementation will be a key indicator to understand the government's final decision and whether it included input from the collaborative group.

This research mirrors the work of Gerlak and Heikkila (2006) in using implementation as a key indicator to evaluate the outcomes for collaborative arrangements. Participant engagement and satisfaction were also used as indicators for assessing if stakeholders felt that their opinions were incorporated into decision-making and if they felt the outcomes were valuable. These two indicators attempt to understand whether actors' opinions are incorporated into collaborative outcomes and if outcomes are producing benefits in actors' communities of practice. As outlined in the conceptual framework, investigating these three indicators will provide insight into the social, process and impact outcomes.

The early stages of analysis began with transcribing interviews, typing up personal observations and field notes, and collecting documents. Throughout this process and during analysis the use of personal memos for exploring preliminary ideas was an essential step. Memos help the researcher understand concepts, link data to theoretical concepts, track thinking over time and helps findings materialize (Van den Hoonaard 2012). Notes during the data collection and analysis processes were recorded in a Word document and catalogued by date. The memos consisted of primary data I was reviewing, sources from the broad literature that might discuss similar themes and emerging ideas.

Organizing the different sources of data was the next step in analysis. NVivo 10 software was used to collect data in one location, group similar themes through codes, explore relationships and support findings. NVivo is a qualitative data analysis tool that assists researchers by creating viable and replicable results, query data and visualize findings. Using

software, such as NVivo, for analysis increases the potential of limiting the scope and reducing flexibility in analysis (Van den Hoonaard 2012). However, ensuring that new codes can be created to capture emerging themes is one way to ensure broad scope and flexibility; another way is to revisit coded material for accuracy and relevance.

Two cycles of coding were undertaken to ensure material was properly represented. The first coding process used Structural Coding Method to group data into themes. Structural coding “applies a content-based or conceptual phase representing a topic of inquiry to a segment of data that relates to a specific research question” (Saldaña 2009, 66). The conceptual framework guided the creation of codes. A ‘grandparent’ code separated the Provincial, Watershed and Individual levels. ‘Parent’ codes under each level were used for action arena, Patterns of Interaction, Outcomes, and Outcome Protection Evaluation. A ‘child’ node was used to represent each of the rules in the action arena code. As previously discussed it is essential to ensure that emerging and unexpected themes are included. Therefore, as coding took place new parent and child nodes were created. To separate material pertaining to case study locations, documents, observations and interview transcripts had a source code applied that tracked what case study (Catfish Creek, Nottawasaga Valley or Grand River) the data corresponded to. This made it possible to understand case material and compare data between cases.

The second cycle of coding was used for fact checking and refining emerging codes. The material in each code was reviewed to assess whether it fit the description in the code book – a document outlining the definition of each code, what was included or excluded and examples. If material reflected the description of the code it remained coded, but otherwise it was removed. If the data appeared important, but still did not fit in the code, a new code was created or it was moved to another more suitable code. For codes that held a large amount of information the material was reviewed to understand if themes existed. If there were groupings of different themes child nodes were created. For example the code ‘challenges’ had ‘administrative’ and ‘physical’ child codes created after reviewing the code.

Evaluating the data was the final stage of analysis. This case study design is predominantly descriptive, which largely does not use ranking or sliding scales to qualify results (Miles, *et al.* 2014). Comparing case studies’ experiences provided the basis for analysis. The experiences of each case study at the watershed and individual levels were reported as well as how outcomes were protected through implementation and participant inclusion and satisfaction. The provincial level was not separated into case studies because findings were similar for each case study and provincial participants were present on more than one WRT making it difficult to attribute their perspectives to one WRTs experience. Matrix coding was used to compare the information in codes between case studies and to understand if there were differences of opinion within case studies. Matrix coding uses a table to list data that has been assigned two codes; in this case one code related to the case study watershed. A descriptive comparison of the official LRW program and participants’ experiences was used to understand how government incorporates collaborative outcomes into final decisions. Outcome protection was evaluated through implementation and participant engagement and satisfaction. Implementation reported on the specific steps necessary to designate Level 3, including documentation of water conservation; evidence of social, economic and environmental impact; and developing a prioritization of use. The views that emerged in the data were collected, synthesized and reported. The degree outcomes are protected by government were assessed for each case study by addressing similarities and differences in opinion concerning whether outcomes were protected.

## Chapter 4

### Contextual Setting

Chapter 4 provides an overview of the LWR program and uses the IAD framework to characterize the decision-making process. The PTTW program in Ontario is also outlined, including how it contributes to LWR. I then characterize the contextual setting of Catfish Creek watershed, Nottawasaga Valley watershed and Grand River watershed. The factors discussed include biophysical, social and institutional factors for each case study.

#### 4.1 Low Water Response Program

The term ‘drought’ is used in multiple contexts with varying definitions. Using contextual definitions is helpful because the indicators of drought vary by individual, spatially and temporally (Passioura 2007). In general drought is less than average rainfall over a long period of time. Drought is defined by the LWR program as:

(w)eather and low water conditions characterized by ... below normal precipitation for an extended period of time ... streamflows are at the minimum required to sustain aquatic life while meeting only high priority demands for water ... (and/or) socioeconomic effects occurring on individual properties and extending to larger areas of a watershed or beyond (Ontario Ministry of Natural Resources, *et al.* 2010, 6).

Drought can be disastrous for economic sectors that depend on a steady supply of quality water, and can negatively impact the health and wellbeing of communities facing the consequences of drought conditions. Prolonged drought or low water conditions can also adversely impact the ecological functioning of aquatic and terrestrial ecosystems. Historical instances of dry weather in Ontario that led to low water conditions or drought occurred approximately every ten to fifteen years (Ontario Ministry of Natural Resources, *et al.* 2010). However, with increasing rates of water use and the impacts of climate change on low water conditions, droughts are expected to become more frequent and severe (Ontario Ministry of Natural Resources, *et al.* 2010). In the late 1990s, Ontario experienced intensive low water conditions. In 2001, a provincial review of this low water episode led to the creation of the *Ontario Low Water Response* plan to ensure provincial support and preparedness during extended low water conditions (Ontario Ministry of Natural Resources, *et al.* 2010).

Existing legislation, data collection networks and relationships among provincial government, local government and conservation authorities are used to deliver the LWR program. The purpose of LWR is to ameliorate the impact of low water conditions, but it does not address emergency management or long term planning. WRTs, based on conservation authority boundaries, respond to current water situations rather than long-term projections, which remain the responsibility of designated agencies. WRTs consist of local water users representing a diversity of sectors that take water, municipal government, conservation authorities and provincial government representatives from MOE, MNR, OMAF and other departments depending on local contextual characteristics. Conservation authority staff act as one of the co-chairs on the WRT. Provincial representatives fulfill an advisory role and are non-voting. WRT members share observations and data, communicate WRT decisions with their sector and

implement drought management tools (Ontario Ministry of Natural Resources, *et al.* 2010). WRTs are responsible for declaring Level 1 and 2, reacting to short-term low water conditions, and coordinating a local response.

The MNR is designated the lead agency for Low Water and Drought Management under the *Emergency Management and Civil Protection Act*. MNR funds LWR and is responsible for altering the program as required. LWR mechanisms are triggered when low water conditions are present. Low water conditions are designated through thresholds for precipitation and stream flow (Ontario Ministry of Natural Resources, *et al.* 2010). MNR collects and analyzes stream flow and precipitation data and works with conservation authorities to determine low water conditions in local areas.

There are three classes of water taking specified in the LWR program: essential, important and non-essential. These classifications allow for a prioritization of use during periods of low water or drought. Essential uses include personal household use (such as water for drinking and sanitation), firefighting and water for livestock. These uses of water must be guaranteed access to supply in order to maintain quality of life and to reduce the impacts of low water. Important uses encompass social and economic uses of water. This category contains the industrial, commercial and agricultural uses that contribute to economic growth and social wellbeing. Determining priorities for use is the most difficult in this category. Non-essential uses can refrain from using water for short time periods with little detrimental effect. This category includes aesthetic or luxury usages (household conservation, car washing, lawn watering, etc.). There are usually municipal bylaws that oversee these uses.

There are three levels of LWR (Ontario Ministry of Natural Resources, *et al.* 2010):

- Level 1 is declared if precipitation is less than 80% of the three or eighteen month averages or if monthly spring stream flow is below the lowest average summer measurement for that monitoring station. A Level 1 declaration initiates voluntary water reduction by 10%.
- A Level 2 can only occur if a Level 1 has already been designated for that area. Level 2 is triggered when the average precipitation is less than 60% of the one, three or eighteen month averages, if precipitation is less than 7.6 mm of rain a week or if monthly spring or summer flow is between 50-70% of the average. A Level 2 designation initiates voluntary water conservation of 20% and restrictions can occur for non-essential uses. Restrictions occur through municipal bylaws enforcement, which can be initiated during any level of concern.
- A Level 3 can only be designated once a Level 2 has been confirmed. Level 3 continues to use conservation and restriction to reduce the pace of water taking, but it also uses regulation through the PTTW to restrict water taking following the recommendations of the WRT. A Level 3 can be called when one, three or eighteen month average precipitation levels have fallen below 40% of the average or if steam flow is less than 50% of average monthly flow. In addition, in order for a Level 3 to be designated there needs to be:
  - Evidence of conservation in Level 1 and 2;
  - Documentation of socio-economic and ecologically adverse impacts from low water conditions; and

- A recommendation from the WRT for priorities to restrict water taking.

Once Level 3 is designated, control of LWR reverts to government authority. The OWDC is responsible for determining whether a watershed has met the requirements for declaring a Level 3. The OWDC formed the Low Water Committee to liaise with teams once they have declared a Level 2. The Low Water Committee has representation of field and water Directors from MOE, MNR, OMAF, and Ministry of Municipal Affairs and Housing. Once a watershed or subwatershed enters Level 2, provincial field directors from the affected watershed also sit on the committee. The Low Water Committee is responsible for reviewing the documents submitted in support of issuing a Level 3 and advice from provincial field representatives to determine whether to designate Level 3.

A Level 3 designation has never been declared despite evidence that on-the-ground conditions met requirements for such a designation, and the fact that water systems have reached critical drought conditions (Environmental Commissioner of Ontario 2012b). If a Level 3 is not designated the restrictions suggested by the WRT are not implemented. This circumvents the obligations of the MOE to limit water taking during a Level 3 and undermines the LWR program by failing to adhere to the rules outlining the conditions for a Level 3 and the associated actions.

## 4.2 Permit to Take Water

Ontario regulations for water taking began in 1961 when the *Ontario Water Resources Commission Act* was amended (Conservation Ontario 2003). The PTTW is regulated through the *Ontario Water Resources Act* and allocates permits for water taking for users who withdraw more than 50,000 litres per day (Ontario Ministry of Natural Resources, *et al.* 2010). The permitting system is supposed to “achieve environmental objectives ... minimize water supply and water quality interference problems and to provide for the settlement of interference complaints” (Ontario Ministry of the Environment 2005, 2). The MOE is responsible for administering the PTTW. The number of permits that are allocated to water sources and the permitted withdrawal volume of these permits will have implications during low water periods. Conflict may arise if a water source can no longer support the allotment of water or if the health of the aquatic ecosystem is in question. The PTTW is the mechanism that ensures responsible withdrawal of water during normal or more than average water levels. The LWR program is responsible for ameliorating detrimental impacts of low water. The LWR program depends on the PTTW process as a tool for reducing water use during times of low water.

Each application that is submitted by a water user for a PTTW is examined on a case-by-case basis (Ontario Ministry of the Environment 2005). Permits are required for agricultural purposes, municipal withdrawals, commercial and industrial processes and recreational uses that use more than 50,000 L/day. Water use for firefighting, watering livestock (when water is not stored) and household uses does not require a permit. One of the key considerations that a Director contemplates while evaluating a permit application is the need to protect the functions of ecosystems and to ensure that other water taking activities are not interfered with by new permitted water uses. Low water conditions impinge on the ability of water users to withdraw water. Permits have conditions in place for withdrawals in times of low water. Permit holders are required to monitor their water taking volumes/day. The Director can refuse to grant a permit, or can impose conditions on permits in watersheds that have had a higher frequency of low water

events. The Director’s decision can reflect the recommendations of the WRT in the watershed (Ontario Ministry of the Environment 2005).

When an application for a PTTW is evaluated the Director takes into consideration water availability of the source, including present uses and the extent of taking for the source of water, sustainable yield and low water; the natural functioning in the surrounding ecosystem, including flow, effect on habitat and interactions between surface and groundwater sources; and the reason the water is being withdrawn (Ontario Ministry of the Environment 2005). Applications for water uses that have a higher risk of causing adverse impacts will go through a more intensive evaluation process. High risk permits may be granted for a shorter duration. The length of time for which a permit is granted depends on environmental risks involved with the permit. Permits are not issued for more than ten years.

### 4.3 Contextual setting for case study locations

The biophysical, social and institutional factors were investigated to understand the contextual settings. These three factors are identified in the IAD framework as essential for understanding the context where decision-making occurs.

#### 4.3.1 Biophysical characteristics

The biophysical characteristics of the three case study location include the traits of the physical environment or ecosystem elements that impact water level conditions.

**Table 4.1: Biophysical Characteristics by Case Study**

	<b>Catfish Creek</b>	<b>Nottawasaga Valley</b>	<b>Grand River</b>
<b>Area</b>	• 490 km <sup>2</sup>	• 3,146 km <sup>2</sup>	• 6,800 km <sup>2</sup>
<b>Watershed Characteristics</b>	<ul style="list-style-type: none"> <li>• Major tributaries: Catfish Creek, Nineteen Creek, Bradley’s Creek, Silver Creek.</li> <li>• 3 subwatersheds.</li> </ul>	<ul style="list-style-type: none"> <li>• Major tributaries: Nottawasaga River, Innisfil Creek, Boyne River, Mad River, Pine River, Willow Creek.</li> <li>• 9 subwatersheds.</li> </ul>	<ul style="list-style-type: none"> <li>• Major Tributaries: Conestogo River, Nith River, Speed River, Eramosa River.</li> <li>• 7 subwatersheds.</li> </ul>
<b>Resource Problems</b>	<ul style="list-style-type: none"> <li>• Area of intense agriculture.</li> <li>• Urban development.</li> <li>• Wastewater treatment plant effluents.</li> <li>• Naturally low base-flow.</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing development and projected growth in region.</li> <li>• Innisfil Creek is an area of concern for low water conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Intense agriculture.</li> <li>• Rapidly expanding urban area.</li> <li>• Six areas of special attention have been identified for expected supply problems, including Whitemans Creek.</li> </ul>
<b>Monitoring stations</b>	• 15 monitoring wells sponsored by different organizations/programs.	• 19 Provincial Water Quality Monitoring Network sites.	• There are over 45 stream flow and level gauges.

(Lake Erie Source Protection Region Technical Team 2008a; Lake Erie Source Protection Region Technical Team 2008b; Nottawasaga Valley Source Protection Area 2014)

All three areas have areas of intensive agricultural and are predicted to face increased development pressure. The number of monitoring sites is linked to the size of the watershed. The areas receive similar amounts of precipitation because of their geographic location in the Great Lakes eco-region (Lake Erie Source Protection Region Technical Team 2008a). Stream flow depends on the system in question and varies within and between watersheds. Catfish Creek and Grand River watersheds are two of the four conservation authorities included in the Lake Erie Source Water Protection Region and share information and have a close working relationship (Lake Erie Source Protection Region Technical Team 2008a). Both watersheds drain directly into Lake Erie. The three case studies have similar biophysical conditions on a watershed basis, but once the scale is reduced to the sub-watershed level, context may vary especially in high risk areas for low water, for example Innisfil Creek in Nottawasaga Valley watershed or Whitemans Creek in Grand River watershed.

#### **4.3.2 Social Characteristics**

The social characteristics that are considered in this study represent attributes of the communities in the case study watersheds. Details about water users and the predominant uses of water are an area of focus for social characteristics.



**Table 4.2: Social Characteristics by Case Study**

	<b>Catfish Creek</b>	<b>Nottawasaga Valley</b>	<b>Grand River</b>
<b>Population</b>	<ul style="list-style-type: none"> <li>• 21,200</li> </ul>	<ul style="list-style-type: none"> <li>• 181,000</li> </ul>	<ul style="list-style-type: none"> <li>• 821,000</li> </ul>
<b>Primary Water Users</b>	<ul style="list-style-type: none"> <li>• Agriculture is the largest land use.</li> <li>• Corn, soybean and grains are the largest crops.</li> <li>• Irrigation is not extensive and is mostly used for specialty crops.</li> <li>• Irrigation is centered in the southeast.</li> <li>• Agricultural irrigation is still the greatest permitted user of water followed by municipal water supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Agriculture is the largest land use particularly hay/pasture and row crops.</li> <li>• Cattle and chicken are common livestock in the region.</li> <li>• 79 active aggregate operations.</li> <li>• Multiple golf courses operate in the region.</li> </ul>	<ul style="list-style-type: none"> <li>• Fishery, Municipal, dewatering, aggregate washing, aquaculture, remediation, golf courses, agriculture, and industry all have PTTW.</li> <li>• Corn, hay and soybean are the largest crops.</li> <li>• Irrigation is not extensive and is mostly used for specialty crops.</li> <li>• The estimated volume of water permits is 162 million cubic meters.</li> </ul>
<b>Urban/rural characteristics</b>	<ul style="list-style-type: none"> <li>• Urban centers include the Town of Aylmer (7,151 in 2011).</li> <li>• Predominantly rural.</li> <li>• Less than 11% of watershed is forested.</li> <li>• 84% of land is used for agricultural.</li> <li>• Stable development growth forecasted.</li> </ul>	<ul style="list-style-type: none"> <li>• Urban centers include Collingwood (19,421 in 2011) and Wasaga Beach (17,537 in 2011).</li> <li>• Largely rural.</li> <li>• 34% of the watershed in natural vegetative cover.</li> </ul>	<ul style="list-style-type: none"> <li>• ¾ of the population live in urban centers including Kitchener (219,153 in 2011), Cambridge (126,748 in 2011), Waterloo (98,780 in 2011), Guelph (141,097 in 2011) and Brantford (135,501 in 2011).</li> <li>• 19% rural population.</li> <li>• 75% of land is used for agriculture.</li> <li>• Population growth will be high in urban cores.</li> </ul>

(Lake Erie Source Protection Region Technical Team 2008a; Lake Erie Source Protection Region Technical Team 2008b; Nottawasaga Valley Source Protection Area 2014)

Grand River and Nottawasaga Valley watersheds are forecasted to face greater development pressures. This pressure is already manifesting through demand for agricultural land from infringing developments and pressure to sell. Irrigation is localized in each watershed to specific productive locations. The Grand River watershed has multiple water use sectors that require PTTW and a large number of permits whereas Nottawasaga Valley and Catfish Creek watersheds are predominantly agricultural permits and a few golf course permits.

### 4.3.3 Institutional Characteristics

The institutional factors that are discussed in this section pertain to the government and natural resource organizations that operate in support of low water conditions. Municipalities are described because they contribute to the funding and capacity of conservation authorities as per the *Conservation Authorities Act*. Resource management authorities that operate in the watershed are discussed because they represent additional resource capacity for making informed decisions on LWR.

**Table 4.3: Institutional Characteristics by Case Study**

	<b>Catfish Creek</b>	<b>Nottawasaga Valley</b>	<b>Grand River</b>
<b>Municipalities</b>	<ul style="list-style-type: none"> <li>• 7 municipalities are found in CCCA boundary.</li> <li>• Includes Elgin and Oxford counties.</li> </ul>	<ul style="list-style-type: none"> <li>• 10 upper, 14 lower municipalities.</li> <li>• 74% of watershed part of Simcoe County.</li> </ul>	<ul style="list-style-type: none"> <li>• 38 whole and part, upper and lower tier Municipalities.</li> <li>• 2 First Nations.</li> </ul>
<b>Resource Management Authorities</b>	<ul style="list-style-type: none"> <li>• Catfish Creek Irrigation Advisory Committee.</li> </ul>	<ul style="list-style-type: none"> <li>• Innisfil Creek Water Users Association.</li> </ul>	<ul style="list-style-type: none"> <li>• Whitemans Creek Irrigation Advisory Committee (now defunct)</li> </ul>

(Centre of South Simcoe 2014; Grand River Conservation Authority 2008; Lake Erie Source Protection Region Technical Team 2008a; Lake Erie Source Protection Region Technical Team 2008b; Nottawasaga Valley Source Protection Area 2014)

Each of the watersheds at one point had a form of farmer-led irrigation advisory committee spurred by funding from OMAF in mid-2000. The plan was for funding to initiate the committee, which was expected to carry on after funding ran out. The Water Users Association in Nottawasaga Valley watershed is still operational. The Grand River had an Irrigation Committee around Whitemans Creek, which disbanded. Catfish Creek has an Irrigation Advisory Committee, which has recently been reinvigorated after a few years of being non-operational.

Catfish Creek is the smallest conservation authority and has the smallest number of municipalities. It is largely an agricultural water user base. There is a partnership between CCCA and GRCA to share resources. Nottawasaga Valley has a more varied water user base than Catfish Creek, but not as extensive as Grand River. There are resources to take on special projects to confront the challenges of low water. Grand River is the largest watershed with the most diverse and largest number of PTTW. However, they also have the capacity and resources to better understand the impact of low water and determine strategies for ameliorating impacts. Each conservation authority faces unique opportunities and challenges in making decisions for LWR. Understanding the differences in biophysical, social and institutional contexts allows for understanding whether the experiences of each WRT are comparable and what factors make experiences transferable.

## Chapter 5

### Results

Chapter Five reports the research results. These results provide evidence for understanding how collaborative approaches are incorporated into government decision-making and whether the government is respecting collaboratively-reached outcomes. Results are organized by case study, except for results that were reached at the provincial level. Provincial results were separated from case studies because documents and most interviews pertained to Ontario in general. Each case study section presents data from the watershed and individual scales.

First, the components of the IAD framework – action arena and patterns of interaction – are used to compare the case study experiences for how WRT outcomes are used in government decision-making. Second, indicators of the extent government is respecting the outcomes from WRTs are discussed. Implementation factors include a focus on the required steps for recommending the OWDC declare a Level 3, including documentation of conservation efforts; social, environmental and economic impact; and recommendations for prioritization for use. Additionally, data on stakeholder inclusion in decision-making and satisfaction in outcomes are assessed to understand whether the government is respecting outcomes. The chapter ends with a cross-case analysis of case study locations.

#### 5.1 Provincial Level

The provincial level section overviews (1) how the government makes decisions for LWR, (2) the relationships with WRTs and (3) government officials' perspectives on designating Level 3. This section was used to understand the provincial context for each case study. It also represents the government opinion of the LWR program and can be compared to the experiences and opinions of WRT members.

##### 5.1.1 IAD Framework

The provincial analysis of the IAD framework captured who is included in government decision-making for LWR and how decisions are made. This begins to reveal how government is using the input from collaborative decision-making to inform final decisions. See Table 5.1 for findings specific to the action arena rules from the provincial scale of analysis followed by a discussion of the table.

**Table 5.1: Results from the IAD Action Arena**

<b>Rule</b>	<b>Findings</b>
<b>Position</b>	<ul style="list-style-type: none"> <li>Any department that has a stake in managing low water conditions participates (largely MNR, MOE, OMAF, but others also play influential roles depending on local context).</li> </ul>
<b>Scope</b>	<ul style="list-style-type: none"> <li>Provincial representatives from each department offer regulatory support to WRTs.</li> <li>OWDC is responsible for declaring a Level 3 based on available information.</li> </ul>
<b>Authority</b>	<ul style="list-style-type: none"> <li>MNR is the lead of the program and financially supports the WRTs.</li> <li>MNR houses the LWR document and maintains a link to all data collected and analyzed by the Surface Water Monitoring Centre.</li> <li>MOE ensures compliance with PTTW conditions at all times.</li> </ul>
<b>Information</b>	<ul style="list-style-type: none"> <li>MNR holds information sessions in spring and debrief sessions in the fall.</li> <li>MOE notifies permit holders of Level 2 conditions.</li> <li>OWDC – Technical Advisory Committee is a steering body that provides feedback on the LWR program.</li> <li>There is a good working relationship among provincial departments that is maintained through constant communication.</li> </ul>
<b>Boundary</b>	<ul style="list-style-type: none"> <li>Provincial officials participate based on their position in a government department.</li> </ul>
<b>Aggregation</b>	<ul style="list-style-type: none"> <li>Each government department informs partnering departments of its stance on issues and expected actions.</li> <li>Information is communicated from technical and policy staff working on the LWR files in each department to the Director who takes concerns and information to OWDC.</li> </ul>
<b>Payoff</b>	<ul style="list-style-type: none"> <li>OWDC - Low Water Committee receives input once any watershed enters a Level 2 and is responsible for declaring a Level 3.</li> <li>MOE will impose restrictions to water users if a Level 3 is declared through the prioritization of use developed by the WRT.</li> </ul>

The actions of the provincial government adhere to their responsibilities outlined in the LWR document. The broad role of government is to provide direction and to react to low water conditions through building local partnerships (Ontario Ministry of Agriculture and Food 2013). Individuals and the relationships between departments are directed by the management structure in departments and the authority each department has under the LWR program. Relations among departments are cordial and are strengthened through the history of staff working together. Information sessions organized by MNR are an important tool to ensure local participants are informed on how the LWR program works and their role in WRTs. Debrief sessions allow the MNR to strategically alter the LWR program based on feedback from local partners and their experiences. After evaluation of data it remains unclear exactly how the government incorporated outcomes from WRTs besides taking their recommendations into ‘consideration’ while deciding whether to designate Level 3.

### **5.1.2 Patterns of Interaction**

Provincial interaction patterns highlight governments' decision-making responsibilities. Provincial decision-making is characterized by hierarchical relationships where information flows up to higher levels of power and decisions flow down. Provincial staff inform their Directors of the situation on-the-ground and supply supporting information. Alternatively, Directors may bring issues back to staff for analysis.

Among departments relationships are cordial, as noted by Respondent 07 who stated "it is the responsibility of the Ministries to present themselves as a common government interest. We don't want to be playing each other off ... we're very sensitive to each other's Ministry". Respondent 17 indicated that Ministries are required to work closely to ensure the program is being managed effectively. Respondent 22, while acknowledging that ministries work well together also, mentioned the challenge of having many Ministries responsible for aspects of LWR while the MNR maintains central control for altering the policy framework. The MNR needs to consult with all involved Ministries during policy planning. However, in Respondent 22's opinion, staff in other ministries provide input in an advisory, but limited, role.

At the watershed level, provincial actors spoke positively of the work being accomplished by WRTs. For example, "the WRTs and the ownership that the CAs take for implementing this program is amazing. They are just amazing at working together and ... really taking ownership of the program and implementing it at the local level" (Respondent 17). The synergy in WRTs was noted as essential by the same respondent because they "are the foundations of the program, so if they are operating well the program has the best chance of being effective". The local level of engagement was deemed as necessary by Respondent 07 because "people are more inclined to work with others they know than to be told what to do by strangers".

Provincial representatives who participate on WRTs have experienced certain actors or sectors not actively engaged in WRTs. One respondent (02) had experienced occasions when agriculture had been the only water users present. This resulted in some resentment towards other members who should have been present and sharing the work load. The same respondent also had been present at meeting where not all provincial departments had been represented at WRT meetings. However, Respondent 22 mentioned that it is the aim of lead departments to have representatives present at meetings.

### **5.1.3 Respecting the Outcomes from Collaborative Processes**

Declaring a Level 3 in LWR can be difficult because judging when a watershed has entered emergency conditions is challenging because there are a number of indicators to consider. Respondent 17 noted that "there is no solid indicator that says when you get to this point you are officially in a Level 3". This quotation stems from the requirement to present social, economic and environmental stresses that low water places on water users and the surrounding environment, which are difficult to measure (Environmental Commissioner of Ontario 2012b). Respondent 07 noted that "at Level 3 the plan is premised on the Director using other legal mechanisms (e.g., notices and orders) to suspend someone's water taking on the justification that it is necessary ... so that other more important or essential water use can be sustained". The respondent continued to discuss that the province ensures that it is cautious not to preemptively designate a Level 3 by noting: "It's that we want to be very careful about introducing regulatory, mandatory restrictions on people's use of water when we are not really sure that it is necessary

because people are pretty self-sufficient, they are pretty resilient and up until now we have been able to ride it out.”

#### **5.1.4 Implementation**

In general, provincial-level respondents from all agencies believed that the LWR program achieved its purpose. A non-governmental provincial representative highlighted that LWR “is more or less a ... water resource management tool and it has really forced people to learn how to work together to effectively manage a resource”. Multiple WRTs reported to the government that Level 1 and 2 are effective. Furthermore, the LWR program has increased awareness of water users about the general impacts of low water. Respondent 02 stated that “whereas before people might have only seen their own situation now as we get into periods of drought they are more aware that this is happening throughout the community and also that their actions can be linked and tied to other people and also the natural environment.” However, in a media release the Environmental Commissioner of Ontario reported that “the Ontario government is not doing enough to protect our water resources against the threat of continued dry spells and drought” (Environmental Commissioner of Ontario 2012a).

The MNR reviews the program and gathers input from various people affiliated with LWR to determine appropriate program changes. Notes from the debrief sessions held after the 2012 low water events highlighted the challenges of the reactive nature of the program. Respondents 21 and 02 noted that the program should be more proactive or have had team members question why the plan is not more proactive in planning for future low water conditions. However, Respondents 07 and 22 both discussed that WRTs and individuals have the opportunity to include proactive measures on a local scale. Over the duration of the LWR program it has undergone a number of adaptations that respondents considered beneficial (17, 21). The creation of the Technical Committee to inform the Low Water Committee under the OWDC was suggested by Respondent 22 to be a vital sign that improvements to the program are taking place. The decision to have co-chairs on the WRT, one being a conservation authority member, Respondent 17 felt was beneficial for accountability in the program. However, the Environmental Commissioner believes that these improvements are not enough to protect the environment and a full review of the program is necessary (Environmental Commissioner of Ontario 2012b).

Analysis revealed that water users are relatively self-reliant in dealing with low water situations. They are adapting low water plans or investing in more efficient machinery, often through the assistance of government grants or programs. Conservation authorities are also becoming more involved in water management and are able to leverage local knowledge (Conservation Ontario 2012). However, key questions were raised by Respondent 22 including: if there is a water crisis are there effective water sharing measures that will limit conflict between water users? And how will water be shared among sub-sectors in agriculture and between municipal and non-municipal supply? This respondent believed that LWR conversations need to be expanded to prepare for the future, but it is difficult to create momentum because low water and drought are ephemeral policy issues; it is usually only discussed during low water conditions. Discussing low water only during crisis management tends to be hectic and does not foster meaningful, well thought out changes to policy (Respondent 22).

#### **5.1.4.1 Documented conservation and reduction efforts**

The purpose of Level 3 is to impose restrictions because voluntary measures have been exhausted. According to the LWR program, the target of Level 3 is to “reduce and manage water use demands to the maximum extent” (Ontario Ministry of Natural Resources, *et al.* 2010, 24). Evidence for supporting a Level 3 designation requires including evidence of water users following reductions at Level 1 and 2. The Environmental Commissioner of Ontario has identified the requirement to document conservation and water reduction as a difficult requirement because the program promotes completely voluntary reductions (Environmental Commissioner of Ontario 2012b). The Environmental Commissioner of Ontario also noted that it can take weeks for WRTs to gather the required information for supporting a Level 3 recommendation. However, as reported in a media release quoting the Environmental Commissioner during low water conditions “time is of the essence” (“Environment watchdog slams” 2012). The time it takes to prepare a supporting case for a Level 3 might allow serious drought impacts to incur without provincial response. The Environmental Commissioner of Ontario highlighted that this is a particular concern for the next big drought event in Ontario (Environmental Commissioner of Ontario 2012a).

At the provincial level there is advocacy for individuals to prepare contingency plans and adaptively manage personal water resources by working together. OMAF has created resources for water users to be more aware of their personal water situation and plan for the future through contingency planning (Myslik 1999; Ontario Ministry of Agriculture and Food 2013). Conservation Ontario also has materials that promote reducing demand for water at the watershed scale (Conservation Ontario 2003). Respondent 07 also stated “people are reasonably expected to be relatively self-reliant, to build your resiliency, diversify your sources, [and] think about the long term”.

#### **5.1.4.2 Documented social, environmental and economic impact**

To support the case for designating a Level 3, evidence of social, environmental and economic impacts needs to be presented to the OWDC. Respondent 07 elaborated on the importance of ensuring that water users who cannot access water are identified because “we need to know who they are because if we were to deliver a package of regulatory controls, we would want to ensure it was appropriately targeted”. However, as noted in subsequent sections, water users often will alter their watering practices before admitting to impacted water use.

A challenge that was acknowledged by Respondent 22 is the difficulty of recommending the OWDC designate a Level 3 for the first time. It is unknown what information is required and the level of detail for proving low water conditions are having an impact. The Environmental Commissioner of Ontario notes the challenges for gathering information concerning economic and social impacts (Environmental Commissioner of Ontario 2012b). The Ontario Federation of Agriculture in a 2009 letter about amendments to LWR also highlighted the difficulty in knowing what kind of data is required to be included with recommendations.

#### **5.1.4.3 Recommendations on Prioritization of Use**

One of the concerns discussed in interviews with water users is the requirement for all water users to reduce taking, while only a small number of water takers actually withdraw water directly from surface water sources. Withdrawals from surface water can have a greater impact on the

surrounding environment and fellow water users than irrigation ponds or ground water taking (Myslik 1999). Respondent 02 mentioned that “It is a bit hard because it does single out people on the one hand, but on the other hand you want to target your message to the people that are actually having an impact and being affected”.

The LWR program document states “decisions on low water and drought response and potential water use restrictions are best made with the support and advice of local water managers and users” (Ontario Ministry of Natural Resources, *et al.* 2010, 18). However, prioritization of use was recognized as a difficult task by provincial respondents. Respondent 07 questioned “How do you approach that (1000’s of permits) as a community in fairness? How do you start turning some of them on and off?” Respondent 08 brought up the challenge of determining appropriate roles for the province and local community in determining a fair prioritization of use that clearly integrates input from the local scale.

The PTTW program, the tool that permits water taking over 50,000L/day, is not designed to prioritize water allocation, which has been a criticism from the Environmental Commissioner of Ontario. The Environmental Commissioner of Ontario recommended in his 2012 report that the “PTTW program ... include methods to prioritize the allocation of PTTWs and consider the cumulative impacts of water taking to better prevent low water conditions” (Environmental Commissioner of Ontario 2012b, 105). However, there was hesitancy from provincial respondents in taking on the responsibility of prioritizing water use especially because there is disagreement over whether or not low water conditions to date have required intervention. Respondent 07 emphasized the dilemma:

Are we really sure that there is enough of a problem here to warrant any disposition of our resources? It gets very challenging ... the policy structure around LWR creates an unfortunate fog, especially regarding the determination of prioritization of use. If it was a recipe approach, this then that, it would happen pretty easily. We are not in the position of using a one-size fits all recipe; and I don’t know if we want to be.

### **5.1.5 Summary**

According to the results from the provincial scale analysis it appears that the government adheres to its responsibilities outlined in the LWR program, but there is the caveat that only provincial opinions were included in this section. Government officials reported working well together in administering the joint program. However, it can be difficult to make changes to the program because another department may hold responsibility and alterations usually happen during low water conditions, which can be stressful. Responsibilities are administered through conventional government approaches to decision-making that do not fully take into consideration members of the collaborative body. The provincial respondents reported that WRTs are an effective medium for decision-making and implementation around low water conditions. The focus on the local scale is an important aspect of the program because it allows for local conditions to be included in decision-making and better implementation because information is spread through peers.

There have been challenges in WRTs ensuring that all impacted users and required water management agencies are at the table and have a voice. Overall, the general belief at WRT meetings is that it is worthwhile working collaboratively on low water conditions, although it may be stressful at times. The province has been hesitant to interfere in water users’ access to water. Water users are believed to be self-sufficient in adapting to low water situations. In the



event of a low water crisis there is uncertainty if an appropriate government response could be provided, but there is little momentum to tackle program challenges outside of drought conditions.

Environmental watchdogs and concerned organizations at the provincial level have outlined challenges of documenting the necessary support for the OWDC to designate Level 3. Particularly, voluntary reductions are difficult to document. The slow process of accumulating the resources to recommend a Level 3 designation from the OWDC has also been recognized as a challenge of the program. One government official highlighted that the first WRTs to proposition for a Level 3 have a difficult time in succeeding because the level of detail necessary to support a claim is difficult to guess. The provincial government acknowledges that LWR requires revisions to ensure that priorities for water use are protected during low water conditions. It is recognized that creating a prioritization of use is a difficult and unsavory responsibility, but is necessary in times of crisis.

## 5.2 Catfish Creek Watershed

The analysis from the watershed and individual scale are presented through the ‘action arena’ and ‘patterns of interaction’ codes. The watershed scale provides insight into how decisions are made and recommendations provided to the provincial government. The individual scale details how water users implement decisions. Analysis of these two scales illuminates how government integrates input from the WRT and individuals. The ‘outcome’ and outcome evaluation criteria is subsequently reported to provide support for understanding whether the government is respecting the outcomes from WRTs. Implementation is reported through a focus on the process of declaring a Level 3. This requires the WRT to prepare evidence of voluntary water reduction at Level 1 and 2; documentation of social, economic and environmental impact; and a prioritization of use. Finally, data was outlined regarding whether team members of the WRT felt their opinions were incorporated into collaborative decision-making and if they were satisfied by outcomes.

### 5.2.1 Watershed

The IAD framework discusses the structure, decision-making and outcomes of the WRT. The outcomes of the WRT are used to inform decision-making at the provincial level and affect the actions of water users at the individual scale. See Table 5.2 for data from the action arena rules followed by discussion of the table.

**Table 5.2: IAD Action Arena**

<b>Rule</b>	<b>Findings</b>
<b>Position</b>	<ul style="list-style-type: none"> <li>• Predominantly agricultural water users are present on the WRT because agriculture dominates water taking permits in the watershed, but there is sporadic participation from golf course representatives and aggregate firms.</li> <li>• Good representation of various growers and sectors.</li> <li>• Some municipalities feel they play a limited role on the WRT.</li> </ul>
<b>Scope</b>	<ul style="list-style-type: none"> <li>• WRT declares Level 1 and 2.</li> <li>• WRT recommends declaring Level 3 to OWDC, but must provide supporting documents.</li> </ul>

<b>Authority</b>	<ul style="list-style-type: none"> <li>• A chair and secretary are elected annually for the team, but provincial representatives cannot be selected.</li> <li>• Members attend meetings, communicate with their sector, share data, and implement decisions.</li> <li>• Provincial Government field queries from water users about LWR and play a supportive role.</li> <li>• CCCA facilitates meetings, declares Level 1, plays a large directing role, measures indicators, provides indicator reports, spreads word of level changes, and promotes water conservation initiatives.</li> <li>• Water users share observations on water levels, levels of irrigation, answer to farming practices vs. community perceptions of ‘wasting water’, and give input for changing levels.</li> </ul>
<b>Information</b>	<ul style="list-style-type: none"> <li>• Provincial government representative are the intermediary between WRT and OWDC.</li> <li>• There is constant updating of the team on watershed conditions.</li> <li>• Everyone speaks for themselves if present.</li> <li>• There are very frank discussions and people speak their mind.</li> <li>• Water users inform other people in their sector of watershed conditions.</li> <li>• Catfish Creek is a small watershed so people on the team know most producers and their irrigation practices.</li> <li>• There are a number of medians for getting the message out to people that are not on the team.</li> </ul>
<b>Boundary</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily take part, but some are specifically asked due to their experience.</li> <li>• Tobacco was historically a significant crop and to some extent is still today so the tobacco lobby felt that it was imperative to take part in the WRT to represent the large number of agricultural producers in the region.</li> <li>• Provincial representatives, conservation authorities and municipalities are asked to take part in WRT as part of their job duties.</li> </ul>
<b>Aggregation</b>	<ul style="list-style-type: none"> <li>• All members have equal decision-making power (except for provincial government who do not vote) and equal opportunity to participate.</li> <li>• Meetings are as required and called by the chair.</li> <li>• Participants meet in person.</li> <li>• Quorum consists of one-third of voting members present at meetings.</li> </ul>
<b>Payoff</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily reduce water use at Level 1 and 2.</li> </ul>

The responsibility of the WRT and the roles of individual participants largely conform to the specifications outlined in the LWR program. There are characteristics of the Catfish Creek WRT that are due to the rural nature of the watershed, such as the dominance of agricultural water takers on the team and the participation of the tobacco lobby. The strong participation by agricultural water takers may sway the priorities for water taking in recommendations to the OWDC. Municipal representation also may require a stronger voice or role. Respondent 03 stated: “In my opinion the municipality has a limited role in that it is more or less the

[conservation authority] that has the bigger role ... as far as my role there isn't much more than having to go to council.”

Catfish Creek WRT does not use consensus to come to decisions. However, Respondent 01 expressed that conflict has not arisen from declaring levels and most participants agree to the decision. It was significant that provincial government representatives act as the intermediary between the WRT and the provincial scale. If there was a more local link between the collaborative body and the province different priorities or information might be expressed to the OWDC.

### **5.2.1.1 Patterns of Interaction**

Members of the Catfish Creek WRT reported good working relations among team members. Also during discussion with team members of the WRT individuals seemed to know each other well and had a comfortable relationship with one another. Respondent 01 felt that these good relations were garnered through increased communication, which improves the conditions of LWR. They revealed this sentiment through saying, “I think the really big thing is communication ... and when I start really paying attention to that communication I feel that we get better results”.

Team members discussed that precipitation and stream flow can vary locally, which is challenging for applying general solutions. It was also suggested that ‘city’ dwelling governments are less able to perceive the challenges that are present for rural based regulation, such as agriculture. A local WRT can give feedback about the potential impacts and compliance levels for provincial regulations, which is captured in the following quotation by Respondent 05:

Toronto or Ottawa can make rules and regulations and sometimes they have no damn idea what they are making them for. Well, they know what they are making them for, but they don't know how it is going to affect people, and certainly by having committees there can be conversation and word goes back this will work, this won't work or try it what have you. I think as a liaison between the actual users and the people making the regulations ... [it] is very important because if you put regulations in that you can't live with everyone is going to break them.

### **5.2.2 Individual**

The individual scale underscores the actions of water users affected by low water decisions made at the watershed scale. Individuals can also provide feedback to the provincial scale by the actions they choose to take or through direct communication. The action arena examines how water users reacted to the decisions of the WRT and whether outcomes were implemented and if water users were satisfied by outcomes from the WRT. Figure 5.3 outlines the findings from the action arena.

**Table 5.3: IAD Action Arena**

<b>Rule</b>	<b>Findings</b>
<b>Position</b>	<ul style="list-style-type: none"> <li>• Members on the WRT spread word to their respective sector.</li> <li>• MOE informs permit holders of Level 2 conditions.</li> </ul>
<b>Scope</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily reduce water use at Level 1 and 2.</li> </ul>
<b>Authority</b>	<ul style="list-style-type: none"> <li>• Municipalities implement outdoor water use bylaws.</li> <li>• Water users visit fellow farmers to spread voluntary water reduction messages during Level 1 and 2 and to inform farmers that they need permits.</li> </ul>
<b>Information</b>	<ul style="list-style-type: none"> <li>• Working on promoting best management practices in agriculture.</li> <li>• Dug out ponds are promoted to act as a water supply, but it is expensive to install them.</li> <li>• Encourage water takers to get permits to take water.</li> </ul>
<b>Boundary</b>	<ul style="list-style-type: none"> <li>• All water takers with permits in the conservation authority boundary are expected to participate.</li> </ul>
<b>Aggregation</b>	<ul style="list-style-type: none"> <li>• Participation in water reduction is strictly voluntary.</li> </ul>
<b>Payoff</b>	<ul style="list-style-type: none"> <li>• Water users weigh personal costs of reducing their water use.</li> </ul>

Catfish Creek is a small watershed and most water users know each other from living in the community. It is easy to communicate the need for water reductions at Level 1 and 2. However, given the voluntary nature of LWR it is difficult to know how much water is being reduced. Respondent 3 noted that “some people [in the public] are all for it [water reduction] and some people scream and yell at us”. Best management practices for conserving water are initiated by the water user and whether they are practiced depend on the individual and their motivations for conserving water. The voluntary nature of water reductions and whether best management practices are used has implications for how water is shared among water users and conserved for environmental needs, especially during low water.

### **5.2.2.1 Patterns of Interaction**

Prior to the formation of the WRT, farmers described misunderstandings between the public and farmers over water use on farms; these are beginning to be resolved since the creation of the WRT. The WRT is helping to resolve these issues as highlighted in this quotation by Respondent 04: “that is probably the biggest thing to have some way of communicating with officials so that they can put the word out that people are being responsible and we have permits and we are not stepping outside the boundaries on what we are allowed to take”. Members of the WRT identified the need to have increased education for the general public and the agricultural community about the impacts of low water.

Before the LWR program created collaborative WRTs there were also more misunderstandings among farmers. The WRT has provided an environment to discuss water use among water users and helps ensure that everyone is within the limits of their permits. This does not imply that there are no water use issues between farmers, but that there is a more refined process to resolve challenges as explained by Respondent 05:

Since we have had the LWR team we have had some real dry years ... and we never had that big of controversy during those years, but I remember before they had that there sure as heck was you know. I think we have been able to liaison with growers and with the public, the general public in what we're doing and keeping heads cool and make the best of a bad situation without getting into a water war, what they use to call it.

### **5.2.3 Outcomes**

In 2007 Catfish Creek indicated Level 3 conditions. The team informed OWDC that a subwatershed was in Level 3, but did not recommend declaring an official level due to inadequate background information. Respondent 07 also expressed that Catfish Creek WRT was hesitant to recommend declaring a Level 3 because participants did not want to have restricted access to water. This highlights a challenge in local water users participating in decisions to recommend water restrictions.

### **5.2.4 Implementation**

Water users of the Catfish Creek WRT recognized that a Level 3 has not been declared and worried about the implications of it being designated with the present state of the program. Respondent 04 questioned "last year [2012] when everybody was scared to death and well what does that [Level 3] entail?" In response, Respondent 05 added "yeah and nobody knew how to handle it [Level 3]." It was the general opinion of water users that conditions through the PTTW should be administered to reduce water taking before Level 3 indicators are met.

Members of the Catfish Creek WRT believed that a Level 3 was unlikely to ever be designated. For instance Respondent 01 noted: "I don't think we will ever see a Level 3. I'll be so surprised to see a Level 3 and the reason for that is there is just too much at stake". Respondent 04 expressed that "you are going to need such a catastrophe summer that hits southwestern Ontario before that would in my mind ... that it would make sense. Every area gets different rainfalls and eventually Mother Nature straightens it up."

#### **5.2.4.1 Documented conservation and reduction efforts**

There is not a requirement to report voluntary reduction in water use (Environmental Commissioner of Ontario 2012b). Respondent 01 noted that most users reported verbally at meetings to reducing use once a level is declared. However, in Catfish Creek there is not the capacity to actively collect documentation of water reductions above voluntary reporting (Catfish Creek Conservation Authority 2009). Therefore, it is difficult to determine the percentage of users who heeded voluntary reductions. One question that arose from document analysis was whether a Level 3 recommendation could proceed if the team could not document water use reductions during Level 1 and 2 (Catfish Creek Conservation Authority 2009).

Farmers reported being more receptive to conservation or efficiency messages coming from fellow growers rather than from an enforcement agency. This may be due, according to Respondent 01, to past conflicts between water users and regulatory agencies. WRT members outlined a number of reasons for conservation during times of low water besides in response to requested reductions. Often the source becomes unreliable due to the level of water and amount of water needed for operations. The cost to irrigate is also increasing and often crops are not watered due to the economic impacts. Pursuing water efficient technology and best management

practices are in the best interests of the farmers because they are economical. Respondent 04 noted that “it [farming] is becoming big business and we need to become business oriented and part of that is being diplomatic. It’s not the Wild West out here it can’t be.” Respondent 06 believed that having offline water sources and water permits is a good investment because it will increase the value of the property on farms. Respondent 04 said that there was also the expectation to conserve because the community is small and prone to gossip if a grower is not acting in the community’s best interest. Despite these benefits of water conservation the *Requirements for Recommending a Level III Report* found that “the environmental incentives for water reduction are ineffective when livelihood is at risk” (Catfish Creek Conservation Authority 2009, 15).

Over time, water users have been making infrastructure investments and management decisions to adapt to changing weather, economics and industry standards. The overall reduction in water use of individual water users is not reflected in voluntary reductions, which is worrisome to some users. For instance, Respondent 01 elaborated on a situation faced by a water user “I have already cut back by 50%. I can’t cut back another 20% ... [Best Management Practices] have already allowed me to cut back and I am pretty much running on the bare minimum because of economics”.

#### **5.2.4.2 Documented social, environmental and economic impact**

Agriculture is a big investment business that has an intensive work load and requires waiting until harvest for investments to pay out. One factor that was raised by Respondent 01 is what would happen if farmers could not access water and had to watch their crops wither and die while they personally may have had access to water. A related question was how would insurance support their losses? The LWR program does not guarantee compensation for losses. It was outlined in *The Requirements for Recommending Level 3* that water reduction tactics are engaged “too late to avoid social and economic impacts” and it would be better if there was a proactive approach (Catfish Creek Conservation Authority 2009, 16).

The necessity to gather economic impacts for achieving a Level 3 was believed by Respondent 01 to be “a stall tactic for implementing Level 3”. The respondent went on to mention that providing evidence of economic impact is difficult given the limited amount of time available to gather information for declaring Level 3.

Water users interviewed during the study had a strong affinity for environmental protection. Respondent 04 elaborated by saying “I think most farmers we love our land, we love our farms and we love our wildlife and most of us do not want to do anything detrimental to our wildlife. We enjoy seeing our fish and our grandkids go fishing ... so we try to draw the line that we minimize any effect that we have on the environment.” This sentiment reveals that water users would not draw down water resources if there was the potential to negatively affect the environment.

#### **5.2.4.3 Recommendations on Prioritization of Use**

Catfish Creek has not recommended declaring a Level 3 to the OWDC. Therefore, the team had less experience than other WRTs in providing supporting documentation. Nonetheless, some input regarding declaring a Level 3 was noted in data collection. One document noted that “the [Catfish Creek Low Water Response Team] and the CCCA do not have the tools to make an

informed calculated decision to provide recommendations regarding water use prioritization within the watershed” (Catfish Creek Conservation Authority 2009, 15).

There was a strong sentiment from Respondent 01 that team members did not know how to fairly prioritize use among water users and it was believed that the government should be responsible for prioritizing use. “How am I going to recommend that my crop is more valuable than yours? How is anybody going to do that ... I will not make those recommendations because I will not task neighbour against neighbour.”

### **5.2.5 Stakeholder Inclusion and Satisfaction with Outcomes**

Water users involved in the WRT appeared to be very involved in team meetings. Their opinions were incorporated in decisions related to moving to different levels, and they provided input on water levels and past weather conditions. Respondent 03 described their involvement by saying “It is definitely their responsibility to keep us involved and have us as a member on the response team and the CA looks for input from us during dry weather events or wet weather events”.

Furthermore, respondents seemed to have a very hands-on approach to implementing the decisions from meetings. They discussed LWR with neighbouring farmers, persuaded users to get permits to take water and disseminated calls for voluntary reductions. The peer-to-peer process of decision-making appeared favourable to water users in Catfish Creek. While visiting a farm I observed a discussion of how a collaborative approach like WRTs would be beneficial for spreading best practices for nutrient management because it had worked well for LWR. This represents that members of collaborative groups believe that the process is an effective mechanism for sharing best practices among a local community of practice.

Catfish Creek has an active Irrigation Advisory Committee that was initiated through funding from OMAF. Meeting minutes show that the Irrigation Advisory Committee shares information with the WRT and there are individuals that sit on both committees. When the funding for the Irrigation Advisory Committee program stopped the sentiment from farmers involved was that it was of no concern if there was funding because it was more important to have control of the issue and to work together to solve local challenges (Respondent 02). This reflects the satisfaction that came from taking part in local decision-making to address issues that are present in the watershed for farmers.

### **5.2.6 Summary**

The Catfish Creek WRT is organized and functions as outlined in the LWR program. The team is dominated by agricultural interests because the watershed has predominantly agricultural water takings. Provincial representatives on the team are responsible for communicating with the OWDC and individuals at the provincial level. Water users on the WRT played a large role in spreading the message of LWR to other water users. This WRT had very close ties among water users. This may be because it is a small watershed. Members of the WRT believed that they were fully included in decision-making. WRT members reported large participation on the ground. Water users on the team spoke with colleagues to spread word about water conservation and voluntary reductions.

The collaborative process for making decisions about low water was reported to have many beneficial outcomes. Increased communication that led to water users having a more direct effect on decision-making was highlighted as an improvement to past agency driven attempts at

reducing water use. LWR has provided a medium to educate on efficient water use practices and methods to share water. Water reduction is a part of responsible business; reduction in water use does not necessarily occur because of a level being declared. Farmers may reduce water taking because it is in their best interest, the source may have become unreliable or the cost of irrigation is too high. However, if crops require water the disincentives during low water are not strong enough to curb use.

Catfish Creek has not recommended declaring Level 3 conditions, but Level 3 conditions have existed in the watershed. WRT participants felt that it was unlikely for a Level 3 to ever be declared given its current state. CCCA does not have the present capacity to produce the information necessary for recommending the OWDC designate Level 3. It is difficult to quantify water use reductions during Level 1 and 2 because reductions are based on verbal reports. Providing economic impacts to support a Level 3 declaration was understood as a stall tactic and finding information was time consuming and difficult. The prioritization of use was believed to be better handled by the provincial government and that certain water uses should not be valued above others. Many water users appreciate the surrounding environment and want to protect it for future generations.

## **5.3 Nottawasaga Valley Watershed**

The conceptual framework that was used to organize data analysis also acts as the guide for this section. Investigating the watershed and individual scales through the IAD framework provides evidence for understanding how the government incorporates collaborative outcomes into final decisions. Outcome protection in LWR was explored through implementation of outcomes and actor inclusion in the WRT and satisfaction in outcomes.

### **5.3.1 Watershed**

The IAD framework overviews the structure, decision-making and outcomes of the WRT. The outcomes of the WRT are used to inform decision-making at the provincial level and affect the actions of water users at the individual scale. See Table 5.4 for the data from the action arena rules as they pertain to the Nottawasaga Valley watershed.



**Table 5.4: IAD Action Arena**

<b>Rule</b>	<b>Findings</b>
<b>Position</b>	<ul style="list-style-type: none"> <li>• Water users primarily represent golf courses, agriculture and landscapers.</li> <li>• It can be difficult for farmers to attend meeting because it is their busy time of year.</li> <li>• There needs to be more robust participation from more municipalities.</li> <li>• Municipalities that do participate voice general concerns and views of municipalities.</li> </ul>
<b>Scope</b>	<ul style="list-style-type: none"> <li>• WRT recommend declaring Level 3 to OWDC, but must provide supporting documents.</li> <li>• WRT declares Level 1 and 2.</li> </ul>
<b>Authority</b>	<ul style="list-style-type: none"> <li>• NVCA is responsible for collecting and disseminating condition indicators, they are the lead on drought planning and play a facilitating role for the WRT.</li> <li>• Municipalities represent municipal views on the WRT.</li> <li>• Water users represent the views and opinions of their sector.</li> <li>• Water users investigate and spread word on conservation practices and technologies in their sector.</li> </ul>
<b>Information</b>	<ul style="list-style-type: none"> <li>• Provincial government representatives are the intermediary between WRT and OWDC.</li> <li>• During meetings water users share industry standards and methods to reduce water use without impacting profit.</li> <li>• Meetings are as needed.</li> <li>• Usually there is one introductory meeting in-person and the following meetings are teleconference, but an in-person meeting is arranged if there is the potential for a Level 3.</li> <li>• Relations among members can be strengthened through working together on projects outside of LWR (municipal and government).</li> </ul>
<b>Boundary</b>	<ul style="list-style-type: none"> <li>• Provincial government, municipalities and conservation authorities take part in the WRT as part of their duties.</li> <li>• Water users that take part volunteer their time to participate in the WRT.</li> </ul>
<b>Aggregation</b>	<ul style="list-style-type: none"> <li>• If required all members usually agree to declare a Level 1 or 2.</li> <li>• NVCA and provincial government are non-voting; they provide information.</li> <li>• During drastic low water conditions water user that do not participate in the WRT are contacted to ensure alternative perspectives are included in decision-making.</li> </ul>
<b>Payoff</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily reduce water use at Level 1 and 2.</li> </ul>

The responsibility of the WRT and the roles of individual participants largely conform to the specifications outlined in the LWR program. Encouraging municipalities and water users to attend meetings can be difficult in Nottawasaga Valley because of summer workloads. Some municipalities have also had consulting work that demonstrates that reductions to municipal water taking would not impact surface water and do not participate. Broad participation is required to ensure that many perspectives are included in planning for LWR and voluntary water reductions

can be used to support the recommendation to declare a Level 3 if required. During drastic low water conditions water users that do not participate in the WRT are contacted to ensure alternative perspectives are included in decision-making. This allows for a broader consultation of water users and the opportunity to voice alternative views. It was significant that provincial representatives report to the staff at the provincial level because it reduces the potential for communication between government and the collaborative body.

### 5.3.1.1 Patterns of Interaction

Members of the WRT report working together well; they engage in informative and diverse discussions. One of the benefits noted of the WRT is participants get to understand the perspectives and realities of various water users. For instance Respondent 16 noted “there is always a good communication back and forth between everybody at these meeting ... something that I wouldn’t necessarily look at from my point of view you can pick up from the rest of the group, whether that is from the farming community or the province or the NVCA”. The benefits of planning water use was also noted as a positive aspect of the WRT. Respondent 12 noted that “I think from a Level 1, Level 2 perspective we find it pretty productive to get everyone at the table and talk about how to coordinate water use.”

### 5.3.2 Individual

The individual scale underscores the actions of water users affected by low water decisions made at the watershed scale. Individuals can also provide feedback to the provincial scale by the actions they choose to take or through direct communication. The action arena examines how water users reacted to the decisions of the WRT and whether outcomes were implemented and if water users were satisfied by outcomes from the WRT. Figure 5.5 outlines the findings from the action arena.

**Table 5.5: IAD Action Arena**

<b>Rule</b>	<b>Findings</b>
<b>Position</b>	<ul style="list-style-type: none"> <li>• Everyone with a PTTW is expected to respond or individuals in sectors involved in WRT (including community members).</li> </ul>
<b>Scope</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily reduce water use at Level 1 and 2.</li> </ul>
<b>Authority</b>	<ul style="list-style-type: none"> <li>• Municipalities take WRT decision into consideration and inform council of outcomes and requests to implement water use bylaws.</li> <li>• Water users reduce water taking to comply with Level 1 or 2 as best they can.</li> </ul>
<b>Information</b>	<ul style="list-style-type: none"> <li>• Cross pollination between the WRT (reactive) and the Innisfil Creek Water Users Association (Proactive) is helpful to be prepared for low water conditions in hotspot areas in Nottawasaga Valley.</li> <li>• Upper tier municipalities pass along information to lower tier municipalities that may not participate.</li> </ul>
<b>Boundary</b>	<ul style="list-style-type: none"> <li>• Water reduction strategies are completely voluntary.</li> </ul>
<b>Aggregation</b>	<ul style="list-style-type: none"> <li>• Participation in water reduction is strictly voluntary.</li> </ul>
<b>Payoff</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily reduce water use at Level 1 and 2.</li> </ul>

The voluntary nature of water reduction makes it difficult to know how much water is actually being conserved at Level 1 and 2. An area in Nottawasaga that often experiences low water situations is Innisfil Creek. The Innisfil Creek Water Users Association is a local water user based group that collaborates to coordinate water use during times of low water in the subwatershed. It is beneficial to identify areas that face more frequent or severe low water events and determine strategies to ameliorate impacts to avoid conflict and personal losses.

#### **5.3.2.1 Patterns of Interaction**

It is difficult to ensure that a strong consistent conserve message is delivered during low water conditions. There are numerous bodies of water in parts of Nottawasaga Valley, as pointed out by Respondent 18, so the main perception may be that there is plentiful water and little possibility for drought. The general public is not aware of voluntary restrictions by water users during low water conditions. Respondent 18 believed that the public observes watering that is taking place for agriculture and golf courses and are confused why they are unable to wash their car or water their lawn.

#### **5.3.3 Outcomes**

Subwatersheds in Nottawasaga Valley experienced Level 3 conditions in 2007 and the WRT recommended that the OWDC designate Level 3. Provincial representatives on the WRT voiced the opinion that there was insufficient documentation, but the team chose to move forward because negative environmental consequences were believed to be pressing. The OWDC reviewed the proposal from Nottawasaga Valley WRT and declined to designate Level 3 conditions due to inadequate documentation supporting the claim, especially socio-economic information and impacts from mandatory restrictions.

#### **5.3.4 Implementation**

Members of the WRT believed that designating Level 3 is an important component of low water mitigation and education. Level 3 underlines the severity of the conditions and would force water users to make reductions in water use. However, Respondent 18 pointed out that the process for moving to a Level 3 “is not really well defined for us and we have I think too few people ... making some of those decisions”. The same respondent noted that “I think there is some merit for pushing for a declaration of Level 3 earlier and not waiting ... I think if you indicate there is actually a Level 3 low water condition people will take it more seriously”. There is also confusion around how restriction would be implemented and what it would mean for water users if a Level 3 was declared.

Respondent 20 believed that if a Level 3 was implemented there would need to be strict enforcement with consequences in order for users to implement water use reductions. This person stated that during a Level 3 “it is basically going to mean that they are going to tell us to not irrigate and before they go to the individual farmers at the pump site ... with a big enough fine to shut those systems down it will never happen because there is no way that a grower is going to stand by and watch his crop starve and lose his crop”.

The political nature of decision-making for LWR was highlighted by three respondents (14, 18, 16). This underscores the unlikelihood of Level 3 being called because it would force the provincial government to restrict water use to a degree that would negatively impact many users.

Respondent 20 stated “I don’t think you will ever find a politician, to be blunt, with big enough balls to call a Level 3”. Another respondent (14) noted that “I don’t think the political will is there because to go to Level 3 someone has to decide who is going to get what water and there is a lot of money at stake in this thing, so it is a tough decision to have to make”. A newspaper article reporting on a WRT meeting also outlined the opposing opinion that the province needs to handle the situation delicately to ensure an appropriate response is reached (Saunders 2012).

In 2007 it took three weeks for the OWDC to officially decline the recommendation to move to a Level 3. Participants felt this was too long, underscored by the fact that by the time the decision was made the subwatershed had moved out of Level 3 conditions. However, depending on the watercourse there can be minimal past records if monitoring had begun recently. This may result in Level 3 conditions or the flow being measured at the lowest recorded flow relatively often.

#### **5.3.4.1 Documented conservation and reduction efforts**

Being involved in LWR has bolstered support for exceeding industry or sector standards and encouraged water users to be innovative in reducing water use to become a role model. However, producers still need to be aware of consumer demand. On the NVCA Irrigation Tour one stop was a sod farm where the accepted practice was to deliver sod brown, but as competitors began to irrigate consumers started expecting green sod, which increased irrigation.

Nottawasaga Valley is an area of high residential development. Therefore, Respondent 13 pointed out, there is a tradeoff to consider in buying more efficient technology and investing in alternative water sources for agriculture. If the farm is bought with the plan to be developed, water security investments will not be recognized by the new buyer of the property. Respondent 12 said that “you are hearing the frustrations that those farmers are having too, with putting that investment in, not knowing long term how useful that is going to be and whether a permit is going to be guaranteed.” Respondent 20 felt that shifting water use off of high use or high impact surface water sources should be compensated.

Municipalities have noticed a reduction in water use through monthly billing, which was believed to be due to people understanding the importance of conserving water, but also the increased cost of water. Water users reported trying to cut back on water use during low water conditions. Respondent 18 contributed voluntary water reduction to water users because they “recognize if they don’t take some voluntary steps they may have some less palatable things [im]posed upon them they are a little bit more willing to think creatively”. However, it is difficult for some industries to further reduce their water taking during Level 1 and 2 because they are already using the least amount of water possible for financial reasons. Respondent 12 felt that the general feeling among water user was “why if I am being as efficient as I can be, why should I have to cut back 10% when I already am doing the best I can?”

A newspaper article captured a discussion at a WRT meeting where growers promoted their belief that farmers use good conservation practices all season long and if certain crops do not get water at specific times they are not viable for market (Saunders 2012). Water users still report adapting their irrigation schedules to the decisions made by the WRT. However, there is no method to strategically monitor and document the reductions that are taken at Level 1 and 2 for evidence needed for a Level 3 declaration.

In the pilot project undertaken by the NVCA it was highlighted that requiring evidence of reductions at Level 1 and 2 might prompt water takers to ignore voluntary reduction in order to thwart a Level 3 and the associated restrictions (Low Water Pilot Team Staff 2008). This would allow environmentally detrimental impacts to continue. Respondent 18 also felt that “the committee is heavily weighted with the people who will be the most negatively impacted by significant water restrictions. It makes the decision-making process a bit skewed I think”. Other respondents reported that they did respond to the decisions of the WRT and would be supportive of moving to a Level 3. Respondent 16 felt that “there was a lot of them in the farming, agricultural community that sit on the LWR committee that were for moving forward with it and I kind of got the opinion at that point that the province was more or less the push back saying no we are not going for that Level 3”.

#### **5.3.4.2 Documented social, environmental and economic impact**

Respondents from Nottawasaga Valley highlighted the need for a Level 3 declaration to protect the environmental function of creeks and streams. In 2007 it was observed that in the Innisfil Creek subwatershed the stream was drying up into puddles of isolated water where fish were floundering (Saunders 2012). Members of the Innisfil Creek Water Users Association stated that during 2007 the stream flow dropped to 350 gallons/minute from an average summer rate of 5,000 gallons (Centre of South Simcoe 2014). It was expected that this reduction would cause significant detrimental impact to the local farming industry, which was valued at \$10 million in 2006 (Centre of South Simcoe 2014). In Nottawasaga Valley, the pilot project report explained, the local economy is bolstered by agricultural income, which creates ‘ripple’ effects in the local economy (Low Water Pilot Team Staff 2008).

In general, the NVCA had difficulty in gathering the necessary documents to support a Level 3 declaration, especially the social and economic indicators as outlined in the pilot study. Conservation authority staff had a short timeframe and inadequate resources to complete the collection of material (Low Water Pilot Team Staff 2008). Furthermore, quantifying the social and economic impacts of drought is difficult. Despite the fact that the WRT was warned by provincial representative that there was insufficient documentation the team believed that it was necessary to recommend Level 3 be designated because environmental conditions were critical. The pilot report found that “the amount of habitat available for aquatic organisms has been significantly reduced” (Low Water Pilot Team Staff 2008, 35). Furthermore, meeting minutes highlighted that fish were stranded in isolated puddles and benthic sampling indicated that sensitive species had been negatively impacted.

#### **5.3.4.3 Recommendations on Prioritization of Use**

Members of the WRT found it difficult to determine a prioritization of use because, as pointed out by Respondent 12, “how can we tell this person that their livelihood is less important than these other people?” It may be easy to suggest that essential uses of water need first priority, but the importance of crops is difficult to prioritize because there will always be financial impact regardless of the crop type. Various options were discussed by the WRT as outlined in the pilot study, but insufficient information was available to effectively prioritize water uses. This resulted in the belief that the provincial government would be better positioned to make decisions on who should face water reductions.

One of the recommendations that stemmed from the pilot study in Nottawasaga Valley was the belief that there should be equal reductions for online water taking across agricultural uses that is not dependent on sectors or crop type. Respondent 20 stated that “there is no priority because it affects everybody’s financial bottom line if they can’t irrigate, regardless of what crop you are growing”.

### **5.3.5 Stakeholder Inclusion and Satisfaction with Outcomes**

Members of the WRT appreciated that the purpose of working together was creating change. Respondent 18 noted that: “I don’t need to go to meetings where all we do is discuss the problem endlessly. I go there [to WRT meetings] because we are trying to be solution driven and we are trying to be mitigative, we are trying to look at what are some things that we can do collectively, voluntarily that might lessen the impact of low water or even lessen the likelihood of low water”. At the provincial scale Respondent 22 pointed out that “Innisfil is a hot spot. A lot of credit needs to go to the farmers in the area because they were willing to put the time forward to help the water situation in the area”.

Trying to mitigate the impacts of low water is a complex policy area. It is difficult to impose sanctions that might result in social and economic stress especially because that is what LWR is trying to ameliorate. However, there are still challenges the WRT faces in making difficult decisions. Respondent 20 noted that:

I guess there needs to be a team, I guess they are not doing too badly, I guess it is just a challenge being on the grower side of it because you know on one hand it seems like a bunch of politicians and the political side telling us we can’t irrigate ... meanwhile we are standing by or expected to kind of half stand by and watch the crops suffer, so I guess there is a reason for the team and they are doing as best they can, does it mean we always agree with it, I am not so sure.

Respondent 16 echoed some of this sentiment in discussing the response from the WRT in 2007 to the rejection of the recommendation for a Level 3 stating:

It was curious, well some of them were wondering well what is the purpose of the LWR team itself if the input is not going to be taken seriously on the provincial level, but yeah I would say I kind of felt that myself too, we were looking at it, reviewing the stuff and we do see the drops, but it continues on and the weather forecast at the time wasn’t looking like it was going to let up.

This quotation clearly underlines the frustration of seeing environmental stress and the indicators necessary to designate Level 3 with no reaction from provincial officials despite the fact that it is their role to act on the recommendations of the WRT.

### **5.3.6 Summary**

The Nottawasaga Valley WRT functions as outlined in the LWR program report. However, inclusion of diverse participants was difficult to achieve and remained a hurdle for representative decision-making. The ability of participants on the WRT to skew decision-making against water users that are not at the table was highlighted by respondents in the Nottawasaga Valley. Provincial representatives on the team are responsible for communicating with the OWDC and other provincial departments. The WRT was influential for increasing communication that led to

aligning perceptions of different water uses and coordinating water use. However, the public requires further education on large water taking operations and the efforts water users take to reduce water use during low water. LWR has prompted some water taking industries to drastically innovate their uses of water to reduce takings. While other industries may have more difficulty in meeting reduction standards and planning water reduction for the future especially because of future uncertainty of their need for water, such as with agriculture. Some water users report conserving the maximum extent and feel it is unfair that they need to prove additional conservation.

In 2007 most users were in favour of recommending a Level 3, but provincial participants advised against it. The WRT recognized the lack of a clear strategy for designating Level 3 and implementing water control measures, but thought declaring Level 3 is a necessary step in the LWR program. The need to protect the ecological functioning of water courses was a priority for the WRT in Nottawasaga Valley. Some respondents felt that not declaring a Level 3 ignored detrimental environment impact caused by low water. The political nature of declaring a Level 3 was noted as skewing the decision not to designate Level 3 and likely will result in Level 3 never being designated.

Members of the WRT believed that if Level 3 is going to be effective at relieving stress during emergency low water events the deliberation period for the OWDC needs to be drastically reduced. More data also needs to be collected in order to understand when Level 3 conditions are present in subwatersheds that do not have historical monitoring data. Collecting documents necessary for supporting a recommendation for a Level 3 is difficult especially given the high stress atmosphere, quick turn over of necessary documents, lack of resources and difficulty in quantifying social and economic stress. Determining a prioritization of use at the watershed level was also difficult because it equated to valuing individuals livelihood choices. The general belief was that across the board reductions should be implemented instead of restricting a few water takers. Member of the WRT saw value in participating on the WRT, but also appeared to have individual conflicts with some of the outcomes, in particular being told not to irrigate and a Level 3 not being declared in 2007.

## **5.4 Grand River Watershed**

The IAD framework's action arena and patterns of interaction are used to discuss the structure of decision-making in the WRT and the reaction of water users locally. The watershed and individual scales shed light on how the provincial government incorporates outcomes from the WRT into final decision-making. Implementation and WRT member inclusion and satisfaction will provide insight into whether the government is respecting the outcomes from WRTs. Level 3 is the core of analysis for determining whether outcomes are protected. Therefore, the necessary documentation and prioritization for use was the focus.

### **5.4.1 Watershed**

The IAD framework will overview the structure, decision-making and outcomes of the WRT. The outcomes of the WRT are used to inform decision-making at the provincial level and affect the actions of water users at the individual scale. See Table 5.6 for the data of the action arena rules as they pertain to the Grand River watershed.

**Table 5.6: Action Arena**

<b>Rule</b>	<b>Findings</b>
<b>Position</b>	<ul style="list-style-type: none"> <li>• The participants involved in the WRT are numerous and diverse.</li> <li>• Agriculture representatives are key actors in some subwatersheds, but there are also golf course representatives, aggregate, recreational users, First Nation representation and industry.</li> <li>• Municipalities are the largest water user in the watershed.</li> <li>• There are many small municipalities in the Grand River watershed.</li> </ul>
<b>Scope</b>	<ul style="list-style-type: none"> <li>• Members are expected to promote voluntary water reductions and provide recommendations to the WRT.</li> <li>• WRT declare Level 1 and 2.</li> <li>• Recommend declaring a Level 3 to the OWDC.</li> </ul>
<b>Authority</b>	<ul style="list-style-type: none"> <li>• WRT members attend meetings, communicate information discussed with respective sectors, share data and provide a responsible response to low water conditions.</li> <li>• The team meets through teleconference as required, which is often weekly during dry weather and they try to have one face to face meeting early in the year.</li> <li>• A conservation authority representative co-chairs the WRT and is responsible for measuring and providing indicators for precipitation and flow.</li> <li>• Municipalities attend meetings and provide context for water withdraw.</li> <li>• Water users provide context and conservation strategies from their sector.</li> </ul>
<b>Information</b>	<ul style="list-style-type: none"> <li>• GRCA depends on partner support for operations, which is reflected in LWR.</li> <li>• Open discussion with participation from all stakeholders is typical of WRT meetings.</li> <li>• The watershed is spatially large and often there will be different issues and declared levels in subwatersheds.</li> <li>• All issues are discussed on one call and participants are informed of issues throughout the watershed.</li> <li>• The team works together to build cooperative relationships instead of just relying on government applying restrictions.</li> </ul>
<b>Boundary</b>	<ul style="list-style-type: none"> <li>• Conservation authorities, government and municipalities take part in LWR as part of employment duties.</li> <li>• Representatives from different sectors are asked to participate, but it is completely voluntary.</li> </ul>
<b>Aggregation</b>	<ul style="list-style-type: none"> <li>• Decisions made through consensus.</li> <li>• All participants share the same responsibilities except for provincial government who are non-voting.</li> </ul>
<b>Payoff</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily reduce water use at Level 1 and 2.</li> </ul>

The responsibility of the Grand River WRT and the roles of individual participants largely conform to the specifications outlined in the LWR program. The WRT coordinates short term activities during dry conditions to ensure “balance[d] efficient use, protection of the resource and



equity among users” (Grand River Conservation Authority 2011, 1). The watershed is large and includes diverse water use sectors, which requires broad participation. The size and diversity also result in meetings taking place through teleconference to ensure participants can more easily take part. The fact that a provincial representative interacts with the provincial level is significant, but may be necessary for ease of operation because they are familiar with government practices.

#### 5.4.1.1 Patterns of Interaction

The Grand River WRT is a diverse group. The WRT works well together and debates opinions openly, as expressed in the following quotation from Respondent 15, “I think you find that we get very open and honest participation in our groups we try to make a point of being very inclusive because we do have a very diverse water using sector it is numerous and large”. The team understands that water users in subwatersheds may need to support Level 1 declaration due to issues in other subwatersheds and respects making voluntary reductions to support other team members circumstances. Respondent 19 pointed out that this “help[s] essentially build that social and community capacity that we are seeing ... there is greater awareness there is greater perspective of the need to implement an interim response”.

#### 5.4.2 Individual

The individual scale underscores the actions of water users affected by low water decisions made at the watershed scale. Individuals can also provide feedback to the provincial scale by the actions they choose to take or through direct communication. The action arena examines how water users reacted to the decisions of the WRT and whether outcomes were implemented and if water users were satisfied by outcomes from the WRT. Figure 5.7 outlines the findings from the action arena.

**Table 5.7: Action Arena**

<b>Rule</b>	<b>Findings</b>
<b>Position</b>	<ul style="list-style-type: none"> <li>• Everyone with a PTTW or individuals in sectors involved in WRT (including community members).</li> </ul>
<b>Scope</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily reduce water use at Level 1 and 2.</li> </ul>
<b>Authority</b>	<ul style="list-style-type: none"> <li>• Conservation authorities can adjust reservoir reserves to bolster the flows of rivers, streams and creeks.</li> <li>• Municipalities enforce bylaws during low water conditions.</li> <li>• Water users voluntarily reduce water use and spread word of reductions to their sector.</li> </ul>
<b>Information</b>	<ul style="list-style-type: none"> <li>• Municipal and conservation authority messaging in the watershed is locally focused.</li> <li>• Water users share reduction strategies within their sector.</li> </ul>
<b>Boundary</b>	<ul style="list-style-type: none"> <li>• Involvement is purely voluntary and depends on the operation and the source of water.</li> </ul>
<b>Aggregation</b>	<ul style="list-style-type: none"> <li>• Participation in water reduction is strictly voluntary.</li> </ul>
<b>Payoff</b>	<ul style="list-style-type: none"> <li>• Water users voluntarily reduce water use at Level 1 and 2.</li> </ul>

The voluntary nature of water reductions at Level 1 and 2 makes it difficult to directly measure conservation efforts and the impact that water reductions have on the natural environment. The Grand River watershed has a number of areas that experience frequent low water conditions, including Whitemans Creek and the Speed and Eramosa Rivers. Municipalities and the conservation authority can take actions to reduce the impact of low water through water management actions, such as reservoir drawdown. These actions can provide short-term relief that reduces the need to declare a Level 3, but may not be sustainable in long-term drought conditions.

#### **5.4.2.1 Patterns of Interaction**

There is a wide variety of responses from corporate or industrial water users. Some industries have multiple strategies for ensuring compliance and work to be good corporate citizens, but others are not inclined to reduce water use. This may be due to the type of industry and the extent their actions are visible to the public. Respondents 11 and 12 expressed that there are many misconceptions about large water users that may stem from the media or community action groups. These respondents thought that education is needed to stop misconceptions. Golf courses, noted Respondent 09, may be understood by the public as an aesthetic use, but they generate jobs in the community and provide opportunities for recreation and leisure.

Document analysis revealed that farmers in the Grand River believed that Irrigation Advisory Committees could be beneficial for reducing water use in high stress areas, but “in practice they are not realistic” (Grand River Conservation Authority 2008, 37). “When the farmer’s livelihood is at stake, the call from another farmer to cut back on water use isn’t going to change their watering schedule” (Grand River Conservation Authority 2008, 37).

In Grand River watershed there have been observed changes to social norms of the general public. In response to water use reduction bylaws, Respondent 19 noted that “we are seeing 60 or 65 percent of households saying that they don’t water their lawn any longer”. Not watering a lawn during low water conditions can be a point of pride for homeowners and they can pressure neighbours to reduce their outside water use. However, during water restrictions it is difficult to enforce public cutbacks while large water users are visibly using water. Anglers near Whitemans Creek who are asked to comply with restrictions during low water find it difficult to adhere to restriction if it appears that agricultural water withdrawals in the area are continuing unhampered (Grand River Conservation Authority 2008). Voluntary measures of compliance and alternative water sources should be better communicated to ensure respected compliance and maintain cordial relations between water takers and recreational water users, such as anglers (Grand River Conservation Authority 2008).

#### **5.4.3 Outcomes**

Subwatershed in Grand River watershed experienced Level 3 conditions in 2007 and 2012. In 2007 the team recommended that the OWDC designate Level 3, whereas in 2012 the team simply informed the OWDC that Level 3 indicators were present in the watershed, but did not recommend a Level 3 declaration. The OWDC did not declare a Level 3 in 2007. However, the decision took three weeks and by the time it was reached the low water situation had resolved itself.

#### **5.4.4 Implementation**

Data analysis revealed that the LWR program is an appropriate strategy for reacting to low water conditions. “We actually have a program that is around 13-14 years old now and it still works” (Respondent 15). The benefit of using a collaborative approach for decision-making was also recognized by Respondent 09 who believed that getting the buy-in of participants allowed for greater impact than imposing restrictions. Two respondents believed that the WRT was effective in coming to consensus on decisions and spreading word of the decisions reached (15 and 10). The approach, Respondent 09 believed, successfully incorporated different types of water users and created concern about the effects of low water on all sectors.

In terms of implementing Level 3, Respondent 15 recognized that it is a difficult political decision because it would result in heavy enforcement, which is unpopular with water users who need access to water resources. “They had a real reluctance to ... tell people to cut back. Now you are getting into the real political fire storm and that is the type of thing where if you want to enact tough legislation ... there are political consequences”. Another perspective was that the LWR process is a scientific process and indicator based so coming to a conclusion is relatively easy without fostering resentment among team members (Respondents 10 and 11). This leads to the belief that Level 3 had not been declared because it was not warranted by the science-based evidence.

Grand River has a few subwatersheds that enter Level 3 conditions regularly. However, Level 3 is supposed to represent an imperiled supply and an emergency situation. This highlights the need for indicators that specify unusually low water levels that are locally sensitive and the need for localized funding to support areas that have more frequent low water conditions. Several agencies have tried to persuade water users, especially agricultural users, in subwatersheds that experience more frequent low water conditions to invest in off-source supplies of water (Kovacs 2013). Respondent 15 noted there is a balance between dealing with emergency and preparing ourselves to make sure we have resilience so we are not getting into emergency. There needs to be a clearer response from the province to low water, and more rapid decision making. Respondent 15 went on to compare the emergency response of LWR to the emergency response of fighting a fire by saying “when you call 911 ... to put out a fire they don’t scratch their heads and think ‘oh boy does anybody have a road map or ... does anyone remember where we put the hoses you know (snap) you’re there you’re in the truck responding”.

##### **5.4.4.1 Documented conservation and reduction efforts**

There are often company based water management strategies to limit water taking that are aimed at protecting water resources, which was pointed out by Respondent 10. These come into effect even without a level being declared. Respondent 09 also noted that most water users expect Level 1 or 2 declarations because they can observe low water conditions and understand the need to voluntarily reduce water taking.

Establishing a secure water source – through creating an irrigation pond or investing in efficient technology – is part of adaptive thinking and will be beneficial in the future as a backup plan during low water conditions (Kovacs 2013). Voluntary reduction at an equal rate for all users may not be fair (Grand River Conservation Authority 2008). If users have developed alternative management plans, or invested in efficient machinery, then they have already cut back water use, which reduces water use at all times instead of just in crisis times. It is important to

build alternatives and to discuss reduction before low water conditions arise so that in times of crisis there is a plan of action. Water users in general are creating effective water management plans and investing in efficient equipment (Grand River Conservation Authority 2008). It is increasingly difficult to meet voluntary reduction because, as Respondent 15 pointed out, “when the time comes to go that extra mile it is not as easy you know the fats been cut off the bone”. Efficiency in machinery and management practices is the ultimate goal for water users because it reduces costs by minimizing fuel use and water loss. This encourages constant water conservation instead of conservation during crisis. Respondent 15 noted that “the problem is when you get into a program like this one that has evolved and developed and matured over you know 10-15 year period where the strategy was cut back 10%, cut back 20% over time the baseline keeps dropping”. This means that it can be increasingly difficult to meet voluntary reduction targets as efficiency improves.

In the agricultural sector, most farmers have wise use management plans for efficient water use that have emerged through changing industry standards and economic need. Farmers reported at a workshop that they do not waste water (Grand River Conservation Authority 2008). Irrigation is expensive and stressful for farmers and they only use it when necessary. However, the necessity to water at certain times limits the ability of farmers to reduce their usage during levels because if they do not water they will be behind on watering needs, which could imperil the crop (Grand River Conservation Authority 2008). Respondent 15 elaborated on a potential situation by saying “telling a farmer not to use as much water, they will mentally do the math and say ... ‘if you are going to fine me I will work out the cost of the fine and I will pay the fine because it is cheaper than losing my whole year’s crop”.

Municipal officials also heard complaints about individuals watering their lawn despite restrictions. However, overall municipalities report a reduction on demand during Level 1 and 2. A survey in the Whitemans Creek pilot project reported that most respondents were aware of the level changes and request for voluntary reductions (Grand River Conservation Authority 2008). About half reported reducing their water use and most of the other half reported using conservation measures in regular management.

#### **5.4.4.2 Documented social, environmental and economic impact**

In the Level 3 pilot project, of the farmers who were surveyed, most reported that they did not have supply issues in the summer of 2007. However, some reported crop loss and reduced value of crops. Personal stress was also reported as a byproduct of the dry conditions.

If Level 3 was designated and mandatory water cutbacks were enforced it is likely that business would suffer economically (Grand River Conservation Authority 2008). Farmers in particular would have a high likelihood of losing the income from that year’s crop. Depending on the crop there might be detrimental impacts on future growth resulting from drought impacts. For example, blueberries are susceptible to this kind of stress. It was also believed that if a Level 3 was designated provisions for compensation for lost profit should be included in planning. Long-term property value was called into question if Level 3 was declared and future land buyers could expect hindrances on accessing water (Grand River Conservation Authority 2008).

One of the challenges identified was that the WRT had put together the necessary documents to support a Level 3 declaration and the role of the OWDC is to act on their recommendations. However, Respondent 19 pointed out that the degree of information and level

of involvement required from the WRT was largely unknown while making recommendations to the OWDC. The view expressed was that the respondent “would like to see some clear protocol about essentially how does that decision happen and I think it would certainly add some transparency to the process”.

It is difficult to quickly gather information on economic and social impacts to low water (Respondent 15). Furthermore, it is difficult to quantify these impacts. However, a quick reaction is necessary in order to stop detrimental impacts. Respondent 15 pointed out that “The way it was set up it was very difficult to get a quick response and the type of information we were gathering ... it took way too long and by the time we got everything together the situation was basically gone or the types of threats that you were trying to deal with had either created a problem or resolved themselves”.

#### **5.4.4.3 Recommendations on Prioritization of Use**

The GRCA attempted to value crops in an effort to understand how to prioritize different sectors within agriculture (Grand River Conservation Authority 2008). However, the process revealed that it is difficult to use crop valuation as a factor of prioritization because the livelihoods of farmers will be imperiled if their crop is valued as less important. Furthermore, the type of crops grown is dependent on farmer expertise, soil type, market demand, etc. and it is not the business of non-farmers to judge the type of crops individuals decide to grow (Respondent 15). The water use reductions at Level 3 were recommended to be more effective if they are implemented across all users as oppose to highlighting a few non-priorities (Grand River Conservation Authority 2008).

#### **5.4.5 Stakeholder Inclusion and Satisfaction with Outcomes**

Evidence from interviews suggests that local knowledge was respected in decision-making. Respondent 19 believed that “there is a feeling that we can inform what a response might look like in our individual communities knowing what we do about our systems or the nature of peak demand”. The same respondent also appreciated being involved in an initiative that provides something tangible: “it helps to reinforce some of the communication locally and provide something that is really tangible”.

Through communication on the WRT there has been improved understanding among water users in the case study area. Respondent 15 noted that “I think we have developed a much better understanding of who does what and why, which helps us to maybe approach resolution of the problem in a different way”. Evidence from interviews suggested that a valuable outcome was that participating in LWR creates many opportunities to communicate with other water users in the region, which would otherwise not happen. Respondent 10 expanded on this point by saying “tremendously valuable. You know for no other reason the power of networking bringing the brightest minds together in the Region to talk about what is going on ... it is a real resource”.

#### **5.4.6 Summary**

The WRT is arranged and functions in accordance with the specifications discussed in the LWR program. Participants share best management practices within water use sectors. The importance of adapting water use to the potential for low water conditions was noted as valuable for individual water users. Many water users have created adaptive management plans for

reducing water in order to save money and time. However, it is difficult to further reduce water during Level 1 and 2 with efficient water management strategies. There are misconceptions in the public about some large use water sectors. Increased education is required to inform the public on the practices and conservation strategies of large water users. However, the public is increasingly aware of the need to alter their personal water consumption practices and conservation is emerging as a social value. LWR was identified as a beneficial program for effectively reacting to low water conditions. A main outcome from participating in the WRT is increased communication, which leads to better and informed decisions.

A number of subwatersheds in the Grand River experience frequent low water conditions that exhibit Level 3 characteristics. This demonstrates the need to clarify and improve indicators in these regions to understand when an emergency happens and to localize funding in these areas to support a response. Respondents also noted the necessity of a faster response from the OWDC to designate Level 3 conditions or decide a designation is unwarranted. Most water users have conservation strategies and recognize the importance of protecting and sharing water resources.

During the low water conditions in 2007 most water users reported the ability to access required water, but some farmers reported crop loss, reduced crop value and emotional stress from low water (Grand River Conservation Authority 2008). If Level 3 is designated, it was reported as likely that there would be detrimental economic impact and it was hoped that compensation would be part of declaring a Level 3. Respondents noted that it is difficult to gather the necessary documentation for supporting a Level 3 declaration. The GRCA attempted to create a priority of use among agricultural sectors through economic valuation. However, it is difficult to determine a prioritization of use because livelihood is always at stake. The required information for recommending a Level 3 for the first time was not clearly understood. A framework needs to be determined to guide WRTs on the necessary components of recommending a Level 3.

## **5.5 Cross-Case Analysis**

The case study approach provided strong evidence that government incorporates all WRT decisions the same way. The LWR program explicitly lays out the design of how groups are formed and how the group interacts with government, which is adhered to in practice. At the provincial scale all of the rules were adhered to in practice as they are outlined in the LWR program. At the watershed level the case studies conformed to the decision-making rules outlined in the LWR document, except Catfish Creek and Nottawasaga Valley noted a limited role for municipalities and expressed difficulty in farmers being able to attend meetings. It is likely that all WRTs have provincial representatives as the intermediary between the watershed scale and the provincial scale. The rules for individuals at the local level were performed largely as expected. However, water users may decide the cost of reducing water use is not prudent for their business operations.

Information is the main deliverable that WRTs supply to the OWDC. This does not represent a major shift in the way government decisions are made or how government functions; it maintains a hierarchical relationship where the provincial government maintains control over final decision-making. However, there is evidence that collaborative approaches to environmental decision-making provide opportunities for improving the relationships between government officials and water users, which can harbour mutual respect and trust.

In the Catfish Creek case, WRT members interviewed for the study seemed to be pleased with the outcome protection measures supplied by the government. However, their WRT has not gone through the process of applying for a Level 3 declaration. When Level 3 conditions were met the team decided to inform the OWDC that Level 3 conditions were present, but did not recommend declaring Level 3. However, in Nottawasaga Valley and Grand River the process of trying to move forward through a Level 3 declaration process was very frustrating according to interview subjects. It took a lot of time and expertise to put together a report outlining the required support for declaring Level 3. The OWDC, in the case of respondents from Nottawasaga Valley and Grand River, took too much time to reach a decision. In these cases, WRT respondents believed that the province had not respected the opinions of the WRTs and had failed to make timely decisions, which was detrimental for effective drought planning. The sense that the government was not fulfilling its responsibilities was more explicit in Nottawasaga Valley, where respondents called into question the purpose of the WRT and the commitment of the government to protecting the environment from low water conditions. In the Grand River case there was more emphasis on improving the role of indicators to measure when emergency situations had been reached, the need for a clearer framework outlining what is expected of WRTs at Level 3, and transparency in how OWDC decisions are made.

The responses' from government participants focused on whether the conditions for Level 3 have actually been met in Ontario. Water management efforts can largely supplement low flows and ensure water users have access to water. The government is reluctant to unnecessarily restrict water user's access to water and can use the threat of declaring Level 3 to spur individual water reduction and conservation efforts before an emergency situation.

## **5.6 Summary**

As outlined in Chapter 3, the case studies were compared to determine whether WRTs had similar experiences with government incorporating outcomes in final decision-making and the extent government protected the outcomes from collaborative groups. Interviews were essential for understanding the perspectives of members of the WRT. Document analysis and observation supplemented the finding from interviews and provided other perspectives that were missed.

The comparison of cases revealed that WRTs face many of the same opportunities and challenges in making decisions about low water. Collaboration has increased communication between water users and enforcement agencies and among water users, which has resulted in beneficial relationships. These relationships have created opportunities to share best management practices for conserving water. The process has also created acceptance among different sectors that require water. Some of the challenges that WRTs face are based on the nature of responding to low water. It is relatively easy to voluntarily reduce water during Level 1 and 2, but when the situation is more dire it becomes difficult. There is also little time for improving planning outside of low water conditions so it can be stressful or rushed.

The process to declare a Level 3 has many hurdles that are acknowledged by all actors in LWR. First, there is not the capacity to supply the required documents the OWDC need to designate a Level 3. There are also large unknowns about exactly what is required in documentation, how it should be measured and how the OWDC make decisions about tradeoffs between economic and environmental factors. There were important differences among case studies regarding the degree to which it was felt outcomes were protected. If the process to

recommend a Level 3 has not been experienced, such as in Catfish Creek, it is likely that the WRT will be pleased with outcomes. Whereas the process of declaring Level 3 can increase the sentiment that outcomes are not being protected, especially if environmental impacts are evident.



## Chapter 6

### Discussion and Conclusions

The purpose of this research was to understand how the outcomes from collaborative processes are incorporated into government decision-making and to assess the extent government is protecting outcomes from collaborative groups. This research examined these issues through a case study of LWR in Ontario. The IAD framework, supported with indicators from the collaborative governance and environmental management literatures, was used as a conceptual framework to guide research. This chapter discusses key findings and the implications of this research for designing collaborative approaches for informing environmental decision-making. Chapter 6 also presents limitations of this study and opportunities for future research.

#### 6.1 Summary of Key Findings

Collaborative approaches for environmental decision-making are increasingly being used by government (Emerson, *et al.* 2012; Lockwood, *et al.* 2010; Robinson, *et al.* 2011). Therefore, it is essential to understand how governments use these initiatives for decision-making and whether collaboratively-produced outcomes are protected. Challenges have begun to emerge from the practice of governments using collaborative approaches for decision-making. One significant challenge is that there is a gap between collaborative groups providing recommendations to government and those recommendations being integrated in final decisions by governments. This lack of transparency in how outcomes from collaborative groups are used can result in adversarial relationships forming between government and members of the collaborative decision-making group if the members of those groups believe their decisions are undervalued or ignored. If participants believe that their input is not being incorporated into decision-making, then they may view the collaborative process as a guise that does not actually reflect public input (Kallis, *et al.* 2009) and they may raise barriers to future implementation surrounding the issue (Richie, *et al.* 2012).

There is disagreement in the literature about the role that collaborative approaches play in evolving environmental institutions and norms for public consultation (Newell, *et al.* 2012; Watson, *et al.* 2009). Clarifying the roles that collaborative approaches play in informing environmental management and policy will assist in managing expectations for what can be achieved through collaborative means. Furthermore, how governments use outcomes from collaborative approaches should be clarified early in the process and communicated with members of the collaborative group.

#### 6.2 Incorporating Collaborative Outcomes in Government Decisions

This research had two main purposes; the first was to understand how outcomes from collaborative bodies are incorporated into government decision-making. A number of findings emerged that contribute to understanding how collaborative processes are used by governments, which adds to the general literature on collaborative governance and recommendations for practice.

In LWR the role of government is not being reduced through collaborative processes. Government informs the process and has control over whether to designate a Level 3. The case of LWR in Ontario supports the view that collaborative approaches are not creating transformational change in government decision-making as debated in the collaborative governance literature (Newell, *et al.* 2012; Watson, *et al.* 2009). Provincial representatives are responsible for the highest level of decision-making and rely on collaborative bodies to provide input and recommendations into their decisions. However, the recommendations do not necessarily reflect the decisions ultimately made by the government.

In this case the collaborative process did not represent institutional overlay as discussed by Biermann, *et al.* (2007) and Meadowcroft (2007). The collaborative process provided additional benefits that would not have been produced through conventional government processes. The use of WRTs increased communication among water users, which led to better understanding among team members and cordial relations. Many water users were persuaded to implement initial or better water management protocols, which may be due to the collaborative process or it may be a sign of adapting to a changing economic climate. Importantly, individual water users began to see their water use as part of a collective impact on the watershed scale.

### **6.3 The Extent Government is Protecting Outcomes**

The second purpose of this research was to determine the extent government is protecting the outcomes from collaborative approaches to decision-making. The findings that discuss the extent to which government is protecting the outcomes cannot be generalized for all WRTs in Ontario. Each WRT had a different reaction to Level 3 not being designated and the Level 3 process in general.

The evidence suggests that outcomes are largely being protected through LWR. This is largely due to the nature of the collaborative process being action-focused for local participants, and the direct role they play in implementation. However, as was mentioned in Chapter 2, devolving implementation tasks can lead to accountability deficiencies (Australian Public Service Commission 2009; Watson, *et al.* 2009). Although most participants are largely pleased with the outcomes of WRTs, the continued absence of a Level 3 declaration weighs on the effectiveness of the program. The research suggests that over time, displeasure could build among WRTs that continue to experience drastic and prolonged low water conditions without a Level 3 declaration.

Similar challenges were identified in each case study for recommending the OWDC designate a Level 3. The additional measures that required documentation beyond physical indicators for stream flow and precipitation were difficult, time-consuming and expensive to collect. The need for WRTs to document reductions at Level 1 and 2 was identified as a major hurdle given the voluntary nature of the program. One concern raised was that water users may not report reducing water use during Level 1 and 2 to avoid restrictions at Level 3, although this was not apparent in case studies. The requirement to document social, economic and environmental impact is also challenging. It is easy to measure environmental impact, but documenting social and economic impacts is difficult especially because the expertise in conservation authorities is largely focused on biophysical conditions as oppose to social science. Furthermore, the specific information that is required for a successful recommendation to OWDC is not well understood.

Some of the reasons for the OWDC not declaring a Level 3 are program-specific. Level 3 is supposed to be an ‘emergency’ protocol. One of the indicators required for declaring a Level 3 is demonstrating social, environmental and economic harm. However, there are already tools in place to prevent these damages during ‘normal’ water levels through the PTTW administered by the MOE. In the data collected for this study, there is evidence suggesting that an emergency situation has never happened because there are actions that can mitigate the impact of low water, such as drawing down reservoirs to supplement natural flows. On the other hand the purpose of the WRTs is to represent the local reality. If the team believes that levels will have a harmful impact, some WRT members felt it was up to the government to respect the decision of the WRT because the government mandated them this role. Furthermore, in the case of extreme drought water management actions to control low water are only beneficial for short-term low water episodes where there is still water in reservoirs to manage.

A Level 3 may never be designated until the uncertainties surrounding the prioritization of use are resolved. Members of the WRTs in Nottawasaga Valley and Grand River expressed the need for a framework that outlines the necessary steps for recommending a Level 3 and transparency of the OWDC process for evaluating the recommendation. The initial steps of this process have begun through the pilot studies lead by GRCA and NVCA, but more work is required to fully understand how to prioritize use. The OWDC believe that the WRTs should inform a prioritization of use while all three WRTs believe that prioritization should be a provincial government responsibility. Locally deciding on a prioritization of use is difficult because the decisions would harm individual livelihoods; there may be team biases based on who is at the table and uncertainties of whether participants represent an individual or a community of practice; and challenges of having the capacity to determine a method for prioritizing use. These concerns point to the potential for accountability issues if a small group of people is responsible for prioritizing water use because the decisions may not be impartial.

Environmental indicators, such as stream flow and precipitation, are easy to measure to support a Level 3, but appear to not carry much weight in the final decision of the OWDC. Members of the LWR team have highlighted the negative impacts to aquatic ecosystems from low water conditions. Despite the level of awareness of the environmental effects from low water, specific knowledge as to how the ecosystem will rebound requires further study. Without understanding the implications of frequent low water conditions in aquatic ecosystems the necessity of declaring a Level 3 to protect health of streams will be in question. The other consideration is that the MOE can act to restrict water taking outside of a Level 3 due to the conditions laid out in permits. If there are low flows in tributaries that have withdrawals from water users with permits, their takings (or unpermitted takings) can be reduced due to the impact they are creating on the natural environment. The MOE has the regulatory power and tools to restrict water uses that have a detrimental impact on the environment.

The case of LWR in Ontario appears to focus on the individual scale for protecting the outcomes at least at Level 1 and 2. This might explain why Level 1 and 2 are so successful: local actors implement local solutions. However, designating a Level 3 requires restricting access to water, which in the past has led to contentious relations between water users and government. The government also works to create business opportunities for economic growth, which requires full access to resources, such as water. By shifting the responsibility to WRTs to determine when and what water users should be impacted by restrictions, I believe through evaluation of the evidence that the government is attempting to remove itself from complex decisions.

## 6.4 Case-specific Recommendations

This research provided the opportunity for multiple actors engaged in LWR to express their experiences and recommendations for improving the program. These recommendations, along with findings from this research, illuminate a number of suggestions that could benefit planning for low water conditions in Ontario.

The purpose of the LWR program is to provide local, short-term management of low water conditions. However, LWR, in conjunction with other programs and initiatives that promote sustainable water resource practices, has resulted in long-term adaptive planning. Many water users in Ontario have moved all or some of their water taking off of surface water sources. Some surface water sources that once experienced regular low water conditions (particularly around the Catfish Creek watershed) have been experiencing fewer and less drastic low water episodes since the beginning of the LWR program and the incentives for moving water taking off source water. If the long term could be taken into consideration during LWR planning and WRT meetings these benefits could have a greater, more directed impact. The lack of future planning and management in LWR is one of the gaps of the program.

Overall, the LWR program is effective at Level 1 and 2. Furthermore participant inclusion at Level 1 and Level 2 are beneficial for alleviating low water conditions and for making actors feel like a valued part of the process. Water users have also started to shift their perspectives of the impact of their water taking from individual impact to collective impact on the watershed from all users. These connections that are created during LWR are important aspects of future implementation. Ananda *et al.* (2009) discussed that just because outcomes – a Level 3 declaration in the case of LWR – are not achieved does not mean that the instructional structure is inefficient.

There appear to be skewed expectations held by governments and members of the WRT based on what collaborative processes will achieve. Some participants may believe that collaborative processes provide them the ability to set the decision, which is then implemented by government. Governments may believe that the collaborative body will provide advice closely aligned to their mandate that will be realistic and fair. Aligning expectations of what outcomes will be between government and participants is an important first steps in ensuring outcomes are protected.

Accountability in LWR needs to be further explored to understand who is responsible for fulfilling tasks, most notably the prioritization of use. To date low water conditions resulting in Level 3 indicators may be relatively easy to excuse based on lack of social and economic stress. If low water conditions similar to the experience of the late 1990's, that propelled the LWR program into existence, return a framework must be available to ameliorate some of the stress on water users and protect the environment. If this framework is not in place and the provincial government cannot deliver a collective premeditated response this will reflect a failure of preparation and may result in water users harboring adversarial relations toward government and other water users, as experienced in other case studies (Kallis, *et al.* 2009; Richie, *et al.* 2012). Accountability measures would ensure that actors know their role and have appropriate expectations for what can be achieved through collaborative approaches and resulting government action.

Accountability considerations may be one of the reasons government is reluctant to fully incorporate the recommendations made by WRTs. If the government believes that the recommendation to move to a Level 3 is not in the best interests of the public they may hesitate to implement the decision. As discussed by Schillemans (2008) there needs to be horizontal accountability to ensure that the decisions emerging from collaborative bodies take into consideration the needs of all instead of the opinions and needs of just water users.

## **6.5 Scholarly Contributions**

The purpose of this research was primarily to understand how collaborative outcomes are incorporated into government decision-making and to determine the extent governments are respecting the outcomes of collaborative approaches. Research into government-led collaborative approaches for decision-making contributes to the body of literature on collaborative governance and environmental management. Furthermore, practical contributions for government decision-makers and policy analysts were apparent.

The types of outcomes being produced may contribute to whether participants believe outcomes are being respected in collaborative approaches. For instance, examples from the literature on government not respecting outcomes tend to be policy or program focused. Therefore, if the recommendations from the collaborative body are not included in the final policy it would be more obvious that outcomes are not respected because the policy is the sole outcome. In terms of LWR the implementation at Level 1 and 2 have water users directly involved in water reductions and communicating with other members in their sector the importance of water conservation and efficiency. This represents more of an action focused outcome that has participants directly engaged in implementation. Participants may believe that their recommendations are not being respected by government on declaring a Level 3, but there are a number of other factors where there is government support and understanding, especially from provincial government members of the WRT.

By focusing on implementation it would appear that government is not respecting outcomes because a Level 3 was not declared in Nottawasaga Valley or Grand River despite the WRT's recommendation and observed environmental impacts. By investigating process and social outcomes, such as stakeholder inclusion and satisfaction in the process, it is more apparent that collaboration is producing outcomes that are beneficial for participants and protected by government. This highlights that including tangible as well as intangible outcome indicators is essential to understanding collaborative processes.

Practically, in government-led collaborative approaches to decision-making more emphasis needs to be placed on balancing expectations between government and members of collaborative groups. Governments need to consider what types of outcomes they require for making decisions and how the outcomes from collaborative groups will be incorporated into decision-making. These expectations need to be shared with the collaborative group in the early stages of its creation. The collaborative body should likewise be given the opportunity to explain their expectations for what the collaborative group will accomplish and how the government will respond. Greater communication between government and members of collaborative groups is required in the early stages of collaboration.

The perception of whether government is protecting outcomes from collaborative groups will change over time and may depend on key actors within the collaborative group. If there is an

outspoken member of a collaborative group that has the ability or power to sway others' perceptions that person may be able to ingrain a belief that the government is or is not respecting outcomes.

## 6.6 Limitations and Research Opportunities

Limitations that became evident during this research are discussed here to reveal the strengths and limitations of the study, and to highlight future opportunities for studying collaborative approaches to decision-making. First, this research used a small number of factors (implementation, stakeholder inclusion and satisfaction) for assessing how government uses the outcomes from collaborative groups and whether recommendations are used in final government decision-making. It tried to understand these few factors in-depth as opposed to exploring multiple factors on a surface level. It is possible that some of the indicators for whether government is respecting outcomes that were not explored would have indicated different findings. However, the tradeoff between breadth and depth is inherent in case study based research and there are pros and cons to each approach.

Second, it is likely that many of the respondents who were willing to discuss LWR in their spare time felt favourably towards the process. This may bias the research by exacerbating the positive aspects that were reported about LWR. However, the fact that all respondents felt favourably about the program in some respect is an indication that the program is successful, but it is still plausible that important perspectives were missed by individuals who did not self-select to take part in an interview.

Third, the absence of certain perspectives and spatial contexts was a limitation for understanding LWR in Ontario. The absence of opinions from water takers who are not on the WRT was a limitation for understanding the individual scale of analysis, but it was difficult to find contact information for water users that were not on the WRT. There was also a gap in the perspectives of provincial non-government participants in LWR. One respondent was from a non-governmental organizations operating at the provincial level, but different perspectives would have been beneficial. In order to supplement the non-governmental organization perspective documents were analyzed to try and understand the opinions of Level 3. Additionally, comparing the experiences in eastern and northern Ontario is an essential component of understanding LWR in Ontario. However, this was not possible given the breadth of analysis required and time commitment for understanding different regional experiences with LWR.

Finally, understanding how different actors (conservation authority, water user, municipality, or provincial government) perceive how collaboratively reached decisions are incorporated into government decision-making and whether outcomes are protected would have added depth to this research. However, this was unable to be accomplished during this research because of ethics constrictions. If the actor type of respondents was reported it would have been relatively easy to determine their identity given the WRT location. In the future including consent to report the actor group would be beneficial to add another layer of analysis. Understanding these limitations provides the opportunity for informing future studies into low water, collaborative processes for decisions-making and multi-level analysis.

The requirements of the MOE under the PTTW program requires further analysis to understand how water restrictions are enforced during normal water conditions compared to low

water conditions. The opportunity to use the PTTW program as a vehicle for a prioritization of use should be explored as suggested by the Environmental Commissioner of Ontario.

‘Government’ in this research was used primarily to refer to the provincial government. However, there are multiple government bodies operating at different scales. It would be interesting to investigate whether governments at various scales have a different understanding of the responsibility to protect outcomes and if their actions vary in collaborative approaches to decision-making.

As collaborative approaches to environmental decision-making continue to be used for government decision-making it is essential that the expectations of government are articulated. The participants in the collaborative process must also make their expectations known for what they believe their role should be and how outcomes will be used. There needs to be reciprocity between government and participants in collaborative approaches to decision-making. Ensuring that the government is treating the input from collaborative groups in a transparent manner is essential. Government may be using the input from collaborative processes, but the participants may believe their recommendations are ignored if they are not directly referenced in the final output. Steps to ensure that collaborative bodies are being accountable to the general public in informing government decisions would encourage broader uptake of collaboratively reached outcomes.

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## Appendix A: Interview Questions

### A) Relationships between actors in Low Water Response

- 1) What is the goal of the Water Response Team?
- 2) What is the role of (interviewees organization or water user) in the Water Response Team?
- 3) What is the relationship between the (interviewees organization or water user) and other actors involved in the water response team (such as other provincial ministries, conservation authority, municipalities, and water users)?
- 4) How does (interviewees organization or water user) interact with the Low Water Committee formed by the Ontario Water Director's committee?

### B) Outcome Protection

- 5) How is the work from the Water Response Team used by (interviewees organization or water user) for decision-making?
- 6) What are the outcomes from Low Water Response at each Level (1, 2, and 3)?
- 7) How are the outcomes from the Water Response team implemented (*who is in charge of implementation, how does it take place*)?
- 8) Do water users tend to respond to voluntary conservation during Level 1 and 2?
- 9) How does the WRT monitor their response to drought?
- 10) Were your views incorporated into WRT decision-making?
- 11) Do you believe outcomes were effective?

### C) Level 3 in Low Water Response

- 12) How does the WRT monitor their response to drought?
- 13) Have any of the watersheds you work with ever experienced Level 3 conditions?
- 14) If yes, why wasn't a Level 3 designated at that time?
- 15) Do you think this was the appropriate action?