



**CAPACITY AND CAPACITY-BUILDING NEEDS IN ALBERTA'S WATER
GOVERNANCE STRUCTURE**

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Abstract

In recent years Alberta's water management style has moved from government to governance. With this change in style, many questions around governance capacity and capacity-building needs arise. This thesis assessed the current capacity and capacity-building needs for water governance in Alberta as perceived by stakeholders directly involved in water governance. It was organized around two objectives. The first objective was to develop a conceptual framework of water governance capacity, based on the literature on capacity. The second objective was to conduct an assessment of stakeholders' perception of the current capacity and capacity-building needs for water governance. This was accomplished by using the conceptual framework to design questions for data collection, interviewing stakeholders, collecting pertinent government documents, and analyzing the collected data. The findings suggest that there are areas with capacity and areas that require capacity-building.

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1. Introduction

Water is a fundamental element to humans and the environment. Up until recent decades, water was managed solely for human needs (Holling, 2001; Heathcote, 2009; Russell & Baumann, 2009). Current practice has shifted management to an integrative, holistic or ecosystem approach (Holling, 2001; Mitchell, 2005; Heathcote, 2009; Russell & Baumann, 2009). This approach is complex as it incorporates an understanding of the interaction between water, its surrounding environmental or ecological system, and the socio-economic system (Holling, 2001; Mitchell, 2005; Medema, McIntosh, & Jeffrey, 2008; Heathcote, 2009). The complexity is great enough that it is difficult for any one entity to manage water in an effective or efficient manner (de Loë, Armitage, Plummer, Davidson, & Moraru, 2009). Instead, the elements of management are performed through a wide variety of individuals and institutions —many of whom/which are not government (de Loë et al., 2009).

This collective management is held together by a framework of procedures, practices, rules and regulations (social and legal, formal and informal) that becomes the governance structure (Sabatier et al., 2005; de Loë et al., 2009). The governance structure is under constant negotiation due to a need for a system response to public and stakeholder demands, a government responsibility for final decision-making, and a concern for cost of centralization and regulation (Sabatier et al., 2005). This shift is referred to as a shift from a top-down centralized management and regulation approach to a bottom-up multi-scale collaborative approach (Sabatier et al., 2005; Ansell & Gash, 2007). It is also referred to as a shift from government to governance (de Loë et al., 2009).

These shifts have created a need to understand and determine the capacity of institutions and organizations involved in water management to meet the changes demanded by this change from government to governance. An understanding of the capacity of the overall governance structure is also required. Capacity is a term most often used to describe a basic concept: the capability —actual or potential— of individuals, organizations and institutions, and society as a whole to perform, manage, solve, accomplish, or withstand determined objectives or situations (Franks, 1999; Teohareva, 2011). Understanding the current capacity of a system should lead to capacity-building events and exercises that increase the overall systems effectiveness and ability to better manage water.

The Province of Alberta is one of those jurisdictions which are undergoing the shift from government to governance. Its water governance structure has become complex. There are provincial and federal acts and policies, inter-provincial, provincial-territorial, and international agreements, and local government bylaws that govern the management and allocation of water. Direct participants in the water governance structure include government departments, government mandated agencies such as the Alberta Water Council (AWC) and the watershed planning and advisory committees (WPACs), non-profit organizations, and local watershed stewardship groups. Individuals, industries and businesses can and do participate by volunteering with or joining local watershed stewardship groups, government mandated agencies, and non-profit organizations. A diverse landscape and varying water needs —from the semi-arid, water-scarce southern Alberta with water allocation issues to water-rich northern Alberta with water quality issues caused by industrial use — also contribute to the complexity of water

management. As well, Alberta's water governance structure has been evolving over the past fifteen years to become more of a bottom-up collaborative approach rather than top-down approach to management (Alberta Environment, 2005). The direction for water resource management has been driven during this time by the *Water for Life* strategy (Alberta Environment, 2005).

Further complication comes from a new level added to the governance structure with the formation and implementation of the provincial government's *Land-use Framework*. The Government of Alberta (2012c) has stated this will be a centrally-organized system that will incorporate land, environment, economic and social needs into legislated regional plans. Watershed management plans are to be included as part of each regional plan and it is expected that water legislation, policies, and strategies are to inform the *Land-use Framework* (Government of Alberta, 2012d). It is not yet known how the *Land-use Framework* will impact the way water is currently governed in the province. Nor has there been any indication given on how a centrally-organized level of land-use governance will interact with a collaborative bottom-up approach to water management.

The shift from a top-down to a bottom-up approach to water management and a legislated mandate to incorporate water plans into provincial land use plans raises questions concerning the capacity of the governance structure. Do water institutions — local, regional, and provincial— have the capacity to meet their individual governance mandates? Does the overall water governance structure have the capacity to meet the water governance objectives and goals as outlined in the *Water for Life* strategy? Do the water governance structure and its water institutions have the capacity to meet new legislation to merge watershed plans into, as well as inform, the provincial *Land-use*

Framework? These questions revolve around the capacity or lack of capacity of the water governance structure.

The purpose of this thesis is to assess the current capacity and capacity-building needs for water governance in Alberta from the perspective of stakeholders directly involved in the water governance structure. This thesis is organized around two specific objectives. The first objective is to develop a conceptual framework of water governance capacity, based on capacity literature from disciplines such as natural resource management, community development, sociology, and geography. This heuristic device is used to inform the second empirical objective: to conduct an assessment of current water governance capacity and capacity-building needs perceived by participants in Alberta's water governance partnership. The research questions that needed to be answered in order to complete the second objective were 1) What capacity do stakeholders have? 2) Where is there a lack of capacity in water governance? 3) What tools or resources are needed to build capacity? and 4) Where should capacity be built? These questions were answered using the conceptual framework developed in the first objective to create the research design which involved interviewing key informants and analyzing key government water-related documents. It was conducted in three watershed basins —the South Saskatchewan River Basin, the North Saskatchewan River Basin, and the Athabasca River Basin.

The thesis begins with a brief context chapter providing the background for the current state of the provincial direction on governance. It is followed by a chapter that reviews the literature on capacity and capacity-building, along with the framework that heuristically informs the research design chapter. This is followed by the research design chapter that outlines the methodology, providing rationales for the research area

selection, participant selection, interview design and data analysis strategies. It also provides data management and ethics information. Chapter five provides the results of the research as well as discussions of findings. Finally, the thesis concludes with a review of the study's limitations and directions for future research.

2. Water Governance in Alberta

2.1 Introduction

This chapter provides the background to Alberta's water governance for the thesis topic. It gives the reader an understanding of the different types of stakeholders involved in water governance, and their roles. It also provides a background for the two main policy directives —the *Water for Life* strategy and the *Land-use Framework*— driving current water governance practices. It contains three sections beyond this introduction. Section 2.2 provides information on Alberta's water governance structure. Section 2.3 provides background for *Land-use Framework* for Alberta. It is followed by a section that outlines scale issues of management. It concludes with highlighting linkages between the background and the thesis objectives.

2.2 Water Governance Structure

In 1999 the Alberta Government proclaimed the Water Act, which was new legislation to update the Water Resources Act (1980). The Water Act required the province to develop a strategy for water management and planning and in 2002, the Alberta government, under Alberta Environment, released its strategy called *Water for Life* (Alberta Environment, 2002). The strategy also provided direction for a new approach to watershed management that incorporates a broader inclusion of stakeholders into the governance structure (Alberta Environment, 2005). The strategy provided mandates for a semi-hierarchical structure consisting of three types of partnerships, the Alberta Water Council (AWC), Watershed Planning and Advisory Councils (WPACs), and Local Watershed Stewardship Groups (LWSGs) (Alberta Environment, 2005).

The Alberta Water Council is a formal, closed, representative board that oversees research and provides direction to the government and to Watershed Planning and Advisory Councils, and is informed by the WPACs and the LWSGs (Alberta Environment, 2005). The Alberta Water Council has twenty-four directors representing different sectors. The Government of Alberta determines the allocation to each sector. There are eight seats for industry, seven seats for non-government organizations involved in environment and water issues, four seats for local government, and five seats for the provincial government (Alberta Water Council, 2012). The government invites select groups to fill the allocated seats. These groups can be industry associations, specific organizations or specific provincial representatives. When an association is invited, the association selects one individual and their alternate to represent the industry or non-profit sector (Alberta Environment, 2005).

Watershed Planning and Advisory Councils are formal, open organizations made up of local stakeholders and individuals who assess the watershed, develop the management plans, and conduct educational and stewardship activities in the watershed (Alberta Environment, 2005). WPAC boards are elected by the members and may have one or more provincial representatives (Alberta Environment, 2005). Watershed Planning and Advisory Councils are encouraged by the Government of Alberta to maintain a representative membership (Alberta Environment, 2005). By the end of 2011, there were eleven Watershed Planning and Advisory Councils and all were working on their State of the Watershed reports. Six WPACs have completed or are close to completing their Watershed Management Plans (Alberta Environment, 2012).

Local Watershed Stewardship Groups are community-based organizations (Alberta Environment, 2005). LWSGs are made up of local individuals and stakeholders who provide information to the WPACs and implement aspects of the management plans (Alberta Environment, 2005). There are over one hundred and twenty Local Watershed Stewardship Groups in operation across the province (Land Stewardship Centre of Canada, 2005). Local watershed partnership groups can be formal or informal, open or closed, representative or restricted, or any combination thereof (Alberta Environment, 2005; Bidwell & Ryan, 2006; Floress, Prokopy, & Allred, 2011). Formal groups are those with five or more members who have bylaws and mandates registered under the Societies Act, and which may or may not be registered as a charity and/or incorporated (Alberta Environment, 2005; Service Alberta, 2012). Informal groups are small, can access little or no government funding, have no formal board or bylaws, and might operate sporadically or short-term (Alberta Environment, 2005). Open groups are those which accept any interested citizen, while closed groups are limited to people or organizations that meet specific criteria and membership is appointed by the government or by board invitation (Alberta Environment, 2005; Floress et al., 2011). Representative groups attempt to balance the membership amongst a range of stakeholder interests (e.g. public, private, institutional) while restricted groups are composed of stakeholders with common attributes (e.g. land ownership) (Alberta Environment, 2005; Bidwell & Ryan, 2006; Floress et al., 2011).

2.3 Water and Alberta's Land-use Framework

While the *Water for Life* strategy was under way, the Government of Alberta, through its Sustainable Resource Development, introduced the Alberta Land Stewardship Act in

2009. The act mandates the government —through the Land Use Secretariat and using the *Land-use Framework*— to prepare regional, sub-regional, and issue-specific plans and amendments that incorporate economic, social, and environmental goals (Government of Alberta, 2012c). Currently, there are to be seven regional plans covering the Upper Peace Region, Lower Peace Region, Upper Athabasca Region, Lower Athabasca Region, the North Saskatchewan Region, the Red Deer Region, and the South Saskatchewan Region (see Figure 2.1 below) (Government of Alberta, 2012a). There are also to be three sub-region plans to cover Edmonton and area, Calgary and area, and the region encompassed by the Regional Municipality of Wood Buffalo (Government of Alberta, 2014). Three areas have also been identified for an issue-specific plan (Alberta Energy, 2014). These plans are called Comprehensive Regional Infrastructure Sustainability Plans (CRISP) and are to be developed for oils sands areas in Athabasca, Peace River and Cold Lake (Alberta Energy, 2014).

A project team consisting of representatives from government departments and government agencies will develop each regional plan with the Land Use Secretariat (Government of Alberta, 2009b, 2009a). Advice will be received from Regional Advisory Councils and through public consultation (Government of Alberta, 2009b, 2009a). Regional Advisory Councils are made up of members who have been appointed by the government and represent "a wide range of experience and expertise in the region" (Government of Alberta, 2011b). They are to provide advisory reports to the government based on their personal knowledge rather than from the perspective of their affiliated business, industry, or organization (Government of Alberta, 2011b). Out of the thirty-six members across two Regional Advisory Councils, two members (both on the South

Saskatchewan Regional Advisory Council) come directly from a water resource management background (Government of Alberta, 2011d, 2011c).

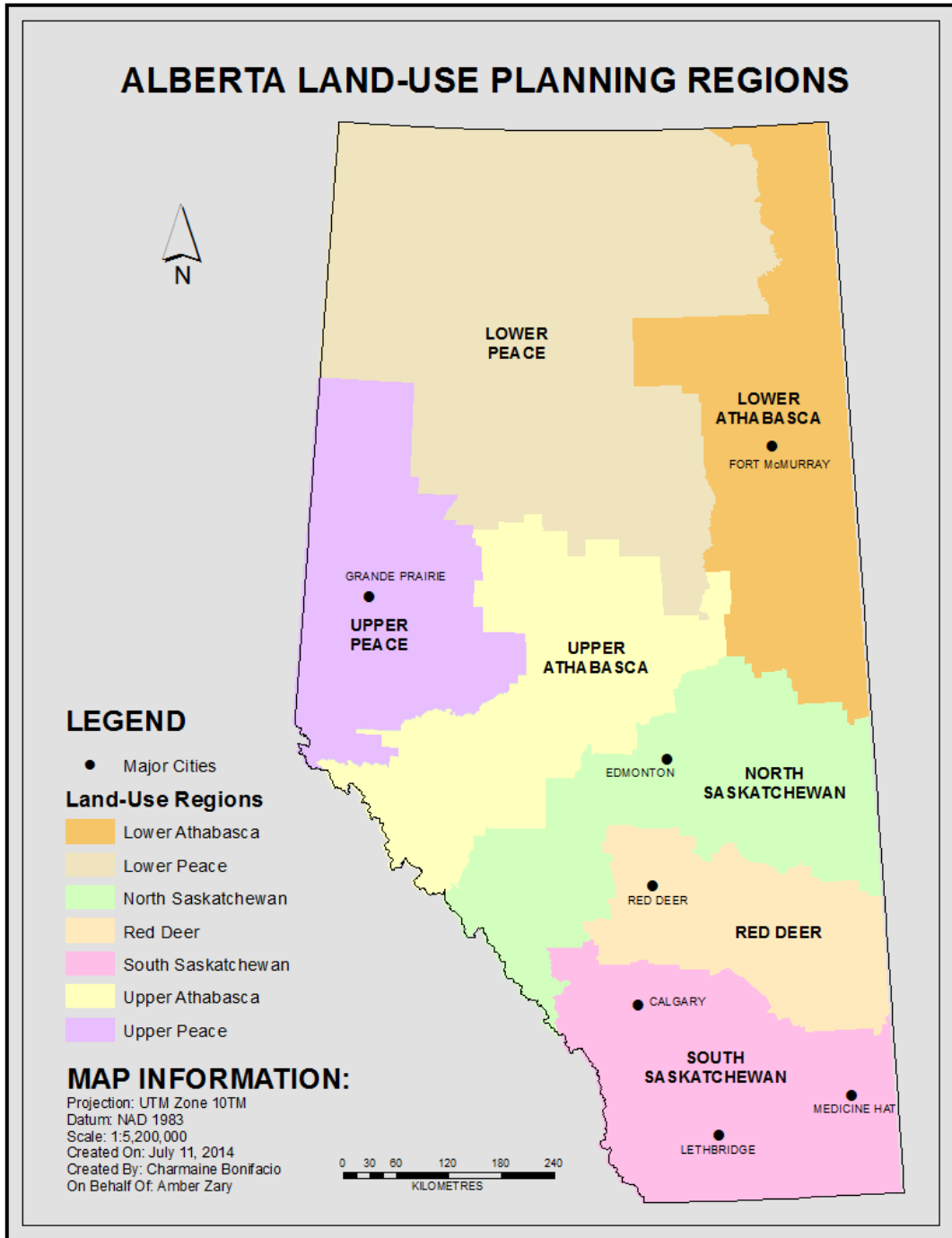


Figure 2.1: Alberta Land-use Planning Regions
Source: Based on AB LUF regional boundaries shapefiles 2011-04 from Government of Alberta.

Once the regional plans have been approved by the Cabinet, the plans will have regulatory status and all government departments, local governments, and residents of Alberta will be required to follow the plans (Government of Alberta, 2009b, 2009a). The *Land-use Framework* is to integrate the strategies and policies developed through other legislative acts that have impact on the human-environment relationship (Government of Alberta, 2012d). This includes the Watershed Management Plans created through the *Water for Life* strategy (Government of Alberta, 2012d). The Government of Alberta expects that the review of water allocation practices and policies and the development of a groundwater management framework will also inform the regional plans (Government of Alberta, 2009b).

To date there are two areas —the Lower Athabasca region and the South Saskatchewan Region— where a regional plan is under way. The Lower Athabasca region's Regional Advisory Council (LARAC) was created and Phase 1 of developing the regional plan was completed when it received its *Terms of Reference for Developing the Lower Athabasca Regional Plan* from the Government of Alberta in July of 2007 (Government of Alberta, 2009a). After public consultation, the second phase saw the LARAC develop a report, *Advice to the Government of Alberta Regarding a Vision for the Lower Athabasca Region*, in August of 2010 (Lower Athabasca Regional Advisory Council, 2010). Again following public consultation, the third phase of the regional plan was achieved with the release of the *Draft Lower Athabasca Integrated Regional Plan: 2011-2021: Strategic Plan Implementation Plan* in March of 2011 (Government of Alberta, 2011a). At the same time the report *Proposed Lower Athabasca Integrated Regional Plan Regulations* was also released (Government of Alberta, 2011e). On

August 22, 2012 the Lower Athabasca Regional Plan was approved and it went into effect on September 1, 2012 (Government of Alberta, 2012b).

The South Saskatchewan regional plan is not as far along in the process. The South Saskatchewan Regional Advisory Council (SSRAC) was formed in 2009 and it received its *Terms of Reference for Developing the South Saskatchewan Region* in November of 2009 (Government of Alberta, 2009b). After public consultation, the SSRAC released its report, *Advice to the Government of Alberta for the South Saskatchewan Regional Plan*, in February 2011 (South Saskatchewan Regional Advisory Council, 2011). The first draft of the plan was released in October 2013. Public consultation was completed by January 15, 2014 and the final draft regional plan is under way (Government of Alberta, 2012f).

The *Water for Life* strategy is to inform the *Land-use Framework*. This would assist in the shift to a more holistic approach to water management in that the strategy provides the information required about water issues and management practices to a Framework that is to encompass economic, social, and environmental needs of each region. While it is too early to judge the efficacy and outcomes of the Framework, one concern is the differences in management scale between the two policy documents.

2.4 Management Scale

One of the most significant shifts in water governance implemented through the *Water for Life* strategy is the delineation of management or governance areas using watershed boundaries (Alberta Environment, 2002; Government of Alberta, 2012a); eleven watersheds have been designated (Alberta Environment, 2002). These river basins and sub-basins are the Athabasca River Basin, Beaver River Basin, Bow River Sub-Basin, Buffalo River Basin, Hay River Basin, Milk River Basin, North Saskatchewan River

Basin, Oldman River Sub-Basin, Peace/Slave River Basin, Red Deer River Sub-Basin, and the South Saskatchewan Basin (Alberta Environment, 2002) (see Figure 2.2 below).

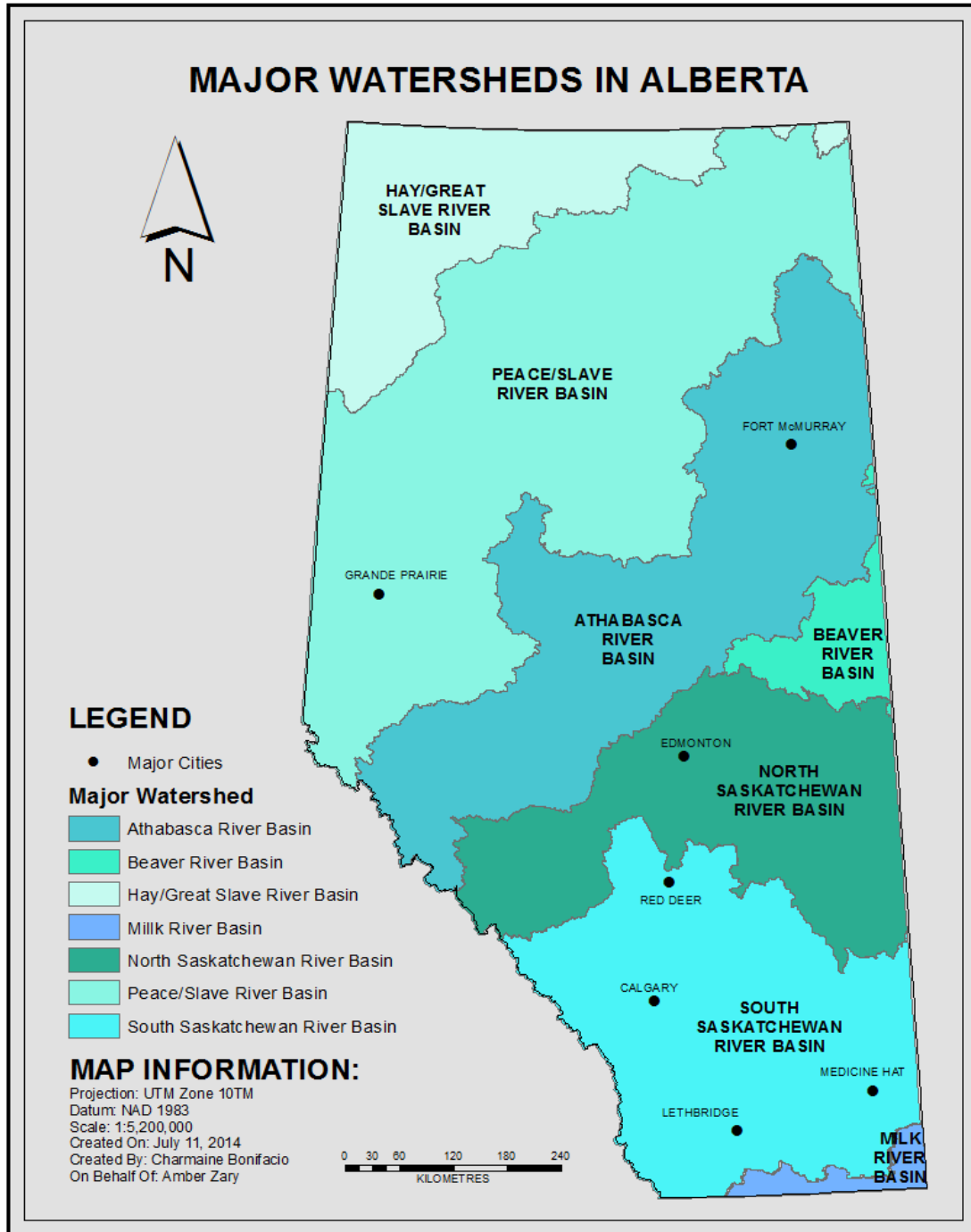


Figure 2.2: Major Watersheds in Alberta
 Source: Based on GeoGratis atlas of Canada 1, 000, 000 national frameworks data, hydrology-drainage areas for Alberta.

Each river basin and sub-basin faces pressures and demands on water. Examples of these pressures include areas of conflict among water users, allocation issues for citizens, agriculture, environment and industry, and issues around water quality (Alberta Environment, 2008). While each basin and sub-basin faces one or more of these issues, some issues are more predominant in some basins. For example, in the South Saskatchewan River Basin water issues around allocation and water quantity are high, whereas issues in the North Saskatchewan River Basin are around water conflict between new and existing development for access to groundwater and water quantity from groundwater, and the Peace/Slave River Basin faces water allocation and water quality issues for the environment that cross the borders of British Columbia and the Northwest Territories (Alberta Environment, 2006; WorleyParsons, 2009; Watrecon Consulting, 2012).

The *Land-use Framework* recognizes seven regions that loosely match seven watersheds of the Lower Peace, the Upper Peace, the Lower Athabasca, the Upper Athabasca, the North Saskatchewan, the Red Deer, and the South Saskatchewan basins (Government of Alberta, 2012a). There are also provisions for sub-regional plans, such as those to be developed for Edmonton and area, and for specific situations, such as the oil sands. These boundaries are not as precise to the watershed as the those used in the *Water for Life* strategy as they also take into consideration other aspects such as political boundaries (Government of Alberta, 2012e). Land-use issues around municipal and residential area growth (especially in the Edmonton-Calgary corridor), re-zoning/loss of agricultural lands, economic development (especially the oil sands and oil and gas

industry), and tourism and recreation are all drivers for the need for a province-wide land-use framework (Government of Alberta, 2012e).

2.5 Conclusion

The development of the *Water for Life* strategy and the *Land-use Framework* has created a shift in the way both land and water are to be managed in Alberta. These provide an institutional framework upon which water governance is established and structured. On one hand, there has been a greater opportunity for public and stakeholder involvement in the formation and implementation of the watershed management plans and involvement through LWSGs and WPACs. Yet, on the other hand, there is a considerably reduced role—to that of participating in public and stakeholder consultation meetings—in the development of the regional plans (Alberta Environment, 2005; Government of Alberta, 2009b). Another more recent result of this shift has seen the folding of the Environment and Water department into the Sustainable Resource Development department creating the new Ministry of Environment and Sustainable Resource Development.

Water and the *Water for Life* strategy are critical components to the overall *Land-use Framework* because the outcomes of one affect the outcomes of the other. The scale of management is different between the two policy directives and this could have implications in how water is governed. It is also important to know how the stakeholders are organized and what type of partnership each stakeholder has, and what the purpose is for each type of partnership found. This information is used to understand the differences—if any—in capacity between stakeholders, between sector groups found amongst the stakeholders, and across management scales. The next chapter provides the literature review on water governance and capacity and capacity-building.

3. Literature Review

3.1 Introduction

This chapter provides the literature review for the thesis topic. It contains six sections. Section 3.2 provides an overview of the concepts of capacity and capacity-building. It is followed by section 3.3 that reviews the literature on frameworks for capacity and capacity building. Section 3.4 pulls together the elements of capability —discussed as capitals— found in the previous section and provides matrices of the literature for each. Section 3.5 looks at how researchers have measured or determined levels of capacity. The final section summarizes what is known as well as unanswered questions from the literature and provides a table of proposed attributes of capitals for water governance.

3.2 Overview of Capacity, Capability and Capacity-Building

Although capacity and capacity-building are not new concepts, they came into the forefront of several disciplines in the 1990s (Alaerts, Hartvelt, & Warner, 1997; Franks, 1999; Chaskin, 2001; Ivey, Smithers, de Loe, & Kreutzwiser, 2004). Research in economics, health, education, information technologies (IT), community development, and climate change have paid considerable attention to capacity and capacity-building (Chaskin, 2001; Ivey et al., 2004; Moore, Severn, & Millar, 2006; Beckley, Martz, Nadeau, Wall, & Reimer, 2008). The water sector initially focused on capacity-building due to high levels of aid and development projects completed during the 1960s and 1970s that failed to deliver the promised outcomes (Franks, 1999). This came about because water aid and development projects were focused on delivering the physical infrastructure with little thought to how the infrastructure would be managed and operated in the long term (Alaerts et al., 1997; Franks, 1999). Water practitioners were able to pinpoint the need to build human capacity as the reason for project failure and this

concern led to two UNDP symposia on water sector capacity-building, held in Delft in 1991 and 1996. Water practitioners gathered to try to identify what capacity-building meant and what was needed to develop and implement capacity-building approaches and tools for aid and development projects. It was argued that it was not good enough to do a project, such as supply a community with a new pump-operated well, unless there was capacity built into the local population to maintain and repair the equipment and educate on good water practices (Abrams, 1999). It was seen as ideal to involve the community in the development of the policies and practices needed to keep the particular project going (Abrams, 1999). It was argued that accountability and transparency of aid and development groups were required to ensure that capacity was built so the water project would continue to work and benefit the community long after the providing group left (Alaerts et al., 1997).

Researchers also realized that a discussion on capacity-building could not take place without a discussion of capacity and capability (Franks, 1999). As stated in Chapter 1, capacity is a term most often used to describe a basic concept: the capability—actual or potential— of individuals, organizations and institutions, and society as a whole to perform, manage, solve, accomplish, or withstand determined objectives or situations (Franks, 1999; Teohareva, 2011). Capability has elements that exist and/or can be developed in order to have capacity (Franks, 1999; Teohareva, 2011). Capacity-building is, therefore, the development of capability in order to increase capacity to a pre-determined level (Franks, 1999; Moore et al., 2006; Robins, 2008b).

Studies in areas of natural resource management and water and watershed management have shifted. Initially studies focused on short-term projects that build

capacity in a community in order to operate or manage a specific piece physical infrastructure (Arreguin, Marquez, & Gomez, 1996; Alaerts et al., 1997; Franks, 1999; de Loë, Di Giantomasso, & Kreutzwiser, 2002; Ivey et al., 2004; Armitage, 2005; Ivey, de Loë, Kreutzwiser, & Ferreyra, 2006; Pres, 2008; Robins, 2008b, 2008a) Now studies focus on understanding the elements of capability and how they work together to create capacity for the long term management of a system (Arreguin et al., 1996; Alaerts et al., 1997; Franks, 1999; de Loë et al., 2002; Ivey et al., 2004; Armitage, 2005; Ivey et al., 2006; Pres, 2008; Robins, 2008b, 2008a). The focus has shifted from project specific management to holistic management of water done at appropriate scale (Alaerts et al., 1997). For example, rather than having the government at the highest level within the state build specific physical infrastructure to provide water —such as an irrigation canal— project overseers bring together the stakeholders of the community level and facilitate the community to build and manage the irrigation canal themselves (Alaerts et al., 1997; Abrams, 1999). This shift involves a different set of capabilities and capacities than before. It becomes important to know how and which elements of capability come together to give a system the capacity to do its work in order to understand where a system is either performing at its best or what could be changed —or built— in order to improve outcomes and performance.

3.3 Capacity and Capacity-Building in the Literature

While there is a very large literature on capacity and capacity-building spread across several disciplines, there has been no universal theory or standardized method for measurement of capacity (Chaskin, 2001; Beckley et al., 2008). Nor is there even agreement on the mechanisms, actor roles, elements of capability, and tools needed for

capacity (Chaskin, 2001; Beckley et al., 2008). This is, in part, due to the multitude of elements that make up capability which determines capacity and the tendency of research to focus on specific elements or aspects of capacity and capacity-building (Chaskin, 2001; Beckley et al., 2008). The following paragraphs discuss key papers that gave the broad groupings or frameworks for the elements of capability found in capacity and capacity-building.

Within the community and international development discipline, effort has been made to provide definitions of capacity and to understand the process of capacity-building. Chaskin (2001), for instance, argued that community capacity is characterized by a sense of community, commitment, ability to solve problems, and having access to resources. Capacity is achieved first by engagement through three levels of social agency (individual, organizational, and social networks) in order to outline challenges and set strategies. Social agency is then accessed again to operationalize strategies through planning, access of resources, production of goods and services, and information dissemination. Capacity is reached when desired outcomes are met. From Chaskin's perspective, capacity is a fluctuating level of capability where stakeholders, social agency, and a variety of needed resources come together to accomplish a specific goal or task. The combination of stakeholders, social agency, and resources will shift and change as new catalysts arise. While Chaskin's framework provides one understanding of how capacity is tapped in order to accomplish goals or solve problems, he does not identify many of the elements of capability that are needed to have capacity in the first place. His focus is on community and the social agency of capacity and capacity-building.

Still within community and international development discipline, Beckley et al. (2008) refined the conceptual model of capacity by pointing out that capacity is an outcome that is derived from having a set of assets made up of natural, economic, human, and social capital that are faced with a catalyst (opportunity or threat) which in turn is addressed by spheres of social relations (market, bureaucratic, associative, and communal). Here too is the idea that capacity is a fluctuating level of capability where natural, economic, human, and social capitals are the elements of capability. Beckley et al. (2008) also agreed with Chaskin (2001) on four points: 1) capacity-building is triggered by catalysts, 2) communities have resources or capital, 3) social agency is required to access resources or capital, and 4) capacity is met when outcomes are achieved. However, Beckley et al. (2008) provide a broader set of elements that contribute to capability and that each element or capital itself is composed of a set of characteristics. While Beckley et al. (2008) do provide more insight to capability, its attributes (outlined as capitals), and their role in capacity, the article does not provide a complete list of capability elements or capitals.

The resource management literature offers a different perspective on capacity. They see the community (social agency) as the practitioners and stakeholders, who are already in place, and capacity is a set of measurable attributes that allow the community to function to a specific level (Moore et al., 2006; Webb & Curtis, 2006; Robins, 2008b). Webb and Curtis (2006) completed a project for the government of Australia mapping out a framework of capacity, along with indicators for measuring capacity, for natural resource management at a regional scale. They did not see capacity as a fluctuating level of capabilities. Rather they viewed capacity comprising capabilities which are a set of

tangible and intangible 'things', or attributes needed to accomplish a goal or series of goals. They too called these attributes of capability capitals and acknowledge the need for elements from four different capitals —natural, produced economic (the harvested resources), human, and social. However they only provide indicators for produced economic, human, and social capitals as they argue that natural capital is the purpose of natural resource management.

Moore et al. (2006) continued the process of developing a framework of capacity in natural resource management. Again, their framework viewed capacity as a measure of attributes through capitals rather than a process; however they add a new category that captures institutional arrangements and attributes arguing that this is a separate realm from other capitals and from social agency. They also argue that natural capital is a key component in conceptualizing and measuring capacity. The authors present attributes such as extractable resources, ecosystem services, and appreciation of nature as aspects which are not only measurable but also critical to the capacity of natural resource management. This difference of opinion between Webb and Curtis (2006) and Moore et al. (2006) on the importance of including natural capital in frameworks of capacity when examining the management of natural resources is one that needs further research.

Finally, Robbins (2008b) developed a framework for capacity using Moore et al. (2006) as the foundation for her model. She included four capitals —economic, human (divided into cognitive and structural), social, and institutional. She further identified twenty-two tools or approaches commonly used in building capacity. As the discussion on capacity-building cannot take place without an understanding of the elements of capability that make up capacity, her framework was used to help participants keep in

mind the capabilities while they determined the value or need for the tools and approaches to build capacity. Robbins (2008b) considered the twenty-two tools and approaches for capacity-building as measures, and indeed did measure the support for each through a survey using Likert scale ranking. However, it could be argued that these measures are less an analysis of capacity requirements but more a survey of desired tools for capacity-building. While this approach might identify areas where capacity is needed to be built, it does little to identify or measure the actual or perceived capacity or even if the modified framework of capacity was indeed applicable or appropriate to the natural resources community.

Within the water governance literature, one early framework was built by de Loë et al. (2002). This framework incorporates five broad divisions which include technical, financial, social, political and institutional capacities, each of which are composed of many elements of capabilities needed to make up each capacity. This framework was used to analyze the capacity of local governments in Ontario to protect groundwater. de Loë et al. (2002) were clear that all five capitals were important to groundwater management. However, other researchers, including Moore et al. (2006) and Robbins (2008b), have argued that political and technical capacities should be included in institutional capital.

In summary, researchers from many disciplines have contributed to developing a framework for capacity. These contributions can be divided into five divisions of natural, economic, human, social, and institutional capital. The elements found in each capital are discussed in detail in the following section.

3.4 Elements of Capability as Organized into Capitals

The basic definitions of capacity and capability as well as the broad grouping of elements of capability into capitals have, over a period of time, coalesced (Chaskin, 2001; Beckley et al., 2008; Pres, 2008). Whether all of the elements of capability have been identified and whether they are all equally important to a specific situation, discipline or system are not as settled. This is because the required elements for capacity are fluid and depend on the context (social, political, cultural, economic, geographic etc.), the objective to be met, type of organization, project, person, or institution, and the point in time (Beckley et al., 2008; Pres, 2008; Robins, 2008b). The literature reviewed in section 3.3 set forth the broad grouping of elements of capability into capitals and provided some discussion as to the makeup of each capital. This section focuses on the capitals and the elements found within each.

The literature on the elements that make up capacity tends to focus on specific elements or tools found within the capitals, and comprises the vast majority of all papers on capacity and capacity-building. Some research projects are based on extensive structured interviews and questionnaires which develop a list of needed tools, each fitting into a specific capital and required to build capacity within an organization or governance system (Robins & Dovers, 2007; Robins, 2008b). Other projects examine the relationship between different capitals or elements within a capital and the capacity of the governance structure (Ivey et al., 2006; Floress et al., 2011). For example, a paper by Ivey et al. (2006) assesses the institutional arrangements to determine local government capacity to protect source water in Alberta using the elements found within institutional capital. There is also extensive literature on various capitals that focus on public participation and

the grassroots movement in water and watershed management (Leach & Sabatier, 2005; Miller & Buys, 2008; Berry & Mollard, 2010; Floress et al., 2011). These include elements of capabilities such as trust and reciprocity which are included in social capital and representation and public participation which is included in institutional capital. It then becomes a question of determining what elements of capability are found in each of the capitals.

Natural capital is defined as the generation of economic and human capital from natural resources such as mining, forestry, fishing, oil and gas, etc., as well as the benefits provided by ecosystems such as nutrient cycling, pollination, water purification, etc. (Beckley et al., 2008). It also encompasses the actual attributes (air, water, soils, forests, wildlife, etc.) of nature (Beckley et al., 2008). Table 3.1 shows the various attributes of natural capital and the key literature that placed importance on each.

Table 3.1: Natural Capital

Natural Capital				
Elements				
Key Papers	Ecosystem Services (provisioning, regulating, cultural, and supporting)	Extractable Natural Resources	Income/ Jobs from Resource Extraction	Appreciation of / Access to Nature
(Beckley et al., 2008)	X	X	X	
(Bossel, 1999)	X			X
(Chiesura & de Groot, 2003)	X			X
(Olewiler, 2006)	X			X
(NRTEE, 2003)	X			
(Moore et al., 2006)	X	X		X

Webb and Curtis (2006), attempted to include natural capital in their report, *Mapping Regional Capacity*. However, they found that natural capital and its elements did not appear to have any meaning or significance to their respondents. This was because respondents viewed natural capital as the reason for natural resource management, rather than an element that contributed to the building of capacity. Moore et al. (2006) found

that natural capital was not discussed in the terms of 'natural' capital. Instead elements found in natural capital, such as appreciation for nature, ecosystem services, etc., would come up in discussions on other types of capital. In disciplines outside of resource management, natural capital plays a bigger role. In the sustainability planning field, for instance, natural capital is considered to be the basis for evaluating environmental sustainability (Bossel, 1999; NRTEE, 2003; Olewiler, 2006) and the socio-cultural aspects of natural capital are viewed as integral to successful sustainability (Bossel, 1999; Chiesura & de Groot, 2003).

Economic capital is defined as the fixed (built infrastructure) and liquid (financial) assets of an individual, organization, business, institution or community as well as produced goods and services that are combined to assist completion of goals and objectives (de Loë et al., 2002; Moore et al., 2006; Webb & Curtis, 2006; Beckley et al., 2008; Robins, 2008b). Table 3.2 shows the various attributes of economic capital and the key literature that placed importance on each. There was little disagreement on the importance of economic capital although there was a variety to the elements that are seen as part of it.

Table 3.2: Economic Capital

Economic Capital								
Elements								
	Physical	Financial						Produced
Key Papers	Public Infrastructure (Utilities, Dams, etc.)	Government Budgets and Cash Flows	Diversity to Community Cash Streams	Access to Markets	Resilience to Market Fluctuation	Grassroot Access to Grants	Transparency & Accounting	Harvested Resources (water, fish, etc.)
(Beckley et al., 2008)	X	X	X	X	X			
(Webb & Curtis, 2006)	X	X	X					
(Moore et al., 2006)	X	X	X			X		X
(Robins, 2008b)	X	X	X			X		
(de Loë et al., 2002)		X					X	

All key papers see government budgets and cash flows as important to the financial portion of economic capital, and four of the five saw two other elements —diversity to community cash streams and public infrastructure— as important elements. Moore et al. (2006) and Robins (2008b) added that grassroot access to grants is critical, especially in light of the re-scaling of day to day operations from higher levels of government to lower levels and even to non-government organizations. Moore et al. (2006) included produced economic capacity —in the case of water, and example of this would be the cost incurred and charged to citizens of a community for their drinking water— as a key element to economic capital. Transparency and accountability were included in this area by de Loë et al. (2002) as being important for ensuring financial accountability rather than having it included in institutional capacity as it was argued that there are other mechanisms to develop and keep accountability and transparency in institutions.

Human capital can be defined as the personal resources and skills used by an individual and accessed by organizations, institutions, businesses, and society at large and requires attributes of knowledge, skills, and experience (Chaskin, 2001; NRTEE, 2003; Moore et al., 2006; Beckley et al., 2008). Table 3.3 below shows the various attributes of human capital and the key literature that placed importance on each.

All key papers see education as a critical element of capability to human capital. The elements of job experience; life experience and acquired skills; and indigenous and local knowledge are seen as critical in four of the six papers (NRTEE, 2003; Moore et al., 2006; Beckley et al., 2008; Robins, 2008b). Webb and Curtis (2006) as well as Beckley et al. (2008) argued that individual health is important because health provides social context and an overview of the community in order to understand its relationship with its

environment. In other words, healthy individuals are able to make better decisions and have more resilience (Webb, Cody, Harrison, Sincock, & Mues, 2004). Three key papers discussed leadership or the ability to produce champions (Beckley et al., 2008; Davies, 2009; Taylor, 2010). These researchers argued that champions are important as they promote the importance of the work undertaken to all levels of society, build bridges between groups, and help facilitate important conversations that drive the impetus for change. Entrepreneurship, willingness to participate, and diversity are three elements mentioned in key papers once (Chaskin, 2001; Webb & Curtis, 2006; Beckley et al., 2008).

Table 3.3: Human Capital

Human Capital									
Elements									
Key Papers	Education	Job Experience	Life Experience & Acquired Skills	Individual Health	Entrepreneurship	Leadership	Indigenous & Local Knowledge	Willingness to Participate	Diversity
(Chaskin, 2001)	X							X	
(Beckley et al., 2008)	X	X	X	X	X	X	X		
(Webb & Curtis, 2006)	X			X					X
(NRTEE, 2003)	X	X	X				X		
(Moore et al., 2006)	X	X	X				X		
(Robins, 2008b)	X	X	X				X		
(Davies, 2009)						X			
(Taylor, 2010)						X			

Social capital can be defined as the relationship an individual, organization or institution has with others and capacity can be measured and developed through tools and attributes such as networks, trust and reciprocity, commitment, motivation, a set of shared or agreed upon values, attitudes and behaviours, and sense of place (Chaskin, 2001; Moore et al., 2006; Beckley et al., 2008; Robins, 2008b). Table 3.4 shows the various attributes of social capital and the key literature that placed importance on each.

Table 3.4: Social Capital

Social Capital									
Elements									
Key Papers	Trust & Reciprocity	Values, Attitudes, & Behaviour	Commitment	Norms & Sanctions (Common Rules)	Networks & Information Flows	Collective Action & Participation	Collective Association & Representation	Motivation	Sense of Place
(Chaskin, 2001)					X		X		
(Beckley et al., 2008)				X	X	X			
(Adger, 2003)	X	X		X	X	X			
(Webb & Curtis, 2006)						X			
(Moore et al., 2006)	X	X	X		X		X		X
(Robins, 2008b)	X	X	X		X		X	X	X
(Pretty & Ward, 2001)	X			X			X		
(Leach & Sabatier, 2005)	X	X			X	X			
(Pretty, 2003)	X			X	X	X			
(Floress et al., 2011)					X	X	X		
(de Loë et al., 2002)			X		X	X	X		

Networking and information flows are seen as a critical element in nine out of eleven key papers (Chaskin, 2001; de Loë et al., 2002; Adger, 2003; Pretty, 2003; Leach & Sabatier, 2005; Moore et al., 2006; Beckley et al., 2008; Robins, 2008b; Floress et al., 2011). This is followed by collective action and participation as being critical to social capital, with seven key papers (de Loë et al., 2002; Adger, 2003; Pretty, 2003; Leach & Sabatier, 2005; Webb & Curtis, 2006; Beckley et al., 2008; Floress et al., 2011). Both trust and reciprocity as well as collective association and representation are mentioned in six key papers while values, attitudes and beliefs and norms and sanctions were seen as critical to social capital in four key papers each. Elements of commitment, sense of place and motivation are mentioned in three key papers or less yet each have a compelling argument for inclusion. For example, de Loë et al. (2002) argued that municipal government needs commitment from the community itself that there will be support for groundwater protection activities as outlined by the municipality. Whereas Moore et al. (2006) argued that commitment is more about agreement between all stakeholders to support each other in the decisions made and actions taken rather than just agreement by

the governed community to implement the decisions made by a legislating body. Both Moore et al. (2006) and Robins (2008b) argued that sense of place was important as those expected to undertake any changes to their practices due to changing legislation and policy would fare better if the individuals were grounded in a sense of place. Meaning those that see the uniqueness of their location and have feelings towards the landscape they reside in are more likely to engage in activities that promote and protect it than not (Moore et al., 2006).

Institutional capital is defined as the governance, legal structures, and social norms that provide the context or 'rules' within which individuals, organizations, institutions, and society function (Moore et al., 2006; Robins, 2008b). Table 3.5 shows the various attributes of institutional capital and the key literature that placed importance on each.

Table 3.5: Institutional Capital

Institutional Capital									
Elements									
Key Papers	Human Resource Dev.	Inter-Organizational Relationships	Communication and Information Sharing (Internal & External)	Rules & Incentives (legal, regulatory, policy)	Technical (monitoring & control systems, infrastructure)	Institutional Culture	Representation & Public Involvement	Political Influence	Management Practices & Procedures
(Chaskin, 2001)		X					X	X	
(Brown, 2008)	X	X	X	X		X			X
(Cosío, 1998)				X	X				
(de Loë et al., 2002)		X	X	X	X				X
(Ivey et al., 2006)				X	X		X		
(Moore et al., 2006)				X					
(Robins, 2008b)				X					
(Van de Meene, Brown, & Farrelly, 2009)	X		X	X	X		X		X

Beckley et al. (2008) argued against the idea that institutional capital is separate from social capital, contending that institutions run on similar principals as society and require the same elements of capability such as networking and relationships. However, others

have argued for the creation of a separate capital for institutional processes. All but one key paper argued that the main element found in institutional capital are rules and incentives (Cosío, 1998; de Loë et al., 2002; Ivey et al., 2006; Moore et al., 2006; Brown, 2008; Robins, 2008b; Van de Meene et al., 2009). These are the legal, regulatory, and policy tools that provide the rules and incentives for the institution to do the required work and it is applicable at any scale - from organization to overarching governance systems (Cosío, 1998; de Loë et al., 2002; Ivey et al., 2006; Moore et al., 2006; Brown, 2008; Robins, 2008b; Van de Meene et al., 2009). Other elements found in institutional capital are not as universally agreed upon. These elements range from technical tools to management practices to organizational relationships.

While the capitals are structured through elements of capabilities, capacity itself is considered to be a functional cross-representation of one or more of the capitals and one or more element in each capital (Morgan, 2006). According to Morgan (2006), capacity is the capability to act, to generate development results, to relate, to adapt, and to achieve coherence. The capability to act blends attributes of motivation, commitment, values, attitudes and beliefs from social capital, liquid assets from economic capital, leadership from human capital, and human resources development from institutional capital, as well as space, confidence, security (operational autonomy), and identity, in order to achieve the mandates, goals, and objectives. The capability to generate development results is both the improved capacity that happens when the capitals are accessed, as well as when outcomes achieved are to desired levels of performance. The relationships and linkages between organizations, institutions, and other actors who are either working towards similar goals or are needed to provide legitimacy to the purpose, goals, and outcomes is

the capability to relate. The capability to adapt is where organizations are able to meet threats and challenges, as well as new ideas and opportunities, as they arise. The capability to achieve coherence is the structures ability to hold together the focus or purpose yet maintain complexity and diversity that comes with complex actors, capacities, and mandates. It should be pointed out that accessing the structure of capacity, as well as the function of capacity, happens both internally —to develop or advance a specific institution or organization's skill(s) or capital(s)— and externally —to develop or advance a linked governance structure (Morgan, 2006; Robins, 2008b).

3.5 Assessing Capacity

The literature on assessing capacity suggests two approaches. One is found through applied research and includes tools and checklists for water resource management practitioners to assess capacity quantitatively (MEA, 2005; Webb & Curtis, 2006; UNDP, 2011). These tools to measure capacity tend to focus on the national scale with either suggestions on how to scale down or with sections that are focused on a smaller scale (MEA, 2005; UNDP, 2011). This type of applied research could be better termed 'manuals' or 'practitioner guides' as they provide information on what needs to be measured as well as checklists of statements regarding capacity (MEA, 2005; UNDP, 2011). Within the manuals, capacity is assessed through indicators, which are measured on demonstrated or stated high, medium, or low ability which then points towards areas where capacity building is needed (MEA, 2005; UNDP, 2011).

Other research suggests an approach that relies less on quantitative measurement and more on qualitative assessment. The literature provides more detailed information on analyzing capacity assessment results and on the implications of the capacity assessment

but provides few examples of questions used in the assessment process (de Loë et al., 2002; de Loë & Lukovich, 2004; Ivey et al., 2004; Ivey et al., 2006; Engle & Lemos, 2010). Often these papers develop indicators based on the literature and then assess using in-depth and/or structured interviews, analysis of documents (financial reports, minutes, etc.), compilation of policies, procedures, and practices, and so forth. For example, de Loë et al. (2002) analyzed the capacity of local governments in Ontario to protect groundwater. They developed indicators from the literature for five sub-categories of institutional capital —financial, technical, social, institutional, and political. The capacity was then analyzed through in-depth interviews and analysis of municipal documents, consultant reports, and other documents. Some indicators were devised as checklists. For example, a list of specific policies and processes was developed, and then documentation was checked to see if the municipality had those as part of their governance. Some, like the ones for financial capacity, were based on absolute numbers and source of income.

While quantitative assessments are not as common, they too use the literature to develop indicators for each type of capital. For example, in one study on community capacity for watershed conservation, researchers developed a list of social indicators of capacity based on the literature and then measured capacity using a seven point Likert-type scale (Brinkman, Seekamp, Davenport, & Brehm, 2012). Principle components analysis was conducted to reduce the number of indicators to reflect key factors of capacity. These factors were collective action, community empowerment, and shared vision. Each indicator used in the survey was then entered into a calculation based on its loading score to create a composite measure of community capacity. Forward step-wise regression was then performed to see how much variability was accounted for by which

factor in explaining community capacity. The authors found that collective action and community empowerment predicted the most variability in the global measure of capacity.

In addition to the work reviewed to this point, extensive work on sustainability and performance indicators were also examined (Gustavson, Lonergan, & Ruitenbeek, 1999; Simonovic, 2001; Lockie, Lawrence, Dale, & Taylor, 2002; NRTEE, 2003; Hooper, 2006; Ioris, Hunter, & Walker, 2008). Sustainability and performance indicators do not, however, assess capacity; rather they are used to measure management results or management plan outcomes (Gustavson et al., 1999; Simonovic, 2001; Lockie et al., 2002; NRTEE, 2003; Hooper, 2006; Ioris et al., 2008). As the success of reaching outcomes from a water management plan are grounded in the capacity of the governance system, it is possible to build capacity measures from existing sustainability and performance indicators (NRTEE, 2003; MEA, 2005; UNDP, 2010, 2011).

3.6 Conclusion

There are three core concepts that emerge from the literature on water governance and capacity. The first is that capacity is fluid and building capacity is an on-going process (Arreguin et al., 1996; Alaerts et al., 1997; Alaerts, Hartvelt, & Patorni, 1999; Franks, 1999). The second is that capacity can be determined by its capitals (de Loë et al., 2002; Ivey, De Loë, & Kreutzwiser, 2002; de Loë & Lukovich, 2004; Leach & Sabatier, 2005; Ivey et al., 2006; Pres, 2008; Brinkman et al., 2012). The third is that each of the capitals are made up of a variety of elements of capabilities (Chaskin, 2001; de Loë et al., 2002; Moore et al., 2006; Webb & Curtis, 2006; Beckley et al., 2008; Robins, 2008b). What is missing from the literature is which elements of capability should be included in each

capital and whether each of those elements and capitals have relevance to water governance.

By combining various capitals and their elements of capabilities, as presented in the matrices above, a proposed framework of capacity can be brought together (see Table 3.6 below). Although there has been disagreement on the importance of natural capital, it has been included to test whether it is important to the stakeholders in the study region. The results would not settle the argument for its inclusion or exclusion in capacity research on water or natural resource governance. Rather it would indicate the importance only for this particular region. Each of the other capitals have all of the elements discussed in the key papers included. This allows for established elements such as rules and incentives found in institutional capital as well as for new elements such as diversity found in human capital to be examined in a closer manner. This framework can then be analyzed using the results of a research design developed to capture the perspectives of stakeholders in water governance. By investigating what is most important to the practitioners themselves, it will be possible to determine which elements of capabilities are relevant to water governance.

Table 3.6: Proposed Elements of Capabilities in the Capitals

Natural Capital	Economic Capital	Human Capital	Social Capital	Institutional Capital
Ecosystem Services (provisioning, regulating, cultural, and supporting)	Public Infrastructure	Education	Trust & Reciprocity	Human Resources Development
Extractable Natural Resources	Government Budget & Cash Flows	Job Experience	Values, Attitudes, & Behaviours	Inter-Organizational Relationships
Income/ Jobs from Resource Extraction	Diversity to Community Cash Streams	Life Experience & Acquired Skills	Commitment	Communication & Information Sharing
Appreciation of / Access to Nature	Access to Markets	Individual Health	Norms & Sanctions	Rules & Incentives
	Resilience to Market Fluctuation	Entrepreneurship	Networks & Information Flows	Technical
	Grassroots Access to Grants	Leadership	Collective Action & Participation	Institutional Culture
	Transparency & Accounting	Indigenous & Local Knowledge	Collective Representation & Association	Representation & Public Involvement
	Harvested Resources	Willingness to Participate	Motivation	Political Influence
		Diversity	Sense of Place	Management Practices and Procedures

4. Methodology

4.1 Introduction

This chapter describes the methods used to assess the current capacity and capacity-building needs for water governance in Alberta as perceived by participants directly involved in the water governance structure. It starts with a section outlining the research questions and provides a rationale for using exploratory descriptive research method.

This is followed by section 4.3 which gives the personal situatedness. Section 4.4 outlines the study area and section 4.5 discusses the sampling —what was intended, who was actually selected, why and what issues arose during the interviewing. This section is followed by sections on how the data will be collected, managed, and analyzed. Sections on rigour and ethics follow the section on the data.

4.2 Research Question and Choice of Method

The purpose of this thesis is to answer a series of questions that would provide an understanding of the capacity and capacity-building needs in Alberta's water governance structure from the perspective of the stakeholders. This understanding requires four thematic questions to have been asked: 1) What capacity do stakeholders have? 2) Where is there a lack of capacity in water governance? 3) What tools or resources are needed to build capacity? and 4) Where should capacity be built? As it is to be understood from the perspective of the stakeholders themselves, and as there has been little work done on the capacity of Alberta's water governance structure, the purpose lends well to qualitative methods.

The thematic questions, along with the limited knowledge on Alberta water governance capacity, help narrow the choice of the research design to exploratory-

descriptive-interpretive. While some might argue that all qualitative research is exploratory-descriptive (Hays, 2010; Marshall & Rossman, 2011); others argue that there are multiple types of qualitative research and exploratory-descriptive is just one of those (Sandelowski, 2000; DeLyser, Herbert, Aitken, Crang, & McDowell, 2010). The exploratory component is the uncovering of themes, patterns or categories of subjects and the finding of their links (if any) (Marshall & Rossman, 2011). Sandelowski (2000) argued that description provides the facts of the phenomenon in a manner that "...is not highly interpretive in the sense that a researcher deliberately chooses to describe an event in terms of a conceptual, philosophical, or other highly abstract framework or system" (p. 336). Rather, the description is "...the presentation of the facts of the case in everyday language" (Sandelowski, 2000, p. 336). From a geographical perspective, the two provide a "cross between ontological constructivism [exploratory] and epistemological realism [descriptive]" (Crang, 2001, p. 221).

4.3 Personal Situatedness

A researcher's personal situatedness can influence the research design and outcomes (Crang, 2003; Liamputtong, 2009; Marshall & Rossman, 2011). Personal situatedness is the interconnection between the context of the research (location; people involved; subject matter; and attributes of social, economic, political, historical, environmental, etc.) and the researcher's role, identity, experiences, etc. ("Situatedness," 2008). As a researcher, one is aware of the negotiation between the researcher and the participant, however there is also negotiation between the researcher and the design and interpretation (Hays, 2010). One's knowledge, background, likes and dislikes, preferences, and personal realities can create bias (Crang, 2003; Liamputtong, 2009; Marshall & Rossman, 2011). It

is important to include a statement or short personal biography that highlights aspects from one's life that could influence the research in the thesis or article (Marshall & Rossman, 2011). Reflexivity is one way of uncovering bias during the research process (Liamputtong, 2009). This can be accomplished by recording one's thoughts, feelings, attitudes, etc. pre- and post interview or observation, as well as through creating a self-reflection journal or field-note series (Marshall & Rossman, 2011).

For this project, I was aware of the knowledge built from my past work on the efficacy of local watershed stewardship groups and how it has shaped my own perspective. For example, I developed a strong respect for the way local watershed stewardship groups managed to accomplish so much with the resources they have, and this might have caused me to not see the depth of accomplishment of other groups involved in water governance. I also needed to be mindful of power imbalances between myself and various participants during interviews. As the participants were from organizations' boards and/or key players in water governance, I could have found it difficult to encourage a deeper reflection beyond the accepted 'script' and deflect the potential "give the interviewer what I want her to know/what she wants to hear" situation during the interview. These pitfalls were overcome in two ways. The first was ensuring that the questions were non-threatening and ensuring that probing questions were designed to capture any avoided topics. The second was to build a better understanding of other sectors through asking about their mandates and asking about successful projects. These two approaches also helped collect the required data. Field notes were kept for the first half of the interviews. It quickly became apparent that participants did not hold back and were enthusiastic about participating and sharing information. Indeed, a common concern

stated by many participants was whether they had given enough information to meet my research needs. The notes did not play a role in the analysis, except for noting the impact that the 2014 floods had on conversations after the event.

4.4 Study Area

The assessment was conducted across three of the seven river basins in Alberta, the South Saskatchewan River Basin, the North Saskatchewan River Basin, and the Athabasca River Basin (see Figure 4.1 below). These three basins were chosen due to their current water planning and regional planning processes. The South Saskatchewan River Basin was the first to develop and have approved a watershed management plan under the Water Act (Government of Alberta, 2006). It also had been working on a draft of the regional plan (Government of Alberta, 2009b). The North Saskatchewan River Basin was working on its watershed management plan and had its sub-regional plan for Edmonton and area under way. The Athabasca River Basin had one of the newest watershed planning and advisory councils and had started the first phase of its watershed management plan. The first approved regional plan under the *Land-use Framework* covers a portion of this basin. Each of these basins had stakeholders who were active in the water management planning process and were aware of the land-use framework and impending or existing regional and sub-regional plans. That the stakeholders were active, informed, and involved ensured that information provided during the interviews about capacity and capacity-building needs was current.

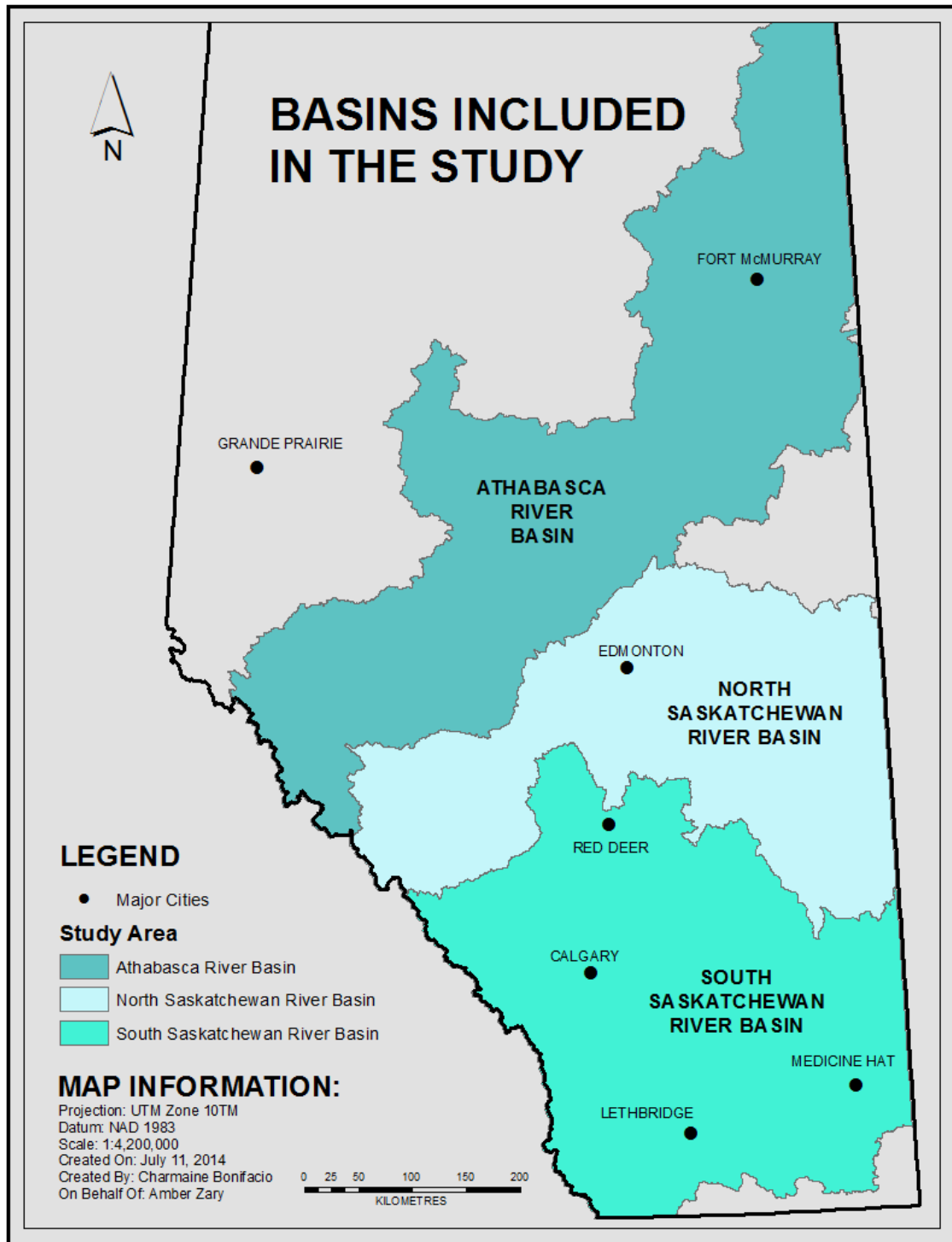


Figure 4.1: Study Area

Source: Based on GeoGratis atlas of Canada 1, 000, 000 national frameworks data, hydrology-drainage areas for Alberta.

4.5 Participant Selection

There are a large number of stakeholders involved in water management and governance in Alberta as described in Chapter 2. These stakeholders are categorized into several groups or sectors. These sectors are: 1) provincial government, 2) government mandated partners (the Alberta Water Council, the watershed planning and advisory councils, and transboundary groups), 3) local government (covering First Nation band councils, counties and municipalities), 4) non-profit partners (local watershed stewardship groups and NGOs), 5) for-profit users (industry and irrigation districts who represent farmers), and 6) water researchers and experts (not necessarily tied to any particular basin).

Selecting a suitable sample is imperative to the quality of the research (Coyne, 1997, p. 623). As the research design was exploratory-descriptive-interpretive, it was important to try to capture a broad perception of capacity and capacity-building needs. Purposeful sampling was a way to ensure the most information-rich sources are used (Coyne, 1997; Liamputtong, 2009, p. 11) and this was strengthened by the use of maximum variation sampling. Maximum variation sampling is where the researcher selects the participants to ensure diverse variations, enabling the researcher to identify common patterns across groups that may or may not be pre-identified (Marshall & Rossman, 2011). This sampling method was chosen so that the participants would be from different sectors in each region. Snowball sampling is a technique used to gain access to informants when the researcher's network is limited (Liamputtong, 2009, p. 235). This allowed for the inclusion of those experts that the participants themselves saw as important in the water governance structure. Purposeful maximum variation sampling along with snowball

sampling was used to ensure both representation from each group of stakeholders and that the data collected had potential for a depth and richness to the material.

Participants were to be selected (see Appendix A) who were able to read and speak English, and were to be recruited from each level of government (federal, provincial, large municipal, small municipal, county, and First Nations), the Alberta Water Council, watershed planning and advisory councils, industry, irrigation districts, and local watershed stewardship groups. A minimum of 36 participants were needed to ensure there was one person representing each provincial and federal department that has a strong agenda in water, a transboundary group, and the Alberta Water Council. WPACs, large municipalities, small municipalities, counties, First Nation band councils, and watershed stewardship groups in each basin also needed to be approached for representation. Six experts (from think-tanks, for profit companies which are not specific to a particular industry, and from academic institutions), three individuals working in province-wide NGOs, and a representative from each type of industry that uses water extensively were also approached. The participants were to be from the boards of the organizations or be key players directly involved in day-to-day management or governance of water.

If data saturation was not achieved then further participants were to be recruited by adding one participant from each sector until data saturation was reached. Data saturation is the point where little to no new data is acquired ("Data saturation," 2008). Participants were directly contacted by email, using publicly available contact information, to request participation in the project. This email provided a brief rationale for the contact (see Appendix B) and included the invitation to participate letter and consent form as an

attachment (see Appendix C). When the intended participant indicated they were interested, an interview time was set up at a time and public location convenient to the participant. At the beginning of the interview, the participants were asked if they had read the invitation to participate letter and consent form and if they agreed to be interviewed. If they agreed, two copies of the document were signed—one for the participant and one for the researcher.

The first interview took place on May 26, 2013 and the final interview was on December 13, 2013. A total of twenty-six interviews were conducted (see Table 4.1 below) with interviews ranging from thirty-six minutes to two hours in length. Of those not interviewed, two federal government departments chose not to respond to the requests and one federal department chose not to participate as they felt they didn't have much influence on Alberta water governance decisions. This was also the reason given for not participating by one Alberta government department. Although several attempts were made to contact multiple communities, an interview with a town participant in the South Saskatchewan River Basin did not happen.

Some communities contacted did not participate due to staff turnover or they explicitly declined participation, or they did not respond to the request. Communication with those who explicitly declined participation indicated there may be some research/interview fatigue due to the research interest towards the basin. Those contacted in all industry except agriculture and those contacted who were able to represent First Nations either did not reply or explicitly declined participation. These two groups may have made these decisions due to lack of trust in the process, timing, or flood events. Flood events caused

the cancellation of one interview with a local watershed stewardship group and timing prevented the interview of a non-government organization.

Table 4.1: Interview IDs, Dates and Pseudonyms by Sector

Type	ID	Dept/Organization/Group	Pseudonym	Interview Date
Provincial Gov't	29	Alberta Agriculture	Nolan A.	August 29, 2013
	10	Alberta Environment	Andrew C.	August 28, 2013
Gov't Mandated Partners	13	Alberta Water Council	Colin R.	June 19, 2013
	09	Trans-Boundary Group	Telan S.	June 6, 2013
	04	WPAC 1	Max L.	October 3, 2013
	18	WPAC 2	Randy D.	July 23, 2013
	28	WPAC 3	Grace C.	July 24, 2013
NGO (province-wide) & LSWGs	19	Group 1	Richard K.	September 23, 2013
	33	Group 2	James A.	July 16, 2013
	12	SSRB Group	Isabelle S.	October 28, 2013
	35	NSRB Group	Dylan G.	August 29, 2013
Local Government	02	SSRB Large Muni	Lance P.	May 28, 2013
	06	SSRB County	Rick D.	September 11, 2013
	30	NSRB Large Muni	Anthony H.	July 18, 2013
	16	NSRB Small Muni	Lauren C.	July 17, 2013
	15	NSRB County	Dale H. & Scott R.	July 15, 2013
	17	ARB Large Muni	Bryan N.	August 19, 2013
	27	ARB Small Muni	Nathan M.	September 19, 2013
	34	ARB County	Lloyd S.	December 2, 2013
Industry	01	Agriculture	Jerry R.	May 23, 2013
Experts	20	Academic 1	Kent J.	October 15, 2013
	23	Academic 2	Emily Y.	December 13, 2013
	05	General Expert 1	Grant K.	May 29, 2013
	21	General Expert 2	Andrew R.	August 15, 2013
	22	General Expert 3	Patrick W.	August 14, 2013
	40	Politician	Quinn S.	November 19, 2013

During the interview period each basin had a flood event or series of flood events, including a catastrophic 100-year event in the South Saskatchewan River Basin. This did have an impact on the interviews in two ways. First, it did cause scheduling and rescheduling difficulties. Several of the participants were directly involved in the flood events and their aftermaths. Those that had been scheduled to be interviewed in those time periods kindly took the time to phone and try to reschedule. One organization had to cancel completely as they were unable to foresee a convenient time. Secondly, the floods often became an example used to illustrate points during the interviews. These experiences may have impacted the data collected due to the freshness of the events and the intensity of work and emotion created by the events.

4.6 Data Collection, Management, and Analysis

The decision on what data to collect, how to collect it, how to manage it, and how to analyze it is based on the choice of research design. In this thesis the research design is exploratory-descriptive. This allows one to choose from an extensive list of primary and secondary data collection methods and analysis tools. Primary data collection choices include techniques such as direct observation, overt observation (where the researcher participates in the process without stating intent), interviews, questionnaires, analysis of specific types of documents (e.g. government documents, meeting minutes, etc.) etc. Secondary data collection choices include any type of data or data set that has been collected by others for a specific use but retains the ability to be reanalyzed or re-contextualized such as census data, survey or interview data from another project, etc. Being mindful of the time constraint, as well as the need for establishing credibility

through triangulation, two types of primary data were collected—in-depth interviews and government documents pertinent to water governance.

In-depth Interviews and Data Saturation. As shown in Liamputtong (2009), as well as in Marshall and Rossman (2011), in-depth interviews are a common method of data collection used by qualitative researchers. Interviews can be conversational and informal or structured with specific, unchanging questions or guided (Marshall & Rossman, 2011). The guided interview is where the researcher has created a guide that lists topics or open-ended questions with probes and prompts to assist the flow of information. This is the type of interview chosen for the thesis as a way to build knowledge on the following research questions: 1) What capacity do stakeholders have? 2) Where is there a lack of capacity in water governance? 3) What tools or resources are needed to build capacity? and 4) Where should capacity be built? The interview guide, with open-ended questions, probes, and prompts, is located in Appendix D. As the nature of the study required participants of a specific type and as the information given (rather than detail about the participants) was the main focus, demography sheets were not used. Instead, at the beginning of each interview (after consents had been obtained) four questions were observed or asked—the watershed in which the person worked in, the type of organization the person was with, the person's gender, and the years of service in water governance.

Although the number of interviews did not meet the scheduled number, data saturation was achieved (see Appendix E). By the third interview, 45.2% of the themes had been generated and by the thirteenth interview, 91.2% of the themes had been generated. As the sample size only required thirteen interviews to generate 91.2% of the data, the

additional interviews provide what is known as thick or rich description. Thick description is where information collected provides deeper picture of the context and provides the start of the socially constructed interpretation of data which adds to the rigour of the design ("Thick description," 2008). In other words, the sample size was adequate for the research question (Liamputtong, 2009).

Documents. Collecting data from documents is considered to be an unobtrusive method because it does not directly involve interaction with individuals or groups (Liamputtong, 2009). Unobtrusive methods can provide rich information that augments the data collected with other methods (Liamputtong, 2009). Documents that would be pertinent to water governance include: government policy and strategy documents, legislation and regulation documents, organizations' meeting minutes, management documents such as mandates and procedures, advertisements for volunteer and paid positions, public awareness/educational and program brochures, etc. As collecting documents could lead to overwhelming amounts of data, focus was directed to government policy and strategy documents in order to compare the desired capacity with the stakeholders' perceived capacity.

Data Management. NVivo is a computer program used to manage data and provide visualizations, reports, word counts, and conduct cluster analysis. NVivo does not do the analysis for the researchers, rather it assists by providing the structure and space to collect and organize the data, notes, and observations. This program was used to collect all of the data in one central place. All but two interviews were tape-recorded (with participants' permission) and then transcribed. A copy was sent to the participant for member-checking. Once verification was given, the transcript was uploaded to NVivo.

Copies of publicly available documents were downloaded from the internet and uploaded into NVivo as well. Coding of the transcripts, as well as content analysis of the documents, was completed through NVivo. The program is capable of providing reports on the process and progress. This function was used and created a type of audit trail which helped establish credibility.

Data Analysis. As this was an exploratory-descriptive-interpretive design, the data analysis needed to be suited to finding and uncovering themes, patterns and linkages, as well as descriptions of the structure in everyday language. Thematic analysis follows a set of discrete steps for pattern identification and it can be applied to both the in-depth interviews and the collected documents (Liamputtong, 2009). The researcher first reads through the transcript or document several times to familiarize themselves with the data. Next, the researcher creates initial codes —capturing data that provides information on the who, what, where, how, when, how much, why, etc.— that breaks down the document or transcript to discover all possible meaning. Then the researcher starts to uncover connections at the conceptual level, creating axial codes. This is where the initial coding is grouped based on the patterns, linkages, and themes found in the data. While one is coding one transcript or document, she is checking against the rest of the data set as thematic analysis is about the patterns and themes across the data (Liamputtong, 2009). As the researcher codes, the researcher revises, builds, and refines the themes creating definitions and labels for each.

As interviews were transcribed, stories and portions of conversations that stood out due to the intensity or concern shown by the participant were highlighted. Once each interview was transcribed, it was read and re-read for full familiarity with the data. The

transcript was then coded without creating a theme (or descriptor). In other words, whole sentences and ideas were used as the code. Next, a reading of each code took place to see if there was a basic descriptor or theme in words. These were created as sub-nodes and the coded data matching the particular descriptor was assigned. As new transcripts were completed, sentences and ideas were coded on their own if no immediate theme was apparent or directly coded to a sub-node if it was apparent. Finally, a review of each theme was done to see if there was yet a larger theme which was coded to nodes. These were again reviewed to find themes. Transcripts and codes were re-reviewed as new transcripts revealed new concepts.

In total, nine themes, thirty-three nodes, and one hundred and forty-four sub-nodes were created under two overarching themes of capacity and capacity-building. The overarching theme of capacity had five sub-themes of economic, social, natural, human, and institutional. The four sub-themes for building capacity are economic, social, and institutional (see Table 4.2 and Table 4.3 below). Each table shows the theme, the sub-theme, the number of participants who discussed the theme, and the number of times the sub-theme was referred to in discussion across all transcripts.

4.7 Rigour

Rigour are the steps and strategies taken to ensure the quality and integrity of the data (Liamputtong, 2009; Marshall & Rossman, 2011). Rigour in qualitative research is not meant to be equal to the concepts of validity and reliability used in quantitative research, because qualitative research cannot be replicated as it is unique to the day, person, context, etc. (Liamputtong, 2009; Marshall & Rossman, 2011).

Table 4.2: Generated Themes for Capacity

Generated Themes for Capacity			
Theme	Nodes	# of Participants	# of References
Natural			
	Connection to Nature	5	7
Economic			
	Funding	21	53
	Infrastructure	6	14
	Economic Growth	3	4
Human			
	Board, Staff, & Volunteer Development	19	58
	Leadership	4	6
	Internal Skill Transfer	4	4
	Motivation	3	3
Social			
	Knowledge Building & Dissemination	23	70
	Collaboration	16	51
	Networking	14	26
	Individual Perception, Values, Meanings	9	22
	Motivation	3	3
	Trust	3	3
Institutional			
	Governance Development	20	182
	Technology and Communication Tools	17	72
	Organizational Development	12	32
	Volunteer Management	9	19

Table 4.3: Generated Themes for Capacity-Building

Generated Themes for Capacity-Building			
Theme	Nodes	# of Participants	# of References
Economic			
	Long Term Funding	5	8
	Life Cycling	1	1
Human			
	Training & Skill Development	3	4
	Communication Development	3	3
	Technical Staff/Experts	3	3
	Board Development	2	2
	Champions	2	2
Social			
	Social Development	6	9
	Collaboration & Commitment	5	11
	Trust	4	6
Institutional			
	Government Development	9	14
	Management Practices	8	10
	Technology & Tools	6	10
	Capacity Building, Other Areas	1	1

Rigour is the means to establish the credibility and authenticity, the transferability or applicability, the dependability, and the confirmability of the data (Liamputtong, 2009). A well-designed qualitative research design will incorporate several methods to ensure rigor. Some methods will be more suited to some research designs. For example, the prolonged engagement and field work, which helps reduce bias (and increase dependability and credibility) would be useful for establishing rigour in ethnographic research, but less useful in exploratory-descriptive-interpretive research (Liamputtong, 2009).

This research design used several suitable methods to establish rigour. Credibility is established through the use of verbatim quotes to provide evidence. This can be seen in the results and discussion found in chapter 5. Triangulation (through the use of multiple types of data collected) can be seen also in chapter 5 when the results are discussed and compared to the information found in the government documents. Thick description by having more interviews than the minimum required to achieve data saturation. Member checking (where the participant verifies the transcript) happened once the tape recorded interview was transcribed. The participants were sent a copy of their interview to review. Rigour was also established through peer review (where the researcher conferred with the thesis supervisors, committee members, and other knowledgeable people in the field).

4.8 Ethics

Ethics are a consideration in any research and are even more imperative when there are human subjects involved. The letters of invitation to participate provided participants with information such as their right to withdraw from the research, the benefits and potential harm of the research, how information will be stored and how their anonymity

will be protected. These rights were reiterated prior to the in-depth interview starting. The University of Lethbridge has comprehensive policy and procedure on ethics that follows the standards outlined by the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (Interagency Advisory Panel on Research Ethics, 2010), and all research that involves people must apply for approval prior to commencement of interviews or surveys. This project followed the University of Lethbridge's policy and procedure for human subject research.

4.9 Conclusion

This chapter has described the planned methodology for the thesis and described where revisions to the planned methodology were required. With any plan, there can be deviation and this project was no different. In this particular case, the number of desired interviewees was not achieved. The following chapter presents the findings and the discussion of the findings. It includes both the findings from the interviews as well as the findings from the documents and how each may differ.

5. Findings and Discussions

5.1 Introduction

This chapter presents the results from the thematic analysis of the in-depth interviews and government water governance documents. Section 5.2 provides some initial notes on capacity and capacity building. Section 5.3 presents the findings and discussion on capacity and capacity building needs for natural capital. This section includes sub-sections for the data derived from the interviews on each element found in natural capital that was discussed by the participants. It also includes a sub-section titled discussion and is about the findings as compared to the literature and the content analysis of the documents. The final sub-section is titled key findings and provides a summary of the section. Sections 5.4, through 5.7 present the findings and discussion on capacity and capacity-building needs for economic, human, social, and institutional capital respectively. Each of these sections is further subdivided into each element or node discussed, a discussion section, and a key findings section following the format found in Section 5.3. Section 5.8 provides a summary of the chapter.

5.2 Capacity and Capacity-Building

Prior to discussing the findings for capacity, it needs to be mentioned that —as a province, as organizations, and as individuals— we do have capacity. As Max L., from a WPAC, stated: "Everything that we achieve, every success that we enjoy is work that simply would not have occurred had not we done it. And we have obviously the right capacity because we did it." In the quest to identify capacities and measure or advance the process of water governance, it must be remembered that achievements and successes have been made.

Further, some elements of capacities found in the data are not all positive or negative. Having capacity is not always a binary state. Sometimes a participant would speak to positive and negative aspects of capacity within a topic. As well, the information provided by the participant might have indirect connections to other elements than the one being spoken of. Tables 5.1 to 5.10 track the number of direct comments on positive capacity (DP), direct comments on negative capacity (DN), indirect linkages showing positive capacity (IP), and indirect linkages showing negative capacity (IN) for each set of capitals as organized by sector and by region. If the element was not discussed by anyone in the sector, the field is filled with a hyphen. There were not any particular sectors or basins that did or did not have capacity. In other words, the age, size, type or region of organization did not have bearing on an organizations' ability to have capacity.

There are fewer sub-themes, nodes, and sub-nodes for the overarching theme of capacity building than there are for the overarching theme of capacity. This is due, in part, to the nature of the interview, whereby the participant does not have the opportunity to prepare for the questions ahead of time. Some lines of questioning —such as being asked to determine where and how the system should or could be improved— would perhaps be better answered in a facilitated workshop since more than one participant said they could not think fast enough to come up with ideas.

5.3 Natural Capital Capacity

Five of the twenty six participants addressed the theme of natural capitals. Connection to nature and the provision of ecosystem services were the only two elements that came out of the interviews. Natural capital was discussed as personal reflection, from a community

beautification approach, from a societal attitude approach, and connecting natural capital to other capitals.

Connection to nature. Only one participant discussed his own connection to nature. Quinn S., a male provincial-level politician, stated in his interview that the area he grew up in was water sensitive. Having watched urban neighbours warn each other over lawn watering during water shortages as well as watching his father make decisions around locating livestock due to lack of water gave him a real sense of value and importance of water. This provided a portion of the impetus for his work in water. While this is a direct comment on access to or appreciation of nature, it is also an indirect link to participant's awareness of ecosystem services.

The conversation on community beautification came up in two participant interviews. Jerry R., an agricultural industry expert, saw a positive capacity for connection/access to nature. He equated the beautification of communities through programs such as *Alberta in Bloom* as a way to connect to the larger natural world. He also pointed out that the beautification process in some parts of the province would not be possible without the hard work having gone into building infrastructure to provide access to water. He reminded the interviewer that this included all of the infrastructure at the lakes that provide Albertans with access to recreation. This is another avenue we have to connect with nature. The overall beautification of communities is also an indirect linkage to the cultural aspects of ecosystem services.

Provision of ecosystem services. Another participant saw this process as a negative capacity in the individual and in society. As Lance P., a water practitioner with a large municipality, stated:

“The more we rely on water for less necessary purposes then the greater the risk in times of shortage that will create hardship. I think the challenge is that it's rarely urgent to conserve. I think that there is this cultural attachment to King Louis's lawn that is really really hard to overcome and there seems to be some manifest destiny, it is important to our identity to be an oasis in the desert, to stand out from the surrounding area as special, and that is one way that we accomplish that. Triumph over nature.”

This shows a lack of appreciation of the natural landscape and a lack understanding the consequences of overusing ecosystem services. Also showing a lack of understanding the consequences of overusing ecosystem services as well as conflicting values in access to nature, is the suggestion from James A., a non-government organization representative. He suggested that access to nature has led to damages to our water systems that is ignored until the problem is so big that remediation or repair is costly. People initially do not want to take responsibility or change their actions when problems first appear. Then when the problem has severely disrupted their activities, such as shutting down a lake for large periods of time due to algae blooms or fecal coliforms, they demand things be fixed. James A. suggested that if the fix is too costly, action will not happen. He also suggested this is an attitude that is common in the province.

Andrew R., a general expert, discussed ecosystem services in conjunction with other capitals as something the overall system was ignoring. He stated that by not fully understanding how natural capital effects aspects in social, human, and economic capitals, we don't place proper value on natural capital in our models and methods for measuring progress of all types. Andrew argued when we do value natural capital, it is with a dollar value in outmoded economic models. He stated,

"And of course the fear is always, if you don't make those valuations, then the value of those natural ecosystem functions is measured, for all intents and

purposes, is zero. And the values fall off the table when you make economic decisions with respect to resource development."

He argued that we need a better understanding of natural capital and its role with other capitals. This would provide a foundation to value natural capital in a way that reflects the economic, social and environmental world we have and would like to have.

Discussion. When comparing the participants' views to the literature, it is apparent that there is no consensus if there is positive or negative capacity in appreciation of/access to nature (see Table 5.1 below). With three negative comments and only two positive comments, there is a perception of an overall lack of capacity in understanding ecosystem services (see Table 5.1). When examining the comments by region, there is a more positive perspective on access to nature and ecosystem services in the South Saskatchewan watershed than those viewing it from a province-wide lens (see Table 5.2). Notably it did not come up in conversation with participants from either the North Saskatchewan watershed or the Athabasca watershed. This is perhaps due to regional differences in perceived water issues.

Table 5.1: Natural Capital Elements by Sector

Natural Capital				
Elements (n=number of mentions)				
Sector Type (n=total number interviewed)	Ecosystem Services (provisioning, regulating, cultural, and supporting)	Extractable Natural Resources	Income/ Jobs from Resource Extraction	Appreciation of / Access to Nature
Provincial Government (2)	-	-	-	-
Government Mandated Partners (5)	-	-	-	-
NGOs & LWSGs (4)	IN(1)	-	-	DN (1)
Local Government (8)	IN(1)	-	-	DN (1)
Industry (1)	IP (1)	-	-	DP (1)
Experts (6)	IP (1), DN (1)	-	-	DP (1)
Totals	Negative =3 Positive=2	-	-	Negative = 2 Positive = 2

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

Table 5.2: Natural Capital Elements by Region

Natural Capital				
Elements (n=number of mentions)				
Region (n=total number interviewed)	Ecosystem Services (provisioning, regulating, cultural, and supporting)	Extractable Natural Resources	Income/ Jobs from Resource Extraction	Appreciation of / Access to Nature
Athabasca Watershed (4)	-	-	-	-
North Saskatchewan Watershed (5)	-	-	-	-
South Saskatchewan Watershed (5)	IP (2) IN (1)	-	-	DP (2) DN (1)
Province-Wide (12)	DN (1) IN (1)	-	-	DN (1)
Totals	Negative =3 Positive=2	-	-	Negative = 2 Positive = 2

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

It is perhaps unsurprising that the stakeholder perspective on the role of natural capital is limited given the opposing arguments on natural capital presented in the literature. This is most easily seen in the opposing outcomes between Moore et al. (2006) and Webb and Curtis (2006), where the former found natural capital as being important to the role of natural resource management and where the latter was unable to find any support for including natural capital as their interview subjects argued that natural capital was the purpose of natural resource management. Nor is it any surprise that the elements of extractable natural resources and income/jobs from resource extraction were not found in conversations with the stakeholders. This is because all the stakeholders interviewed but one were not involved in the extraction of water for any purpose other than domestic or urban consumption. Also, none of the stakeholders derived their jobs from the direct extraction of water. There were no suggestions provided by the stakeholders to build capacity for any of the elements found in natural capital.

Key Findings. There are four key findings from the data that relate to natural capital. The first is that few commented on the importance of natural capital in a water governance

capacity. The second is there were only two elements of natural capital discussed by the participants. These were connection to nature and the provision of ecosystem services. The third key finding is that both negative and positive comments were made about the elements discussed. The fourth key finding is that this is consistent with the current debate found in the literature on natural capital.

5.4 Economic Capital Capacity

Economic capital was discussed in terms of four elements. These were 1) funding, 2) infrastructure, 3) resilience to market fluctuation, and 4) transparency. Twenty one participants spoke on funding. Resilience to market fluctuation and transparency each had one participant discussing the topic. Seven participants spoke on infrastructure.

Funding had the second largest number of participants discussing it in conversation and it came up as the fifth most discussed topic in all of the interviews (see Appendix F). Out of the twenty one participants discussing funding, most saw a negative capacity for funding (see Table 5.3 below). Some participants were able to speak of both positive and negative aspects of funding, which is why the total number of positive and negative capacity speakers is more than the number of participants speaking on the topic.

Those who saw a positive capacity towards funding were split between those able to get what they needed without much effort and those who struggled but were able to get funding. Those able to access funding crossed all sectors. For example, Kent J., a researcher, stated: "I don't have problems getting funding. I turn funding down. It's a point in my career. I mean we've had a number of successes, and so we are getting attention. So, I would guess that for each year in the last five, we've actually either given money back, or said no thanks to money." He also pointed out that this is a rather unusual situation for researchers. Four of the

participants from local governments also spoke positively on accessing funding. As Scott R, from a county, stated:

“[W]e’re provided good support for that and have had really good support from the provincial agencies that help to regulate that grant funding and ensure that we’re building it properly, and that we’re following the guidelines and that the money is being spent appropriately and efficiently.”

This sentiment was repeated by Bryan N. who said:

“No, I have no complaints. We’ve been very good on the grants side. AMWWP, Alberta Municipal Water/Waste Water Program, has been good to us. I can’t complain about that. We also receive an interest free loan on our waste water plant from Alberta Infrastructure, so I have no complaints.”

Transboundary groups were not only able to secure funding but were also able to secure it without a great amount of effort. For example, Telan S. said his group received funding from the different jurisdictions at the table and, due to the mandate of the group, "in general the capacity for manpower, for expertise and for dollars isn't a problem."

Not all groups found it easy to access funding in the same manner. One such group was Isabelle S's local stewardship group. It isn't as though the group couldn't get funding but:

“What happened is that we were successful last year in receiving the three grants that we applied for. You never know what you’re going to get so you apply for them all and when you get them all, you think, “Okay, now what?” That was about as much as we could manage and so that’s brought us to now, where I think we know we can’t go back to those funders right away. So we’ll need some new funding but we’ll need to identify new specific programs too.”

Dylan G., also from a local watershed stewardship group, said many organizations build their programs in a cycle that sees an organization first looking for funding, then building programs to fit the funding. His organization reversed this and first built their programs and then went out to secure funding. He argued that this has created successful and stable

programs for the organization. He argued that the way a group approaches funding can be detrimental to long term program planning and development and can affect an organizations efficacy and mandate.

WPACs were also able to receive funding. However three participants were divided on whether there is capacity and to what level that capacity might be. For example, Max L. stated that they do have funding to accomplish what they need to accomplish but:

“Well I certainly would never complain if the process of securing the necessary funds got easier but I understand that we’re not the only people on the planet who approach funders with good ideas. And I think in general, various funding agencies are doing the best they can with the resources they have. Any less time that we were able to spend on fund raising would be more time could spend on the actual project.”

This contrasts with Grace C.'s experience in that funding is the main issue. She pointed out that base funding from the government is not evenly distributed across the WPACs and accessing other funding can have issues with acceptance from members and residents in the region. It can cause problems because people will see accepting certain funding as representing a bias and perhaps permissiveness towards alternative funders and their activities. For her WPAC, the greatest expense is staffing and board honoraria, and these eat up their base funding leaving little for development of outreach and other work. She did point out that this does not affect the funding for basin management plans, as that funding is accessed separately. Randy D. said that the funding from the province as well as cash and in-kind donations from the municipalities is split roughly 50-50, for a rough total of seven million spent per year on WPACs. He asserted that the work received for this gives the people of Alberta about a 3 to 1 payback. He also argued that "progress and success are limited by the voluntary nature of participation and funding."

When participants were speaking on the lack of capacity in funding, they were most often speaking of grant limitations. Of the sixteen participants, nine said the available grants are limited both in number and scope. As Isabelle S. stated: "So what we're finding is that there's still places out there where you can get project money. Very little of it supports the infrastructure, the office, and the administrative costs." They had been able to access funding for administrative costs from some American groups but this type of funding ceased after the 2007 global financial crisis. That the WPACs and local watershed stewardship groups have difficulties due to funding is not something just they notice. Colin R., with the Alberta Water Council, pointed out the difference between funding and productivity expectations. He stated:

"Some of it is I guess, we may be lucky enough that we're looking at a provincial level issue and resourcing issues. They never promote only the financial point of view; have always been there for us. We would be very challenged if it wasn't there. We wouldn't even function to tell you the truth. But if you take the WPAC world, they pile on a lot of stuff to them and they don't resource them maybe as well as they should and so there's a tremendous expectation on what they should be doing and the resources aren't there or the capacity isn't there."

Several of the participants working in local governments said that while grants exist to upgrade or replace plants, uptake equipment and reservoirs, nothing is available for the collection and distribution of water and wastewater. As Scott R. stated:

"At times, that's quite challenging for us. We have a hamlet and we build their sewer lines, it's difficult to raise funding off your rates. We're not in the economics of scale here. How do you rebuild the sewer line, how do you charge them enough in their rates and to recover enough so we can build the future? That's really a challenge for us, these hamlets."

This was reiterated by Bryan N. who observed that a cost sharing program with provincial and federal governments for infrastructure has been terminated. He said that he

had been told that it would either start up again or there would be a new program filling a similar function but that hasn't happened yet. One participant, Lauren C., discussed how difficult it can be when the provincial and federal government changes the regulations on water and wastewater. She stated:

“I had to prepare a budget by the end of August but our drinking water safety plan won't be completed until December. How that is going to affect our budget, I'm not really entirely sure. It's going to make it interesting for sure depending on what comes out of it. There are no grants set aside for that, there is no help from the government to assist in these regulations that they now stamped on us.”

Even larger local governments have difficulty finding grants to build or upgrade water infrastructure. Anthony H. suggested it was difficult to access the provincial grants as they are typically geared towards small communities that struggle with funding large projects. The 1/3-1/3-1/3 programs between the municipality, provincial and federal governments are for all types of infrastructure and water or wastewater infrastructure is not always a priority.

Regardless of the debate over funding, two participants argued that the focus and, in some cases, methods spent on securing funding was problematic. Dylan G., from a LWSG, asserted that with funding becoming scarcer and difficult to find, non-profits and small groups are turning to corporate-driven, vote-based funding, hoping that the public will find the project worthy enough. This type of funding is where large companies, such as Coke or Shell, attempt corporate social and environmental responsibility by providing funding. Organizations apply and then have their applications posted to a web site by the company. The public are encouraged to vote for their favorite and those applications with the most votes secure their funding. Dylan G. stated:

“What it ultimately means to me is, it's a massive distraction. To try to positively channel people to a Web site to say, you know, “Vote for us in this list

of worthy projects.” It’s basically almost creating an Orwellian type of world, where worthy projects are always being compared and we’re competing against each other for corporate favors. Most of the people who would be interested in water, for example; there’s a core of that concerned citizen, who cares about water, where you’re forcing them to be, “Well, this group is also looking for this. Like, do I have to choose? Can’t they fund all of them?””

He also asserted that it becomes a popularity contest that only organizations with large memberships —and organizational ability to mobilize that membership— can win. He pointed out that this type of funding changes the nature and purpose of conservation, protection, and stewardship groups. He suggested that an organization might hesitate to create programs that could bring a corporation, government, or sector to task for their actions or change the way they conduct their activities if their only means of funding are corporate-driven popularity contests. Environmental organizations are often at odds with these same corporations providing the funding. His example was a hypothetical organization bringing a lawsuit forward over the changes to the federal fisheries act allowing for easier pipeline construction under certain waterways. He asked whether a large oil and gas corporation that administered an environmental grant or funding program would fund something potentially detrimental to themselves. At the end of the day, Quinn S., a politician saw the WPACs and local stewardship groups as losing the focus on their mandates. He stated: "...[T]hey're struggling to survive, right? The provincial government cut their budget. The cities cut their budget, so they are struggling to survive. Their focus is on survival instead of doing what they should be doing."

Funding was the key area that participants said needed capacity-building. Participants were not suggesting major increases to amounts available, rather they were wanting financial capacity built through long-term planning. Several participants said it would be helpful to know that one's funding will be guaranteed for x number of years. Suggestions

for number of years ranged from two to five. This would allow an organization to plan for the long-term, develop succession plans, and long duration projects and programs. They stated that the one-year funding cycle detracts from actual work being done due to the amount of time spent on trying to secure the next year of funding. One participant suggested that participation in a WPAC be mandatory, with base funding made on a per-capita basis.

Resilience to Market Fluctuation/Transparency. Some discussion took place as to whether it was a lack of funding or more a lack of resilience to market fluctuation and transparency to spending, especially at the level of the provincial government. The 2013 flood was used as an example of how funding priorities have gone astray and, in the short term, might impact the local governments from achieving their water and wastewater projects. Andrew R., an expert, stated that:

“We have got to go back to the very fundamental basics of why evacuation orders were made before our flood warnings were posted. Our prediction system is completely inadequate. This goes to this capacity thing. We've cut our government and institutions, because every time there is an economic focus that's on other things. We've cut our monitoring. We've cut our flood prediction systems, and I don't blame these guys. I mean, I'm not blaming individuals in the Alberta government or Alberta Environment and Sustainable Resources Development. You got to have tools. You got to have good models. You got to have good linkages between hydrological and meteorological models that are available to us.”

He asserted that the cost to the province and the people for this and future floods is only going to increase. He spoke: "The fear is, is that you can't afford to do both. You can't afford to pay for the compensation and recover from the damage and also, at the same time, pay for what needs to be done to protect yourself. Then you're in trouble." One participant, interviewed twenty-five days after the flooding in southern Alberta, was

already thinking about the short term impacts to projects in other areas of the province.

As Scott R. stated:

“With all this flood emergency stuff down in southern Alberta, I’m thinking the next two or three years is going to be really, really challenging to do any kind of water, sewer, road infrastructure work. It’s going to eat up all the resources, all their construction, all the materials. The next couple of years for us will be challenging and expensive to get anything done. How long does that go? Like I said, the old Alberta problem, the oil field goes boom and you’re in trouble. Now you’ve got an active economy plus a whole lot of hurt down there. It’s going to get fixed. We’re going to be indirectly affected by that.”

Infrastructure. Another economic capital that appears in the interviews is infrastructure. Local governments are directly responsible for the provision of water, wastewater, stormwater, and fire system infrastructure in their boundaries. Therefore they were the ones who spoke most on it. These conversations were mainly around what they have and the condition of it. While no local government was able to secure funding for all projects all the time, those that were larger, near a large centre, or were willing to embrace non-traditional solutions seemed to be better positioned. For example, one county was quick to capitalize on the widening of a highway in their borders. The widening would have required the removal and replacement of a stand-alone water plant in a hamlet. The county argued that it made more sense to run a water line from a nearby village already in the regional water commission, even though it would be more expensive. In this case, the province agreed and the hamlet is now linked into the regional water commission.

The above example contrasts with the experience of Lauren C.'s more isolated community. Not only have they struggled to put in place an infrastructure and asset life

cycle management system, but they've also faced a situation where regional growth outstrips infrastructure capacity. As she said:

“There has been no reserves set aside for any of our infrastructure maintenance which is a serious issue as we’re now reaching where our infrastructure is fifty years old. It’s exceeded its lifetime abilities or expectations and so we’re in an interesting position. We are working towards next year, hopefully having those revenues come back in with a percentage going back to the general pool but also a percentage going back into reserves to replace our infrastructure.”

For a community that has never implemented a life-cycle or asset management program, this is a monumental project in and of itself, something that will require serious funding and commitment on top of the actual repair and/or replacement of aging infrastructure. Population growth in the region has brought asset management and the need for replacing infrastructure to the forefront for this community. The concern with the increasing population is safety. They have an agreement with the county to provide drinking water and water for fire suppression. At one point the town had discussed a moratorium on new sub-divisions in particular locations that would be difficult to achieve and maintain water pressure. The county decided to build a sub-division in one of those locations regardless and "Their hydrants out there give out 25 litres per second. The fire pump takes out 95 litres per second."

Another smaller municipality is concerned about meeting the regulations for water storage. Nathan M. said his community is required to have storage for their new water regionalization system for three or four days but they only have storage for two days. Their main storage unit is an aging water tower. There are concerns that it has structural issues and it needs to be replaced but they do not know when they will get funding. The local government wants and supports funding to replace the water tower and to increase storage by another two days but the province has been slow to respond and rejected their

first application. Nathan argues that expansion to the storage is a need that is directly due to regionalization and as this is the direction the province wants taken, they need to fully support this.

Although there are communities that seem to miss out on accessing funds to build infrastructure, Quinn S., a politician, pointed out that infrastructure was one of the components to the *Water for Life* strategy. He pointed out that in some places, the infrastructure built and/or the projects selected were not always based on the highest need. He said "What the government has done was spend a lot of money on infrastructure. That gets you votes, right."

Whether money spent on infrastructure gets a government votes or not is debatable. What building infrastructure does do, is to boost economic growth. As Lance P., a local government participant, pointed out:

"In the context of infrastructure investments there are some significant spinoffs. There are engineering offices, and contractors, machine dealerships and rentals, and other types of businesses and activity that can spin off of physical infrastructure investments. In the context of replacement of infrastructure like lifecycle replacement and the expansion – land development and new neighborhoods – is an even greater amount. In the end those investments that are paid for through the sale of the residential lot. When you're buying a parcel to put a house on it, the price includes the sidewalk and the pipes under the streets and pavement. It is a significant driver of economic activity to put the infrastructure into the ground."

While there is a boost to economic growth, Grant K., an expert, suggested that we should be reminded that there is a cost for us to access water. He stated: "There is this whole idea of safety, security, and access to water supplies for human consumption. We have to provide a high level of assurance of that, but that doesn't mean it's free and it doesn't mean it's cheap, but it should not be prohibitive, so we have that." He also pointed out

that environmental performance, or the health of the environment needs to be included when determining the economic benefits of water. He argued that ensuring access for human consumption and healthy environmental performance are key to removing barriers to economic growth. While this is a direct comment on economic growth, it is also an indirect comment on the capacity of harvested resources under economic capital.

Infrastructure was the only other area in economic capacity that participants suggested needed capacity-building. They suggested that long-term planning for finances would assist life-cycle planning of infrastructure. Some participants mentioned that municipalities were not allowed to practice life-cycling —the process where the anticipated cost of an item is divided amongst the number of years that the item can be expected to last before needing replacement and then set aside annually so that money is available when needed. This would reduce the overall amount required in the cost-sharing of projects which most municipalities need as they cannot afford to build or replace infrastructure on their own. As Lloyd S. explained:

“[The project] was \$32 million, my budget is only that for a year and I have to run a whole municipality on that. Half of that typically goes to road projects. That could be one full year, or if I divided it up over a number of years, how do you save up that money and then do it? I can't even borrow that amount of money. That's beyond our capacity to borrow. Cost-sharing and assistance from other parties is what makes it happen.”

By not knowing when a grant application might be approved, it is difficult to determine when there will be enough funding available for infrastructure projects. This in turn can cause a backlog on other infrastructure that may be nearing the time for replacement.

Discussion. That funding and infrastructure was so thoroughly discussed by participants should not be a surprise. The literature shows infrastructure as a stand-alone

element under economic capacity as well as six other elements under finances. These were government budgets and cash flows; diversity to community cash streams; grass root access to grants; access to markets; resilience to market fluctuation; and transparency and accounting. The conversations covered five of these, albeit with some sectors focused more on some than others (see Table 5.3 below).

Table 5.3: Economic Capital by Sector

Economic Capital								
Elements (n=number of mentions)								
	Physical	Financial						Produced
Sector Type (n=total number interviewed)	Public Infrastructure (Utilities, Dams, etc.)	Government Budgets and Cash Flows	Diversity to Community Cash Streams	Access to Markets	Resilience to Market Fluctuation	Grassroot Access to Grants	Transparency & Accounting	Harvested Resources (water, fish, etc.)
Provincial Government (2)	-	-	-	-	-	-	-	-
Government Mandated Partners (5)	-	-	DN (1)	-	-	DP (4) DN (3)	-	-
NGOs & LWSGs (4)	-	-	DN (1)	-	-	DP (2) DN (4)	-	-
Local Government (8)	DP (3) DN (4)	-	-	-	DN (1)	DP (4), DN (6)	-	-
Industry (1)	-	-	-	-	-	-	-	-
Experts (6)	DN (1)	IN (1)	-	-	-	DP (1), DN (2)	DN (1)	DN (1)
Totals	Negative = 5 Positive = 3	Negative = 1	Negative = 2	-	Negative = 1	Negative =15 Positive =11	Negative =1	Negative = 1

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

For example, local governments were concerned about resilience to markets in the sense of needing to buy goods and services for infrastructure purposes. This, along with infrastructure, was not a concern to others. It should also be pointed out that although access to funding was thoroughly discussed, the descriptors found in the literature do not lend well to the Alberta water governance structure. As local governments as well as all grassroot groups (aka NGOs and LWSGs), provincially mandated partners (AWC,

transboundary groups, and WPACs), local governments, and many experts (researchers for example) are eligible for grants provided by the provincial government. Indeed, for many of these organizations, provincial government grants are the only way they have to achieve full funding for specific things like physical infrastructure for programs. This means that most of the conversation on funding falls under the grassroots' access to grants. Overall, there is a perception of negative capacity for all funding elements across all sectors who discussed economic capital. Infrastructure overall was seen as having a negative capacity, especially by those unable to access grants in a timely fashion in order to replace or expand existing infrastructure.

When looking at the positive and negative comments by region, it also shows that a negative capacity is seen across the elements of economic capital (see Table 5.4).

Table 5.4: Economic Capital by Region

Economic Capital								
Elements (n=number of mentions)								
	Physical	Financial						Produced
Region (n=total number interviewed)	Public Infrastructure (Utilities, Dams, etc.)	Government Budgets and Cash Flows	Diversity to Community Cash Streams	Access to Markets	Resilience to Market Fluctuation	Grassroot Access to Grants	Transparency & Accounting	Harvested Resources (water, fish, etc.)
Athabasca Watershed (4)	DP (1) DN (2)	-	DN (1)	-	-	DP (1) DN (3)	-	-
North Saskatchewan Watershed (5)	DP (1) DN (1)	-	DN (1)	-	DN (1)	DP (4) DN (6)	-	-
South Saskatchewan Watershed (5)	DP (1) DN (1)	-	-	-	-	DP (2) DN (3)	-	-
Province- Wide (12)	DN(1)	IN (1)	-	-	-	DP (4) DN (3)	DN (1)	DN (1)
Totals	Negative = 5 Positive = 3	Negative = 1	Negative = 2	-	Negative = 1	Negative =15 Positive = 11	Negative =1	Negative = 1

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

The one exception to this is found with the province-wide overview on grassroots access to grants. This is because that the quasi-governmental organizations that operate provincially, such as the Alberta Water Council and the transboundary group, acknowledge that their mandates are seen as important and are invested in by the provincial government. Non-profit organizations that operate provincially also have easier access to funding as they are often connected to other inter- and intra-provincial and international organizations. This gives them access to funds and fundraising expertise that are not necessarily available to smaller groups or local governments.

Being able to access resources was one of the first capacities identified in the early literature (Chaskin, 2001; Beckley et al., 2008). Where Chaskin (2001) suggested social agency is responsible for accessing resources by tapping into a larger network of individuals, organizations, and businesses who in turn provide goods and services, finances, and information dissemination; Beckley et al. (2008) argued that that capacity is dependent on the assets (including finances) on hand as well as tappable through the larger network. In other words, researchers such as Chaskin (2001) and Beckley et al. (2008) see funding as just one of many capacities to be accessed. This fits for a few of the participants. These participants have an organization with a mandate considered to be critical enough to the success of water governance that they have on hand or are able to access enough funding to fully meet their current and future mandates. The remaining groups—even though they are identified as important to the *Water for Life* strategy—better fit the concept put forward by Morgan (2006). He argued that finances provide a mechanism that gives an individual, group, or business the capability to act. In other words, you need finances in order to achieve your mandate or to access other resources

that will allow you to do so. For most of the participants, although they do have enough success in finding funding to be able to meet their mandates, looking for ways to access funding is a continual process that uses up other capacities that could be better used elsewhere. Of those interviewed, one local watershed stewardship group, two towns, and one of the WPACs struggled to access enough funding to meet their mandates around water management. For some of these, the way funding agencies distribute funding can cause the mandate and programs of the group to change in order to receive funding to continue as a group.

Although economic growth did appear in conversations, the concept does not appear as an element under economic capacity in the literature. The participants saw economic growth as something that is generated due to positive experiences in building and maintaining capacity in infrastructure. It is important enough as a direct outcome of their particular stakeholder role in water governance that they brought this topic up. Specifically, it was a positive outcome spun off from infrastructure maintenance, replacement, and expansion—which is an element under economic capital—and could be an indirect indicator of positive capacity used in future research.

Provincial government documents show that economic capital has not had as much support as other topics. In six key documents since the start of the *Water for Life* strategy, the words economic, economy, and productivity all appear in the top 100 of a query for the most used words over four letters (see Table 5.6 in Appendix G) (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012). However these words are ranked 74th, 79th, and 85th respectively. When reviewing the locations in the documents where these words are found, it shows that they are used less about supporting the organizations

involved in water governance and more about evaluating, documenting, and ensuring adequate supply of water for economic purposes (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012).

Key findings. There are eight key findings from the data that relate to economic capital. The first is that there were seven elements of economic capital discussed by participants. These were funding (3 different aspects); resilience to market fluctuations; transparency; and infrastructure. The second key finding is that access to funding is critical to the existence and continuation of all groups, departments, and organizations involved in water governance. The third key finding is that all organizations were able to access funding but some participants' organizations struggled to access appropriate and/or adequate funding. The fourth key finding is the physical infrastructure (other than dams and irrigation) is a topic of discussion for local governments but not other groups. The fifth key finding is that resilience to market fluctuations is linked to the ability to fund and build new or replacement infrastructure in a timely manner. The sixth key finding is that funding is linked to infrastructure. The seventh key finding is that the ideas about economic capacity put forward by Morgan (2006) are more suited to the situation found in Alberta than those put forward by Beckley et al. (2008) or Chaskin (2001). The eighth key finding is that the government is more focused more about evaluating, documenting, and ensuring adequate supply of water for economic purposes than on the economic support of organizations.

5.4 Human Capital Capacity

There were three nodes found in the conversations with the stakeholders. These were 1) board, staff, and volunteer development, 2) internal skill transfer, and 3) leadership.

Nineteen participants spoke on board, staff, and volunteer development. Leadership had

five participants who spoke on the topic and internal skill transfer had four speakers. These nodes are further subdivided into topics of human resources development and education; job experience; leadership; life experience; and individual health.

Human resources development and education had the fourth largest number of participants discussing it in conversation and it came up as the fourth most discussed topic in all of the interviews (see Appendix F). Out of the nineteen participants discussing the topic, most spoke about recruitment, retention, and training. While training received more positive comments than negative, participants did not come to agreement on the capacity of recruitment and retention (see table 5.5 below). Some participants were able to speak of both positive and negative aspects of recruitment, retention and training, which is why the total number of positive and negative capacity speakers is more than the number of participants speaking on the topic.

Staff recruitment and retention were more often discussed as a positive capacity than not. Participants were able to recruit and, for the most part, retain paid staff. Several pointed out special features of either their community or their organization that helped them in staff retention. A few acknowledged that staff recruitment often meant poaching people from other places and groups. Telan S., a government mandated partner expert, said that the level of governance that they work at requires them to have experts that have the right mix of education, training and skills. They do not have much of a turnover and when they do have to replace staff, it can take time to get the right person. This does mean that they actively recruit specific people, even if they work for other organizations. Dale H., a water expert from a local government, said proximity to a larger center really helps them out. He stated:

“We’re fortunate in the sense that we’re a little bit close to the city, and we have more qualified staff than what we require. We have long term qualified staff, and in fact, we’ve been asked to provide assistance in other locations because of our expertise. We don’t have that problem, we run our system here, and so we have qualified staff and we have no problem recruiting or retention of that staff.”

Rick D., from a local government, agreed that recruiting and training staff was also not a problem for his local government. He pointed out that as a unionized place they were able to recruit from within their organization and pay their workers a decent wage compared to many other smaller communities. With regard to recruiting, the quality and ability of board members was also positively commented on by Randy D., from a WPAC. He stated:

“There has been a great potential and continues to have big great potential here. We just had our AGM and we just recruited half a dozen new directors, excellent people. You know, from intellectual capacity we have some pretty solid people at the table so it is good and I say it one more time, it is a bargain to have this kind of group of people and staff working for \$250,000 bucks which is price of a senior bureaucrat.”

Four participants discussed recruitment and retention in terms of negative capacity.

Bryan N., from a local government, said they get many workers from out of province, usually through current employees. They struggle to keep these particular employees due to difficulties in getting their training acknowledged or recognized as legitimate by the government. He also pointed out that there are fewer people entering water and wastewater operator type jobs and, with an aging workforce on the edge of retirement, this will be a problem in the near future. Rick D., from a local government, pointed out that while his organization doesn't have a retention problem, small communities do. He said:

“The hamlets suffer because they don't have enough of a tax base to pay their water people and they have to do so many other things like run the grader. So once those guys get their certification they are gone. The young guys though,

they are all going to Fort McMurray because you can go to NAIT and take a program then start up there and get your hours then write your exam, you don't need to do all the extra training and they get a starting wage of \$100,000 before you even have your level 1. It is not just in water either but in pulp and paper, everything. Why stay in your small town when you can make that?"

It was pointed out by Lance P., from a local government, that occasionally larger places might not have a recruitment problem but do have a retention problem, especially with younger workers. He stated:

"It has been difficult for the city to retain really young people as well. We are not hip enough. Sometimes we are successfully recruiting someone but if they spend every weekend in [large centre] for the action then it's usually it's less than a year or two and they find an opportunity that is in a larger more urban center."

Nathan M. spoke extensively on the difficulties his local government had in recruiting and retaining staff who have a specific level of training. He said that they are required to have a minimum of three workers with level two training to oversee all work. This ensures that there are enough people to cover all hours of the day and cover each other's shifts while sick or on holidays. He said they are not allowed to be more than two hours away from the plant when they have less than three staff with level two training. At the time of the interview, his community was short one level two. That person had started, trained to level two, and then left. Nathan and the other operator will not be allowed to have a holiday until a new operator is hired and fully trained. He said this was a problem throughout the region and he knew of one operator nearby who quit after not having a holiday in seven years.

Job Experience. All participants who spoke on training staff were positive on the subject. Local governments provide their water and wastewater operators with time to attend courses and write exams as well as attend the annual conference held in Banff.

While this is a major event for the water and wastewater industry to network, there are also talks and presentations given that count towards the operators' education credits. Non-profits, for-profits, and quasi-government groups were also providing training opportunities to their staff. As Patrick W., a water expert, discussed, one area of attention was new and young workers. He said:

“One of the key visions of the organization is mentorship, personal growth, gaining experience when you're young, getting that first job so you can get enough experience to go on to other things. When I look around at the people here, most of them are very talented young people who are looking to do something that makes a difference in the world, and to gain experience both on individual projects that they work on, but also working with old guys like me, and [the CEO] even more so, and others, to learn. It's definitely a capacity building organization and I think that's part of its vision and goal.”

He also pointed out how this focus was more than just being a supportive work environment. He pointed out that we are facing an aging workforce and we need to ensure that there are those ready to take over from the retirees.

One area that lacks capacity is internal skill transfer. This is not knowledge accumulation and dissemination, rather it is the skills learned during a project that appear to not transfer to the next project. Four of the twenty-six participants discussed this type of situation. Max L., from a WPAC, described the situation as:

“One of the enduring challenges I think of our WPAC, perhaps shared by others, is we are [x number of] years into it in our current incarnation and it still seems like we are doing everything for the first time. We are having to develop new techniques and we're not fully able to enjoy the benefit of always using previously developed techniques because each project seems to be different enough that there is not always as much advantage as we would like, translating one project into another.”

Another participant, Andrew C., from a provincial government department, suggested that part of the problem is the turnover rate of board members. He asserted that this creates a need for the same skills to be imparted with little opportunity to build on them.

Leadership was one area that participants suggested was short on capacity. As James A., from an NGO, mentioned "The people sitting around the board, most of them haven't been on boards before, so there's a whole lot of wild opinions when you're trying to get stuff done." He said one provincial government department ran free board development workshops but he felt the focus for those were more on policy development. He suggested that it was not enough and didn't train board member on how to be a board member. Colin R., a government mandated partner expert, was more specific. He said it would be nice if board members came to the table already trained on collaborative or multi-stakeholder consensus processes. Colin R., Anthony H., and Quinn S. also said there needed to be a way to encourage champions to participate at the board level. They argued that these types of people —local government council members and senior level elected and civil service members— have vast networks and resources that they are able to influence and tap into.

Life experience. Grace C., from a WPAC, said that we need a way to prepare people to participate in any participatory process in planning. She asserted that the average person doesn't understand the purpose of most plans or the rationale for the collaborative process. Nor do they get the language used and the technical aspects needed to make any particular plan. This can cause frustration and makes it hard to convince people of the necessity of the process. Randy D., also from a WPAC, also said it would be good if people who participate in the planning process have some understanding of the laws in Alberta, what can and cannot be done through a plan, and what a good planning process is.

Individual health. Three participants spoke on burnout. For organizations lacking funding to either hire or pay for staffing, burnout is a concern. Isabelle discussed how they were unable to keep a paid executive director. They then looked for grants that would let them hire contract people to run specific programs which relieved the stress on the volunteers. She pointed out that burnout in the overall local volunteer community is a concern. She stated:

“We are getting very close to that and we’re not sure what to do about it, to be perfectly honest. In this community, it’s recognized, and probably in all communities now. We sometimes think it’s because we’re a small community but I think it’s probably the same in cities. That young people are very busy and don’t volunteer to the same extent as maybe we used to when we were younger. Or they volunteer in activities related to what their kids are doing. It’s difficult. They don’t have time to do this kind of thing. People that are committed volunteers commit themselves. They’re already committed for the most part. It’s just really a challenge to find replacements for yourself.”

James A., from an NGO, agreed that having a paid executive director to handle the necessary day-to-day operations of the organization is crucial. He said that the best thing that they did was to get a full-time executive director. Nathan M., from a local government, said that staffing and all it entails is really important. Burn-out and stress levels are high in his region because they keep losing people and can't take holidays. He did say that they are unionized and there is some care and support because of the union but it is only for a few weeks. He asserted that there needs to be a balance in the numbers trained at level two to prevent burn-out. Nathan suggested one way to build capacity and avoid burnout would be to create an integrated training program that trained all the operators in a region on each other's systems. He suggested that this would allow operators to help out across the region in emergencies by substituting for each other. This would also give the operators an opportunity to meet and network with each other. He

argued that the province has pushed the idea of regionalization of the water plants but they have not done anything with the training and staffing aspect.

Discussion. With the examination of the interviews and the information in the literature on human capacity, it appears that only five of the nine elements were discussed by the participants (see Table 5.5 below). These elements are 1) education, 2) job experience, 3) life experience and acquired skills, 4) individual health, and 5) leadership. Workers and volunteers' formal knowledge accumulation prior to entering the water sector is under the element education. Job experience refers to the on-the-job training and other education opportunities provided by the employer. Life experience refers to the informal knowledge accumulation prior to entering the water sector. Individual health is linked to the discussions the participants had on burn-out. Leadership attributes cover board development but not staff and volunteer development. It also is important to realize that participants spoke of recruitment and retention when asked about human capital, even though these are aspects found in human resources development which is an element in institutional capital. The participants did not separate education and on-the-job experience (in the form of training) from recruitment and retention in the discussions. For the purpose of analyzing capacity in Alberta's water governance structure, it is suggested that the element of human resources development (recruitment and retention) be moved from institutional capital and placed under human capital.

From the conversations and examining the way the data sorts by sector, it can be seen that training is largely institutionalized and has a positive capacity but leadership skills are lacking and further education is needed. The local governments have a more formal training system whereby the water and wastewater operator is trained apprenticeship-

style, with required hours on the job as well as formal hours in a classroom or at the provincial annual water/wastewater operators' conference. Most organizations use on-the-job training with informal methods to pass on required knowledge. The one mention of formal education was in discussion of the quality of the knowledge of one organization's board volunteers. The participant mentioned that his board had members ranging from planners to environmental specialists—all of which require extensive formal education. This is different from the literature, where formal education is seen as universally important (Chaskin, 2001; Moore et al., 2006; Webb & Curtis, 2006; Beckley et al., 2008; Robins, 2008a). Job experience, life experience and acquired skills are newer additions to the literature, as is leadership (Chaskin, 2001; Beckley et al., 2008; Robins, 2008a; A. C. Taylor, 2010; A. Taylor, Cocklin, & Brown, 2012).

Table 5.5: Human Capital by Sector

Human Capital									
Elements (n=number of participants)									
Sector Type (n=total number interviewed)	Education	Job Experience	Life Experience & Acquired Skills	Individual Health	Entrepreneur- ship	Leadership	Human Resources Development	Willingness to Participate	Diversity
Provincial Government (2)	-	DP (1)	DN (1)	-	-	-	-	-	-
Government Mandated Partners (5)	DP (1)	-	DN (3)	-	-	DN (2)	DP (3) DN (1)	-	-
NGOs & LWSGs (4)	-	-	DN (1)	DN (2)	-	DP (1) DN (1)	-	-	-
Local Government (8)	-	DP (4)	-	DN (1)	-	DP (1) DN (1)	DP (4) DN (5)	-	-
Industry (1)	-	-	-	-	-	-	-	-	-
Experts (6)	-	DP (4) DN (1)	-	-	-	DP (1) DN (1)	-	-	-
Totals	Positive =1	Positive =8 Negative =1	Negative = 5	Negative =3	-	Positive =3 Negative =5	Positive = 7 Negative =7	-	-

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

The data also shows that overall there is no agreement on the capacity of retention and recruitment. However, when the data are examined by sectors, local governments have more negative perceptions of capacity than government-mandated organizations. This perspective is fairly consistent across regions (see Table 5.6 below).

Table 5.6: Human Capital by Region

Human Capital									
Elements (n=number of participants)									
Region (n=total number interviewed)	Education	Job Experience	Life Experience & Acquired Skills	Individual Health	Entrepreneur- ship	Leadership	Human Resources Development	Willingness to Participate	Diversity
Athabasca Watershed (4)	-	-	DN (1)	DN (1)	-	-	DP (2) DN (2)	-	-
North Saskatchewan Watershed (5)	DP (1)	DP (3)	DN (1)	-	-	DP (1) DN (1)	DP (3) DN (2)	-	-
South Saskatchewan Watershed (5)	-	DP (1)	-	DN (1)	-	-	DP (1) DN (2)	-	-
Province- Wide (12)	-	DP (4) DN (1)	DN (3)	DN (1)	-	DP (2) DN (4)	DP (1) DN (1)	-	-
Totals	Positive =1	Positive =8 Negative =1	Negative = 5	Negative =3	-	Positive =3 Negative =5	Positive = 7 Negative =7	-	-

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

The literature also discussed the importance of entrepreneurship within human capital however, it does not appear in the conversations with stakeholders about Alberta's water governance structure. This could be due to the fact that Alberta has a strong "first in time, first in right" water allocation system that, although allowing for some trading, is not freely traded or accessed without government oversight (Bjornlund, Zuo, Parrack, Wheeler, & de L oe, 2011; AESRD, 2012). In other words, there is little incentive for entrepreneurs to use water as the focus of economic enterprise. In the literature, there was only one key paper for each of the elements of willingness to participate and diversity

(Chaskin, 2001; Webb & Curtis, 2006). Neither concept came up in the interviews, however it may be that these are elements that are found in the structure but not spoken of in these interviews.

Provincial government documents show this is another area that has not had much support. In six key documents since the start of the *Water for Life* strategy, the word education appears in the top 100 of a query for the most used words over four letters (see Appendix G) (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012). However this word was ranked 83rd in the list. Education is used in context less about providing training of staff, board members, and volunteers of various groups, departments, and organizations involved in water governance and more about providing public education and outreach as well as providing research direction (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012).

Key Findings. There are eight key findings from the data that relate to human capital. The first is that there were only five elements of human capital discussed by participants. These were 1) education, 2) job experience, 3) life experience, 4) leadership, and 5) individual health. The second key finding is that a new element, human resources which covers recruitment and retention, needs to be added as a new element to human capital. The third key finding is that the element indigenous and local knowledge fits as an element of social capital rather than human capital. The fourth key finding is that the majority of comments about job experience and education were positive. The fifth key finding is that all of the comments about life experience and individual health were negative. The sixth key finding is that the majority of comments about leadership were negative. The seventh key finding is that there were an equal number of positive and

negative comments about human resources development. The eighth key finding is that the literature on human capacity partially matches the experiences and perspectives of the participants.

5.5 Social Capital Capacity

Six nodes were identified in the conversations with the stakeholders. These were 1) knowledge building and dissemination, 2) networking, 3) individual values, attitudes and behaviour 4) motivation, 5) collective action and participation, and trust. Twenty three participants spoke on knowledge building and dissemination. Sixteen spoke on collective action and participation. This node was through the topic of collaboration. Networking had fourteen participants who spoke on the topic. There were nine participants who spoke on individual values, attitudes and behaviour. Motivation and trust each had three participants.

Knowledge building and dissemination had the largest number of participants discussing it in conversation and it came up as the third most discussed topic in all of the interviews (see Appendix F). Twenty-three out of twenty-six stakeholders took time to discuss their knowledge building and dissemination efforts. This discussion often took place after being asked to think of a successful project and explain what it was, why it happened, and what made it a success. Nineteen participants spoke positively on knowledge building and dissemination and six spoke negatively.

There are two layers to knowledge building and dissemination. The first is internal to the stakeholders involved in water governance. This is where water practitioners attend forums and conferences to learn from each other and from other experts about in-depth and/or technical topics to do with water and wastewater governance, water quality, and any developing water issues. Conferences and forums are arranged and hosted across the province by government departments, WPACs, NGOs, local government associations, and

discipline or water/wastewater associations. Many departments and NGOs are pleased to discuss water and water management with other like-minded groups. Colin commented that "We do make ourselves available to go speak to anybody that basically asks us and it makes sense that they're a group that wants to hear our messaging and kind of what we're doing."

Interaction with the public is the second layer to knowledge building and dissemination. This area involved education and outreach with the public as well as public relations work to the public. Some public outreach and education takes place for specific reasons such as watershed management planning. Andrew said:

“...we have what we call hydrology 101, limnology 101, and we invite not just the steering committee members but we invite all, anybody who's originally interested to come and listen to people talk about specific topics related to the watershed and we talk about anything from ecology, fisheries management, hydrology, water ecology, the whole gamut of what you would normally see in watershed management plan.”

Local watershed stewardship groups, NGOs, and local governments also reach out to the public. They run programs and events to educate on specific topics by hosting speakers and information sessions, conducting school visits and talks, and preparing literature on the local watershed. They also provide opportunities for the general public to get directly involved in their watershed and build their knowledge. This happens through short, one or two day events such as weed pulls, riparian garbage cleanups, and biodiversity counts. Outreach can also happen through longer running programs such as advisory forums set up by local government, pollution awareness and abatement programs, and invasive species programs.

Of the six participants that spoke of a negative capacity in knowledge building and dissemination, one spoke on the need to break silos in various water-related workers and five spoke on the lack of general knowledge on the topic of water within the general public. On speaking of silos, Andrew R., a water expert, stated "They become so

specialized in their thinking and project orienting, that they lose touch with that glorious larger sensibility and the capacity to think more broadly and to absorb information, new information, widely." He argued that the silo effect of certain professions, along with concerns over inter-generational knowledge transfer, is a problem as the issues we face today in water and water management requires us to be aware of the knowledge being built in other professions.

Those that spoke about the need for better general knowledge in the public point out that certain actions by the public seem to underscore the idea that the message of the value and importance of water is not getting through. As Lance P., from a local government, spoke:

"We are often challenged with the "20th century oasis in the desert mentality" where rather than working with nature and accepting that this is a semiarid place, we are often pushed against the need to have Kentucky Bluegrass brilliant green and cut five times a week. So I think that there is a lot of room for improvement in the context of local knowledge and appreciating the climate and the bigger context."

Lloyd S., from a local government, also pointed out that people seem to have difficulty with the long-term variation to water levels and volumes. They don't understand, and are often upset, by the fact that lake and stream levels can change, especially when the change effects their property. His example was of a lake lot owner who has watched the level of a lake drop due to change in runoff and precipitation. This lack of understanding can extend to elected officials holding office in local governments. As Lauren C., a water practitioner in a small community, said:

"We're hoping that we can direct council to understand that infrastructure, even though they can't see it, is in a bad way. We won communities in boom last year, we have a million flowers - the town looks great. At the end of the day, that doesn't supply a person with clean safe drinking water and doesn't supply

the river with clean effluent water. But people don't see that and that's a big challenge and trying to direct your council to understand as well.”

Collective action and participation. Collaboration had the sixth largest number of participants and was the sixth most discussed topic (see Appendix F). Twelve of the twenty-six participants spoke of a positive capacity for collaboration and five of a negative capacity. All participants either participate in collaborative processes around water governance or are responsible for hosting collaborative processes. In other words, collaboration is the key method to achieving governance and outcomes in Alberta. As Colin R., from a government mandated partner, stated:

“Our strength is our process and is our consensus, our multi-stakeholder process and so we have a process so when we identify a provincial level issue, we have all the right players around the table to look at it and work through to make the best possible recommendations based on bringing all those perspectives to the table and so our communication is out there and it's to the benefit of Albertans but it's not a direct line to Albertans.”

Lance P., from a local government, asserted that the collaborative process, through the WPACs, is the main way the community has to be heard and to influence water policy, management, and direction. He said that several staff are involved in the processes and although it can be time consuming, it also produces results. Jerry R., an agricultural industry expert, said that although it can be tedious and can be as frustrating as rewarding, it is better than the alternative, which would be the court system. Patrick W., a water expert, pointed out that in a collaborative process that is working well, everyone realizes they have something to lose and are often more willing to come together to ensure the end result will work for everyone.

It should be pointed out that although collaboration is a process, it is also an attitude. As Max L., of a WPAC, stated:

“If the people are saying, “Well this is a very serious issue, a challenge for sure and if those guys over there do this and those guys over there do that and those guys over there do something else, we could address this issue.” If I hear that kind of talk, then I am not in a collaborative atmosphere and the group I am looking at, if I hear lots of that talk, that is not a collaboration. If I walk in the room and I hear people say, “This is a very serious issue, a substantial challenge and this is what I can do to help address it,” or we if they are addressing an agency. This is what we can do, then there is fertile ground for a collaboration.”

He pointed out that "for true collaborations to take place there has to be an abundance of trust in the room amongst all of the stakeholders." That trust comes from ensuring that there is a willingness to listen, understand, and embrace the opinions of others—even when there is disagreement with that opinion.

While collaboration is the key method for achieving governance and outcomes, it is not without problems. The five participants who spoke of a negative capacity, were questioning the efficiency and the effectiveness of the process and the participants. As Lance P., from a local government, suggested, it is time consuming and there are times when "there is nothing more efficient than a benevolent dictatorship and sometimes it appears that the desire to be democratic about all the policymaking and regulations creates a drain on the capacity that is there." This is reiterated by Andrew R., a water expert, who not only saw the collaborative process of WPACs as inefficient but also as a place where:

“A lot of interests participate in those to make sure that they know what's happening so that they can protect their interests. So that they know what the movements are, and they can either assiduously assert their view at critical times in the discussion and make sure it doesn't get away on them, or to develop public relation strategies around these things. To make sure that nothing serious happens.”

Grant K., a water expert, also wondered if all of the participants were there to actually find a result that worked for everyone. He asserted that some groups are on the extremes

where they have a mandate to fight either the conservation or consumption of a resource. As the outcomes of collaboration usually involves everyone giving up a little in order to achieve something that works for everyone, this would cause some groups to be in disagreement with their mandates and possibly their funders. He also suggested that most collaborative processes in water governance work best when the provincial government is not the host. He argued that they host a very controlled conversation in order to receive the most information in the shortest amount of time. This causes a situation that sees people respond only to the questions asked, and the questions asked are not always the ones that should have been.

Accessing expertise was one area that was seen as both having a lack of capacity and an opportunity to build capacity in the collaborative processes. The provincial government is able to support the WPACs in providing the experts that they cannot afford to have on staff. Andrew C., from a provincial government department, said much of what they provide is:

“A large part of it is the hydrology perspective so just the ability to provide the data needed for what kind of water, what their watershed is like, from stream flows, lake levels, and then also water quality components or the limnology specialist, the water quality specialist. We do provide a significant amount of I think what we called the academic subject matter expertise. I believe at this point it’s not just a big role but it’s an important role because many of the WPACs don’t have outside of the industry partners and maybe if you’re the municipality partners they don’t have that kind of subject matter expertise at hand available all the time. That’s one of the things we bring in very regular.”

Other groups find that the lack of experts in their own organizations creates an opportunity to collaborate with other groups. As Jerry R., an agricultural industry expert, stated "We do not have in-house technical expertise, we do not do a lot of technical work, and so what we have to do is collaborative work when needed." Four participants

suggested that capacity needs to be build provincially in development of and access to technical or highly skilled experts. Quinn S., a politician, suggested that funding needs to be provided for groups to pay experts to come out and give information on specific situations. His example was to provide funding to communities and organizations to bring in wetland experts to bring people up to speed on the new wetland policy and how it relates to their particular wetlands in the area. Both Quinn S. and Andrew R., a water expert, said the province needs people who are able to communicate the science behind water management and other research outcomes in a manner that the general public and decision-makers understand.

Building capacity in collaboration was discussed by several participants.

Conversations focused on how to build a better collaborative process. Grant K. suggested that the collaborative process focus first on what is wanted and next what that success might look like. He said that the final focus is on how to get those wants. The key is, he argued, to look at how to get the wants through the organizations and groups already at the table, rather than waiting for the government to give permission or provide the tools. In other words, look to the capacity of the groups —through their skills and resources— to fill the want and provide the outcome. Rick D. and Anthony H., both from local governments, suggested that collaborative space needs to be created for new initiatives. Rick D. suggested that when the government brings forward new ways of doing things — for example, the regionalization of water services— they need to ensure there is a collaborative system set up. Otherwise, he asserted, it becomes political and communities look inward and view change as a threat to their own resources and opportunities. Finally, Andrew R., a water expert, spoke of the need to shake up and expand the stakeholders

sitting at the table. He suggested that the same people turn up for the collaboration, the conferences, the workshops, etc. After enough time has passed people have learned to come to a middle ground and there is not as much debate and discussion. Hard questions are not asked of the process itself and who might be missing from being involved. He argued that this might mean we are becoming too insular to the way water governance is viewed and done.

Networking. Fourteen participants discussed networking. It had the seventh highest number of participants and was the eighth most discussed topic (see Appendix F). Thirteen of the fourteen participants discussed the topic positively and seven discussed the negative capacity of the topic. Those that discussed the positive capacity of networking were discussing the opportunities they and their organizations have for networking as well as the positive benefits that come from networking. No group or organization works completely independently. As Dylan G., from a LWSG, said, "If we are invited to an event, we participate; if we hold an event, we invite the whole water community." Other participants gave extensive lists of the groups they have worked and shared knowledge with over the years. As Richard K, from an NGO, put it, "it's wheels within wheels within wheels here" where networking between groups and across geographic scales is what makes water governance work. Indeed, the five that discussed negative aspects of networking all suggested that in some ways, there are too many opportunities. Isabelle S., from a LWSG, stated:

“Then probably about a year and a half ago we thought that or we recognized that there might be a need for what may be a more formal watershed group as we looked at stewardship in a broader sense. We started some meetings with that in mind. We brought together quite a large number of people from the community with a large number of backgrounds. But through that process we realized that, in fact, there was a lot of water-related things in this area of the province. Some

of which we weren't even very familiar with before we started it or once we started to do a little bit more digging, and that starting another formal group was maybe not the way to go.”

She said there were so many groups and so many opportunities to connect into the network that it was difficult for a small group to not only know about all the initiatives, but also to know about all of the other groups with a like-minded focus.

Individual values, attitudes, and behaviour had the ninth highest number of participants and was the ninth most discussed topic (see Appendix F). This topic was not discussed as necessarily having or not having capacity. This is because it was a discussion on personal values, beliefs, and the cultural meanings that people—in the abstract—have assigned to water. It is understood by the participants that these values, beliefs, and meanings are not always spoken of but, unlike other issues or resources to be managed, must be acknowledged and respected. As Grant K., a water expert, stated:

There's a couple things about water that are really important, I think, to the conversation. One, different from other natural resources for everybody in the province, water's personal. The fact that it's personal means it's also passionately emotional. People come to these issues with a great deal of passion and can easily become very exorcised in front of that. Then three, I think, the third part of that is that it's also that one thing that none of us can do without, and in most cases, there's no replacement for it.”

Besides discussion on the need to acknowledge that water is necessary, personal, and emotive, participants talked about attitudes towards water and water use or practices. Participants pointed out that attitudes are starting to shift in the province from a belief of abundance and high quality to one of growing awareness of the pressures placed on quantity and quality. Although this shift is happening, people are still not completely aware of their own personal impact on water. Three participants pointed out that residents of the province really do not pay the true value of water and this is a barrier to shifting

attitudes about water abundance. If citizens do not see the value of water, it is difficult to have the same citizens' support the mechanisms needed to manage and conserve water quality and quantity.

Motivation and trust were the last two attributes in social capital that were mentioned by participants. Quinn S., a politician, suggested that there is little encouragement in the government for risk taking. Richard K., from an NGO, asserted that this is due to the constant change and shakeups of government departments. The focus is concentrated on organizational restructuring rather than designing departments to be long-term core or purpose focused, especially at the management level. This leaves your frontline staff without support or long-term plans and the full responsibility to ensure our resources are managed. James A., from an NGO, suggested that motivation can be created by doing as little as ensuring recognition happens. He said his organization doesn't do anything to thank the board or to build relationships across the board though fun team building events. He said he hoped that with a new executive officer position that they will be able to start doing that. It has worked well to build motivation in other organizations he has been with.

Six participants noted that there is a lack of trust between certain groups of stakeholders and between certain groups of stakeholders and the government. This most notably comes from a perceived lack of utilizing the advice, plans, and input—asked for by the government itself—into the government's formal documents and processes. Grant K., Patrick W., water experts, and Isabelle S., from a LWSG, all suggested that the government needs to find ways to incorporate the work completed by the partnerships and to let the partnerships know when and how they have done that. As Isabelle S. stated:

“There’s great frustration on people’s parts right now, to keep going with environmental or conservation related activities, feeling that you are batting your head against a wall. There’s so much talk, so much time and effort put in to good intentions by a huge number of people that doesn’t seem to actually impact decisions when they’re finally made, despite the rhetoric of the government. It becomes very discouraging to keep people going.”

This leads to a lack of social license to accomplish or change things as there is distrust of motives and intent.

Discussion. It is not surprising that knowledge building and dissemination was the most discussed theme in social capacity. Nor is it surprising that it is seen in a positive capacity overall by all sectors except for local governments, which did not come to agreement either for or against having capacity (see Table 5.7). That local governments might not find positive capacity may be due to the difficulty of reaching all residents in their prospective communities. Local governments have to be sensitive to citizen perspective on their overall budgets and service provisions and might not have the freedom to focus on public education of water and environmental knowledge. When the data for knowledge building and dissemination is examined by region, Athabasca is the only watershed with an overall negative capacity. This could be due to the newness of its watershed planning and advisory council as well as a lack of local watershed stewardship groups in the region.

Provincial government documents show this is one area that has full support. In six key documents since the start of the *Water for Life* strategy, the words information, knowledge, research and education all appear in the top 100 of a query for the most used words over four letters (see Appendix G) (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012). It is even more apparent with the idea of knowledge building, education, and raising awareness as being not only included as short- to long-range goals for specific

concepts, actions, and outcomes but are viewed as key action items warranting discussion chapters on its own (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012).

This also matches the findings from the literature review that suggested education, outreach and knowledge building would be important capitals for the water governance structure to have. However, the literature suggested that knowledge building and dissemination is a capacity in human capital (Moore et al., 2006; Beckley et al., 2008; Robins, 2008b). The literature sees these practices as building the education and skills of individual people which in turn are used by the institution, organization or themselves to advance a situation. Yet when one examines what the stakeholders are actually saying, it can be seen that knowledge building and dissemination is actually about the collective or larger social group's knowledge, building that knowledge, and ensuring everyone gets access to that knowledge. Therefore it makes more sense to include knowledge building and dissemination as a social capital or capacity than strictly a human or individual capital or capacity.

Of the remaining topics collaboration, networking, values, attitudes, and behaviours, motivation, trust fit into five of nine themes found in the literature for social capital (see Table 5.7 below). Collaboration, or collective action and participation is second only to networks when looking at its importance in the literature. These two elements of capabilities are the drivers of social capital in that they are the actions that help build the trust, shape the attitudes, and reinforce the norms (Chaskin, 2001; Beckley et al., 2008; Floress et al., 2011).

Table 5.7: Social Capital by Sector

Social Capital										
Elements (n = number of mentions)										
Sector Type (n=total number interviewed)	Trust & Reciprocity	Values Attitudes & Behaviour	Commitment	Norms & Sanctions	Networks & Information Flows	Collective Action & Participation	Collective Association & Representation	Motivation	Knowledge	Sense of Place
Provincial Government (2)	-	-	-	-	DP (2)	DP (1) IN (1)	-	-	DP (4)	-
Government Mandated Partners (5)	DN (1)	IN (1)	-	-	DP (2)	DP (2) DN (1)	-	-	DP (5) DN (1)	-
NGOs & LWSGs (4)	DN (2)	IN (1)	-	-	DP (8) DN (3)	DP (5)	-	DP (2) DN (1) IN (1)	DP (6) DN (1)	-
Local Government (8)	-	IP (1) IN (4)	-	-	DP (3) DN (3) IN (2)	DP (4) DN (3) IN (1)	-	-	DP (4) DN (4)	-
Industry (1)	-	-	-	-	-	DP (1) IN (1)	-	-	DP (1)	-
Experts (6)	DN (4)	IP (2) IN (7)	-	-	DP (3) DN (1)	DP (4) DN (2)	-	DN (2)	DP (6) DN (1)	-
Totals	Negative =7	Positive = 3 Negative = 13	-	-	Positive = 18 Negative =9	Positive = 17 Negative = 9	-	Positive = 2 Negative = 4	Positive = 26 Negative = 7	-

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

In turn collaboration itself is shaped by conditions of trust, values, beliefs and attitudes, and commitment. This is made clear from the comments made by participants on how collaboration works within the water governance structure. That there were considerably more positive comments on the capacity for collaboration, and it was consistently positive across almost all sectors and all regions, is a strong indication of the expectation that the preferred method for managing and evolving water governance is through the collaborative process (see Table 5.7 and Table 5.8). The one exception to having agreement on the capacity of the collaborative process was from local governments. Stakeholders saw the time constraints and available staffing, as well as turnover in elected officials as barriers to fully achieving capacity.

Table 5.8: Social Capital by Region

Social Capital										
Elements (n = number of mentions)										
Region (n=total number interviewed)	Trust & Reciprocity	Values Attitudes & Behaviour	Commitment	Norms & Sanctions	Networks & Information Flows	Collective Action & Participation	Collective Association & Representation	Motivation	Knowledge	Sense of Place
Athabasca Watershed (4)	-	IP (1) IN (2)	-	-	DP (1) DN (1) IN (2)	DP (1)	-	-	DP (2) DN (3)	-
North Saskatchewan Watershed (5)	DN (1)	IN (3)	-	-	DP (4) DN (4)	DP (3) DN (2)	-	DP (1) IN (1)	DP (6) DN (1)	-
South Saskatchewan Watershed (5)	DN (1)	-	-	-	DP (2) DN (1)	DP (5) DN (2) IN (2)	-	-	DP (3) DN (2)	-
Province- Wide (12)	DN (5)	IP (2) IN (8)	-	-	DP (11) DN (1)	DP (8) DN (2) IN (1)	-	DP (1) DN (3)	DP (15) DN (1)	-
Totals	Negative = 7	Positive = 3 Negative = 13	-	-	Positive = 18 Negative = 9	Positive = 17 Negative = 9	-	Positive = 2 Negative = 4	Positive = 26 Negative = 7	-

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

Other stakeholders that held a negative perception of capacity on collaboration could see the positive aspects of the process but were concerned with the barriers that could arise in collaborative situations such as a lack of altruism and power differentials between those at the collaborative table. It was also brought up that the fact that the same people are consistently involved in the collaborative process across the regions and the province means that there is little new information or cross-fertilization of ideas that are needed to spur innovation. Barriers to networking were similar in that if a group is unaware of the opportunities and activities, they either miss out completely or come to the larger group at a disadvantage. Again, networking constraints included time, availability of staff or volunteers to participate, and finances to participate.

Topics of collective association and representation, and norms and sanctions are topics covered as being important to social capital in the literature but are not directly discussed

in the interviews. However it can be inferred from the conversations that these are actually important to water governance overall. For example, there are six key papers that stated that collective association and representation was important to social capital (Chaskin, 2001; Pretty & Ward, 2001; de Loë et al., 2002; Moore et al., 2006; Robins, 2008b; Floress et al., 2011). That all citizens are represented and have the opportunity to participate in activities that determine or impact on their own personal outcomes is a democratic function (Chaskin, 2001). It can be argued that citizens are not only passively represented through their local and provincial elected officials but they also have the ability to self-represent by joining one of the established WPACs, NGOs, and local watershed stewardship groups or by starting their own.

Norms and sanctions were also seen as important (Pretty & Ward, 2001; Adger, 2003; Pretty, 2003; Beckley et al., 2008). Again, this topic was not directly discussed by the participants. Norms and sanctions are created collectively by the group and by society at large. This should be seen in the collaborative process found in Alberta's water governance structure as each partner negotiates at the collective table. Censure would come from other stakeholders for transgressions made by a stakeholder or from the citizens of the province through rejection of a plan, project, etc. made by a collective group. To better capture these topics a different type of data collection tool is required or a research project that focused specifically on the collaborative process.

Commitment and sense of place were another two elements of capabilities that did not directly show up in conversations with the participants. These two elements had fewer key papers to support their inclusions as part of social capital. Commitment was included in three frameworks for capacity (de Loë et al., 2002; Moore et al., 2006; Robins, 2008b)

and sense of place was included in two frameworks (Moore et al., 2006; Robins, 2008b). It is possible that the questions asked of the participants were not designed in a way that allowed for the direct capture of these two concepts. This differs from the element of motivation, which was only supported by one key paper (Robins, 2008b), but had a response from several participants (see Tables 5.7 and 5.8).

Provincial government documents show that making use of social capital is an area that has full support. In six key documents since the start of the *Water for Life* strategy, the words such as councils, advisory, partnerships, groups, partners, and stakeholders all appear in the top 100 of a query for the most used words over four letters (see Appendix J) (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012). This is reinforced when realizing that the government's method for managing water included public consultation during the planning and creation of the *Water for Life* strategy (Alberta Environment, 2002). One core principle is the idea that all Albertans are responsible for water management and must "work together to improve conditions within their local watershed" (Alberta Environment, 2002). The idea of working together—or collaboration—was so fundamental to the concept that a document was created outlining the key methods for collaboration through partnerships and chapters are included in each document for partnerships and the purpose and/or state of the goals of having partnerships (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012).

Key findings. There are six key findings from the data that relate to social capital. The first is that there were only five elements of social capital discussed by participants. These were 1) collective action and participation, 2) networking and information flows, 3) individual values, attitudes, and behaviours, 4) motivation, and 5) trust. The second

key finding is that a new element, knowledge building and dissemination, needs to be added as a new element to social capital. The third key finding is that the majority of comments about knowledge building and dissemination, networks and information flows, and collective action and participation were positive. The fourth key finding is that all of the comments about trust were negative. These comments were about the trust between the stakeholders and the provincial government. The fifth key finding is that the majority of comments about individual values, attitudes, and behaviours, and motivation were negative. The sixth key finding is that the literature on social capacity partially matches the experiences and perspectives of the participants.

5.6 Institutional Capital Capacity

Four nodes relating to institutional capital were found in conversations with the stakeholders. These were 1) governance development, 2) technology and communication tools, 3) organizational development, and 4) volunteer management. Governance development had twenty participants who spoke on the topic. Technology and communications had seventeen participants and organizational development had twelve participants. There were nine participants who spoke on volunteer management.

Governance development had the third largest number of participants discussing it in conversation and it came up as the most discussed topic in all of the interviews (see Appendix F). The conversations around governance development was specifically about the overarching water governance strategy and the provincial government's abilities and attitudes in this area. Out of the twenty participants discussing the topic, most spoke about roles and responsibilities, policy planning and outcomes, and proactive vs. reactive thinking and/or action patterns. These link to the elements of capacity through inter-organizational relationships, rules and incentives, institutional culture, and management practices.

The conversation around roles and responsibilities had a marked division between understanding the internal role of each group, sector or department but not understanding the expectations placed on each by the provincial government itself. In other words, the individuals, organizations, groups, etc. working in water governance are clear about what they are doing and why they are doing it but they are not so clear on the expectations of and purpose of project outcomes from the provincial government. Participants from organizations and groups not directly tied to the government were clear that the partnership approach was not hierarchical in the sense that information could be passed up to the decision-makers through the partnerships and then have that information acted upon. Rather they were very aware that their roles were to provide advice that may or may not be acted upon by the government and to do the day-to-day work of cleaning, repairing, and in some cases, planning and monitoring of the watersheds. The day-to-day operations are understood and accepted. There is frustration over the advisory role and the expectations and outcomes.

This is made clear by Isabelle S., from a LWSG, who stated:

“...we are, as a conservation group attempting to educate in our community, in our area and broaden people’s views of how they should use and preserve that nature around us, not only in our community, but in this geographic area. Part of that, I think what we feel is making some choices on how the land is used, and not used. We’re not seeing that, actually translated into action in this draft plan right now. Again, you think, “Well, why would you keep educating people if they’re still going to be allowed to go up there and do whatever they want?” In this free-for-all that we see in this area, why would the government tell us that they are preserving land and then they show us a map and all it is the tops of the mountains and say, “Look, we’re going to put a park in there.” But it’s on the area that people can’t get to anyway and down at the bottom where they can get to, they’ll still be allowed to do whatever they want to do. “

This sense of not being heard in the advisory process is reiterated by Grant K., a water expert, who said,

“The other thing that needs to be there is that for stakeholders to really do this over the long term, they have to know that somebody's going to listen to them. I think what we've had in Alberta at times and even with this last water conversation is people have gone very earnestly and sincerely and given their opinions. When they see the report that comes out from the government they may not be able to find their opinion anywhere. They won't feel they've been heard.”

Three participants, Quinn S., a politician, Grant K., a water expert, and Randy D., from a WPAC, suggested that one way to build capacity and remove some of the frustration of not being heard by the provincial government, is to give the WPACs more authority. Participants mentioned both the Ontario approach to watershed management as well as the Netherlands approach. Both systems allow the watershed council the ability to make decisions and tax locally for improvements to the watershed. However, not all participants agreed this would be a good thing to do.

Grace C., from a WPAC, pointed out that a WPAC —not one that had been interviewed for this project— had recently been hijacked by vested interests. She argued that there are two reasons that the current WPAC model cannot and should not be made authoritative. The first reason is the WPAC is a voluntary process. People on a WPAC board are not democratically elected by the population of the area in which the WPAC serves. Nor are communities in the WPACs sphere of influence required to become members, even though many do participate. The second reason is that there tends to be a split in the membership between those that are paid by their employers to be there and those that are not. This gives an unfair advantage to specific sectors as the pay can enforce a voting pattern in favor of those doing the paying. It also ensures that specific sectors are always represented as it is part of someone's job description, unlike those sectors that rely on volunteers and who might not be able to pay an honorarium to cover a

volunteer's expenses or time. Andrew C., from a government department, asserted that the government tries to find a balance between the advice that the WPACs give and the overall needs of the province as a whole. He states:

“We struggled with it all the time because we don't want to dismiss the real needs and the geographical knowledge of the people who are participating in a WPAC and after they come up with what they think is a great idea and they say, “Oh, no, we can't do it because it's provincially not a good idea.” I don't think we're trying to get to that. I think what we're trying to get to is we're trying to see if there's a way to still maybe get a resolution to their issue that could still somehow fit within a provincial, overarching provincial perspective.”

It is suggested by some participants that this process is actually the real issue due in part to the way the *Water for Life* strategy is planned out. As Richard K., from an NGO, pointed out:

“No one is putting together a coherent, comprehensive strategy such as [name of plan] for the region as whole, but everyone's working the problem at multiple levels. And the resources that were out there are extraordinary, so it's the ability to pull it all together to see what's complementary, what's not, where can we agree, where are the holes, what does a coordinated program actually look like and the empowerment to do so, the willingness to do so; and agencies are extremely sensitive about that.”

He argued that if the government is going to set outcomes, then they need to be outcomes that can be met and that have the societal license to support the process in achieving those outcomes. Grant K., a water expert, suggested that the strategy is more on creating the governance mechanism without knowing what solutions there might be, which leads to:

“...what you end up doing is potentially creating squares which pegs have to be fit. People then start to focus the solutions on how you fit into the governance framework instead of figuring out what the range of solutions are, what the sustainability of the solutions are, and then designing a very specific governance mechanism to support. We've got it backwards.”

He asserted that we do not focus enough on the outcomes and spend all our time on finding the perfect structure. He stated:

“It's almost irrespective of objectives, which is what I think in Alberta, we tend to go round and round and round is because there isn't, at least in my view, there's not a clear line of sight from a certain type of governance mechanism to the outcomes we want to achieve and this will help us get there.”

Richard K., from an NGO, also argued that the very culture of the government institution creates a reactionary rather than a strategic thinking pattern. He stated:

“We see these big societal changes occur, but in organizations, it's always snakes and ladders. You'll almost get to the end of the game and you're in a really progressive place, and then you step on the snake's head and you go right back to the beginning and you do it again and again and again and again, and it doesn't seem to grow in the same way. We talk a great fight, but institutional cultures and traditional power authorities and an inability to think really strategically, but an ability to respond to immediate stimuli, usually crisis where you've already put yourself into a corner where there's no easy solution because you've ignored it for so long, is the reality that you deal with.”

Kent J., a water expert, agreed. He argued this was apparent in the conversations after the floods. He said:

“...the flood of this year is a classic example of the Alberta response. We got the wild west gunslinger that's going to respond by, "We'll fix it. We're going to build something." Wait a minute. That's not the only response. In that particular one you have two options. We can keep water away from people, or you can keep people away from the water. Really you need to do both. You need to do both. And the gunslinger response is wrong.”

Participants had few suggestions on how to build capacity in governance development other than advancing the authority of WPACs as discussed above. One suggestion was creating a framework of permissions or innovations that would give WPACs and other groups, as well as local governments a clear direction on when they can go ahead with implementing some types of projects. For example, some communities have been looking at implementing purple water (reclaimed) systems. The province does not have any legislation or strategy around this and there is little in the current frameworks that allow new and innovative ideas to be tested and tried. The framework of permissions or

innovations should also include encouragement for stakeholders to participate freely and provide clear examples of how and when the government will support workable solutions agreed upon during stakeholder driven projects.

Technology and communications was one area in institutional capital where participants see their organizations as having considerable capacity. Communication and technology tools had the fifth largest number of participants discussing it in conversation and it came up as the second most discussed topic in all of the interviews (see Appendix F). In addition to accessing traditional methods of communication —newspapers, pamphlets, booklets, and brochures— all twenty organizations represented by stakeholders have a web presence through a dedicated web page and all but four of those are making use of social media platforms such as a blog, Twitter and/or Facebook. Out of the six participants who were not linked to a specific type of organization, five hold a web presence through some form of social media. One participant, Isabelle, from a LWSG, said their organization was able to receive funding to revamp and update their web site. She suggested "[t]hat's a challenge for volunteer groups to have consistency" but they themselves have a volunteer who handles both their web site and their newsletters. Even the traditional communication strategies often reach a wider audience than members of each organization. For example, in Max's organization, a WPAC,

"When we send stuff out, we pretty continuously encourage our membership, if they are inclined to do so, to give it broader distribution. We have no way of knowing just how much of that takes place and we certainly never invited members to report on that but we, I think we can reasonably assume that it does get a broader distribution than the two hundred and fifty odd members that we send things out to directly."

This is reiterated by Isabelle, whose organization sends out an e-newsletter to approximately 300 people, many more than the total membership.

Technology —most often discussed as GIS and models that have a hands-on visual component— were seen as a capacity-builder. Max L., from a WPAC, and Telan S., from a government mandated partner, said that having access to the data from models and sensors for water flow and levels have made decision-making easier. This is due to the real-time aspect of the data and due to the accuracy of the data. Patrick W., a water expert, said that with the better accuracy in the data, it is easier to model the what-ifs and have a more accurate understanding of the outcomes.

Where there are concerns about technology is in what Max L. states as overselling. He said: "What comes to mind are the latest greatest web based tools; people who deal with information technology all the time. They innocently tend to oversell the tools and the practitioners tend to find that the tools that are in hand are underperforming." Also a concern is the support for data collection and monitoring systems. Without adequate funding, technical support and expansion there will be delays and inaccurate analysis of events. As Andrew R., a water expert, said "You got to have tools. You got to have good models. You got to have good linkages between hydrological and meteorological models that are available to us." This, he asserted, is what is needed to take full advantage of the benefits that technology can offer.

Participants suggested that areas to build capacity in communications and technology lie with the creation of better, more flexible and publicly accessible water models. Grant K. suggested that better facilitation between groups to ensure the data going into the models are as accurate as current knowledge can make and that benchmarks and protocols are created to ensure greater relevancy, accuracy, and access are embedded in the process. Patrick W. suggested that the other capacity-building aspect required is better valuation of environment

and emotive non-tangible connections to the environment. He asserted that if you are unable to place a value, then the current format of models will not include a large and important piece of the holistic picture of our world.

Organizational development had the eighth largest number of participants discussing it and came up as the seventh most discussed topic in all of the interviews (see Appendix F). The conversations around organizational development were specifically about the non-profit groups, departments, and local governments and their own individual institutional capacities. Out of the twelve participants discussing the topic, most spoke about time and effort expended, succession planning, internal policy development, and liability awareness. These are linked to management practices, political influence, rules and incentives, and institutional culture. Time, energy, and effort spent on administrative work was the biggest concern from the participants who spoke on organizational development. As Isabelle S., from a LWSG, stated "It's a heavy load. The administrative side of it is a heavy load on a very few number of people. It can be difficult to attract enough volunteers or to attract people that will take over that load to keep it going." James A., from a NGO, pointed out that now that they have an executive director the administrative load on the board has been reduced but the work still needs to be done. He figured that approximately 80% of the organization's work was administrative paperwork with 20% of the organization's time spent on actual program or mandate work.

The concern over time, energy, and effort spent on administrative work was found in more sectors than just local watershed stewardship groups or provincially operating non-governmental organizations. Max L., from a WPAC, suggested that the time and energy needed to be invested in a new project or opportunity—even if the project or opportunity

will increase the organization's capacity— can be so substantial during the initial phase that it puts a halt to the project. As he said:

"Sometimes that's problematic and perhaps even self-defeating because people don't have the time to actually invest the energy to get to that point that's maybe two or three, four weeks down the road or six months down the road where the new found capacity is now realized and fully productive. It took more energy and effort to get there than you could afford to expend at the time."

Even municipalities can find the administrative load difficult. Anthony H., from a local government, figured that the workload just to administer the entire grant process — application, interim reporting, and final reporting— for all their active grants was the equivalent of a full time position. He argued "I know there has to be a level of oversight. I understand all of that but it needs to be at a level that's reasonable for the work that's being done."

Internal policy development was discussed by two participants. One, Max L., pointed out the need for updating or creating policy as it is needed. He said that "the more you can develop the backbone of policy and procedure, the better you are able to concentrate on the projects at hand." A lack of policy can take valuable time and resources away at the expense of the current project. James A. agreed that a lack of policy development can take up time better spent elsewhere. He pointed out that if the board has to discuss the procedure every single time a reoccurring event happens —such as determining selection for attendance at a conference— then time spent on higher priority issues is lost. This internal policy development directly relates to an organization's understanding of liability and to an organization's succession planning. While two participants, Dale H., from a local government, and Patrick W., a water expert, did say their organizations have a succession plan, other participants stated that they did not. Bryan N., from a local government,

suggested that a population moving towards retirement, combined with difficulty attracting workers to the water and wastewater operators profession, means it is difficult to tie succession planning to key individuals and their positions. This causes succession planning to be pushed to the side over attempts to stabilize and grow the workforce. Richard K., from an NGO, pointed out that with constant restructuring of provincial government departments, there is little opportunity for them or other organizations to plan for succession. He wondered if creating permanent core functions similar to the American services (United States National Park Service, United States Fish and Wildlife Services, etc.), some of which have been in existence for over a hundred years, would allow for long-term planning. James A., from an NGO, pointed out that it is difficult for local watershed stewardship groups, NGOs, and WPACs to plan for more than a year due to the way funding is handled. He asserted that when funding is precarious, there is no point in planning beyond the year.

As James A. pointed out, there is a lack of understanding of the liability that an organization has. This can see an organization purchasing insurance that they might not need, based on the advice of those selling the insurance. Grant K., a water expert, suggested that not understanding liability of ownership, along with a lack of funding, can lead to small communities creating adverse situations due to lack of funding and/or training. He asserted that the regionalization of water services needs to assuage the fears of small communities that they are losing control over their infrastructure. Lauren C. suggested that the decisions made by other municipalities can impact the liability of other communities. In her example, a subdivision was approved by one local government however the water was provided by another and they did not have the capacity to meet the needs for safety. The subdivision plan was approved by the first local government even though they had been told of the lack of

capacity. There needs to be a mechanism in place to allow for resolving those types of issues before subdivision plans are approved.

Management of volunteers was the topic that had the tenth largest number of participants discussing it in conversation and it came up as the tenth most discussed topic in all of the interviews (see Table Appendix F). The conversations around management of volunteers was strictly around the actual day-to-day management from an institutional perspective rather than from developing staff and volunteers in a human capacity perspective. Nine participants spoke on this topic, which is linked to human resources development (see Table 5.9 below). A person interested in water and looking for volunteer opportunities has plenty of choice. As Grant K., a water expert, stated:

“It's easy to get engaged. There's lots of opportunities, whether it's in a very local area with a watershed stewardship group. Whether it's a basin or sub-basin level through one of the watershed planning advisory councils. Whether you are in an industry that is highly reliant on water; there's lots of ways to get engaged.”

He also said that a volunteer's opportunities are shaped by their perspective on water and water issues. Andrew C., from a government department, suggested that this can impede the governance process, especially when one voice or even one sector is dominant at the table. However, as Randy D., from a WPAC, pointed out, there is great potential in the volunteers that are working in water conservation and governance. Max L. states that without volunteers, there would be limited success for his WPAC. Volunteers are engaged in every type of task from sitting on boards to short one-day projects like weed pulls to working on portions of management plans. The means to keeping volunteers engaged varied, but those that discussed retention and engagement all mentioned providing tasks and projects of manageable portions (both duration and size) and ensuring that there is a feeling of enjoyment and accomplishment during the tasks or

projects.

Discussion. The topics of governance development, communication and technology tools, organizational development, and volunteer management fit into all nine themes found in the literature for institutional capital (see Table 5.9 below).

Table 5.9: Institutional Capital by Sector

Institutional Capital									
Elements (n = number of mentions)									
Sector Type (n=total number interviewed)	Human Resource Dev.	Inter- Organizational Relationships	Communication and Information Sharing	Rules & Incentives	Technical	Institutional Culture	Representation & Public Involvement	Political Influence	Management Practices & Procedures
Provincial Government (2)	DP (1) DN (2)	DP (2)	DP (1) DN (1)	-	DP (2)	-	-	-	DP (2)
Government Mandated Partners (5)	DP (5)	DP (3) DN (9)	DP (5) IN (1)	DN (1)	DP (2) DN (2)	DN (3)	-	DP (2) DN (1)	DP (1) DN (4)
NGOs & LWSGs (4)	DP (1)	DP (1) DN (4)	DP (3) DN (2)	DN (7)	-	-	-	DP (1) DN (1)	DP (3) DN (6)
Local Government (8)	DP (1)	DP (2) DN (4)	DP (6) DN (1)	DP (3) DN (6)	DP (1) DN (2)	-	-	-	DP (3) DN (2)
Industry (1)	DP (1)		DP (1)		DP (1) DN (1)	-	-	-	-
Experts (6)	DP (3) DN (1)	DP (2) DN (7)	DP (3) DN (1)	DP (2) DN (6)	DP (3) DN (2)	DN (5)	DN (2)	DP (3) DN (3)	DN (2)
Totals	Pos. = 12 Neg. = 3	Pos. = 10 Neg. = 24	Pos. = 19 Neg. = 6	Pos = 5 Neg = 20	Pos. = 9 Neg. = 7	Neg = 8	Neg =2	Pos. = 6 Neg. = 5	Pos = 9 Neg =14

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

It should be noted that for this project, governance development and organizational development were discussed as distinct aspects of the governance structure, but have their attributes counted under the elements of capabilities found in institutional capital. These include institutional culture; representation and public involvement; political influence; and rules and incentives.

When the data is examined by sector and by region, it is clear that there are some elements that are seen as having a more positive capacity by the participants. These are

human resource development; communication and information flows; technical; and political influence (see Table 5.9 above and 5.10 below).

Table 5.10: Institutional Capital by Region

Institutional Capital									
Elements (n = number of mentions)									
Region (n=total number interviewed)	Human Resource Dev.	Inter-Organizational Relationships	Communication and Information Sharing	Rules & Incentives	Technical	Institutional Culture	Representation & Public Involvement	Political Influence	Management Practices & Procedures
Athabasca Watershed (4)	-	DN (3)	DP (1)	DP (1) DN (4)	-	-	-	-	DP (2) DN (1)
North Saskatchewan Watershed (5)	DP (2)	DP (2) DN (7)	DP (5) DN (1) IN (1)	DP (2) DN (4)	DN (3)	-	-	DP (1) DN (1)	DP (1) DN (3)
South Saskatchewan Watershed (5)	DP (5)	DP (1) DN (2)	DP (5) DN (1)	DN (1)	DP (3) DN (2)	-	-	DN (1)	DP (1) DN (5)
Province-Wide (12)	DP (5) DN (3)	DP (7) DN (12)	DP (8) DN (3)	DP (2) DN (11)	DP (6) DN (2)	DN (8)	DN (2)	DP (5) DN (3)	DP (5) DN (5)
Totals	Pos. =12 Neg. = 3	Pos.=10 Neg.=24	Pos. = 19 Neg. = 6	Pos = 5 Neg = 20	Pos. = 9 Neg. = 7	Neg = 8	Neg = 2	Pos. = 6 Neg. = 5	Pos =9 Neg = 14

DP=direct mention, positive DN=direct mention, negative IP= indirect mention, positive IN=indirect mention, negative "-"=not discussed

The Athabasca watershed did not have any stakeholders speak to human resource development, technical, or political influence. This may be due to the newness of the WPAC and a more sparse population in general. Those elements that were seen as having a negative capacity are management practices and procedures, representation and public involvement, institutional culture, rules and incentives and inter-organizational relationships. Other than institutional culture and representation and public involvement, all were discussed across all regions (see Table 5.9 above). Institutional culture as well as representation and public involvement were seen as a negative capacity by experts. These participants were not linked to a specific region and were perhaps able to see a broader picture than those rooted in a specific location.

In the literature, topic of rules and incentives is considered as being important to

institutional capital by all but one key paper (Cosío, 1998; de Loë et al., 2002; Ivey et al., 2006; Moore et al., 2006; Brown, 2008; Robins, 2008b; Van de Meene et al., 2009). This topic ranges in the comments from participants discussing building capacity through creating frameworks of permissions and innovations to suggestions of increasing the authority of WPACs to issues with a lack of enforcement of regulations. It also covers policy at the organizational level.

Political influence was seen as having a positive capacity by experts, NGOs and LWSGs, and by government-mandated partners in all regions but Athabasca. However, the literature did not place as much importance on this topic, except for one key paper (Chaskin, 2001). It appears that this is one element that is more important to the Alberta water governance structure than the literature implies. The literature shows that institutional culture and representation and public involvement has limited support for their inclusion in institutional capital, with one key paper (Brown, 2008) and three key papers respectively discussing it (de Loë et al., 2002; Brown, 2008; Van de Meene et al., 2009). This is reflected in the results which sees only experts and those with strong government connections discussing these topics.

With the first look at the data, inter-organizational relationships seems to have a negative capacity. However, when looking at each piece of data, it is apparent that the negative capacity is seen in the relationship between the organizations and the government or the relationship between each government department. The positive capacity comments are directed at the relationships each organization has with other organizations also working in water governance. Overall, institutional capacity is lacking in areas important for governance development and in organizational development but is

present in communication and technology tools and in volunteer management.

The conversations around governance development is concerning due to the perceived attitude and behaviours of the government towards those types of organizations that are seen as partners in water governance (Alberta Environment, 2005). Two key areas are impeding the progress of watershed governance and the building of meaningful partnerships. The first of these are that the requests by the government for advice, annual updates and reports, and watershed management plans are either ignored outright or are accepted/followed in a manner that is unrecognizable. The second is the difficulties some partners have in securing access to funding and resources as discussed in the economic capitals section.

The documents produced by the government in regards to watershed governance all clearly state that the preferred method for meeting the goals as outlined in the *Water for Life* strategy is through the work of all Alberta citizens (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012). This is stated to be done through individual contributions, effort from all local government and non-profit water partners, as well as the business sector. Indeed, the list of top 100 words over three letters in all six documents includes words such as Albertans, public, partnerships, partners, stakeholders, groups, and councils (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012). The actions tell a different story.

The literature shows that when partnerships have power imbalances there are problems around legitimacy, trust, information networks, and accomplishing goals (Scholz & Stiftel, 2005; Trachtenberg & Focht, 2005; Wilson & Wiber, 2009; Munoz-Erickson et al., 2010). Research has also shown that the government can continue to maintain full control while achieving their desired outcomes and still have positive, strong, and healthy partnerships (A. R. Davies, 2002; Focht & Trachtenberg, 2005; van Buuren, Buijs, & Slob, 2010; Lee, 2011).

While communication tools are a component of institutional capital, they are not mentioned as a focus point in any of the government documents (Alberta Environment, 1999, 2002, 2005, 2008, 2009, 2012). This could be explained by the concept that Morgan (2006) put forward that capacity is functional and much of what we call capacity (or capitals) is actually the mechanisms or structures that allow us to access capacity. While those also need to be built much like capacity, the mechanisms in and of themselves do not constitute capacity (Morgan, 2006). In other words, communication tools are a mechanism that allows us to build or access X, Y, and Z capacity.

Organizational development is an important feature of institutional capital. The literature shows that the capacity of an organization to make appropriate decisions and have the resources in order to meet or implement its mandate is critical to the success of the desired outcomes (Ivey et al., 2002; Ivey et al., 2004; Brown, 2008; van de Meene, Brown, & Farrelly, 2010). This embraces the idea that rules and regulations, along with human resource development, institutional culture, and management practices and procedures are the components that move organizational development forward (Ivey, De Loë, & Kreutzwiser, 2002; Ivey, Smithers, de Loe, & Kreutzwiser, 2004; Brown, 2008; van de Meene, Brown, & Farrelly, 2010). However, Morgan (2006) put forward a functional concept called the capacity to act, which provides a deeper understanding of all that is needed for an organization to act. He argued that the capability to act blends attributes of motivation, commitment, values, attitudes and beliefs from social capital, liquid assets from economic capital, leadership from human capital, and human resources development from institutional capital, as well as space, confidence, security (operational autonomy), and

identity (Morgan, 2006). This cross-capital blend is a more realistic view of what is needed in order to achieve the mandates, goals, and objectives.

A review of the provincial documents around water governance show that little attention is placed on the functionality of or the resources needed to function for almost all stakeholders. The *Enabling partnerships: A framework in support of Water for Life, Alberta's strategy for sustainability* document does outline what a good partner does for each of the partner types (the Alberta Water Council, the WPACs, and local watershed stewardship groups) (Alberta Environment, 2005). That being said, there are other resources from other provincial departments—notably Alberta Culture's Non-profit/Voluntary Sector Initiative—that can and have aided water organizations.

Volunteer management is a part of the human resources development element in institutional capital. While the burn-out issue discussed in the human capital section is due to attracting and retaining the volunteers, participants have said there is capacity in their actual management of volunteers. This can be explained by the fact that those that discussed burnout in volunteers were from organizations that had no paid staff to ease the administrative work load. Although researchers have said that human resource development is an element in institutional capital, the capacity to act as put forth by Morgan (2006) better encompasses the complexity around institutional capacity generally as well as human resources development specifically. The government documents do not speak to managing volunteers due, in part, to being considered to be an organizational issue rather than a provincial issue.

Key findings. There are six key findings from the data that relate to institutional capital. The first is that all nine elements of institutional capital were discussed by participants. The

second key finding is that the majority of the comments about human resources development; communication and information sharing; technical; and political influence were positive. The third key finding is that the majority of comments about rules and incentives; institutional culture; representation and public involvement; and management practices and procedures were negative. The fourth key finding is that the when taken as a whole, the majority of the comments made about inter-organizational relationships were negative but when divided into types only negative with the government and between government departments. The sixth key finding is that the literature on institutional capacity partially matches the experiences and perspectives of the participants.

5.7 Conclusion

This chapter has presented the findings and discussion from the interviews and the government documents. It is shown that there are positive areas of capacity, areas where capacity is undetermined or indirect, and areas in which there is a negative perception of capacity (see Table 5.1 to 5.10 above). Areas with strong capacity include the social capitals of knowledge building and dissemination; collaboration; and networks and information flows. Strong capacity is also seen in institutional capitals of human resource development and communication and technology tools. Areas with strong capacity-building needs include all elements of economic capacity as well as institutional capitals of inter-organizational relationships and organizational development (especially management practices and procedures).

Although the data were sorted by sector and by region, it was not directly apparent where there were differences in capacities. Due to the small sample size, a map of the locations of each interview is not possible as it would potentially reveal the identity of the participants.

However, it would show that those participants working in an organization or community that was further away from a large centre (population) and/or located in an area with less affluence (political or financial) and/or located in an area where focus on water and water governance is relatively new tend to have more negative capacity. This is why no one sector had complete capacity. In other words, the participants based in or near large municipalities—while not necessarily having full capacity at all times in all capitals—discussed all aspects of capacity with greater positivity than those based in smaller, more remote communities.

It was also shown that some elements of capabilities under the capitals were not important to the participants or had stronger linkages with a different grouping. For example, under economic capital participants did not mention access to markets. Another change was moving indigenous and local knowledge to social capitals as this element is seen as a collective or social aspect rather than an individual one. Table 5.11 provides the suggested elements of capabilities in the capitals that are important to stakeholders in Alberta's water governance structure. Elements that are identified with a 1 once are elements that were identified in both in the literature and in the findings. Elements identified with a 2 are elements that were identified in the literature but not in the findings. Elements identified with a 3 are identified in the findings but not in the literature.

The next chapter will discuss the implications of the results as well as provide information on future research directions. It will also include information on where the research design could have been improved.

Table 5.11: Suggested Elements of Capabilities in the Capitals

Natural Capital	Economic Capital	Human Capital	Social Capital	Institutional Capital
Ecosystem Services ¹	Public Infrastructure ¹	Education	Trust & Reciprocity ¹	Human Resources Development ¹
Extractable Natural Resources ²	Government Budget & Cash Flows ¹	Job Experience ¹	Values, Attitudes, & Behaviours ¹	Inter-Organizational Relationships ¹
Income/ Jobs from Resource Extraction ²	Diversity to Community Cash Streams ¹	Life Experience & Acquired Skills ¹	Commitment ¹	Communication & Information Sharing ¹
Appreciation of / Access to Nature ¹	Access to Markets ²	Individual Health ¹	Norms & Sanctions ²	Rules & Incentives ¹
	Resilience to Market Fluctuation ¹	Entrepreneurship ²	Networks & Information Flows ¹	Technical ¹
	Grassroots Access to Grants ¹	Leadership ¹	Collective Action & Participation ¹	Institutional Culture ¹
	Transparency & Accounting ¹	Indigenous & Local Knowledge ²	Collective Representation & Association ²	Representation & Public Involvement ¹
	Harvested Resources ¹	Willingness to Participate ²	Motivation ¹	Political Influence ¹
		Diversity ²	Sense of Place ²	Management Practices and Procedures ¹
		Human Resource Development ³	Indigenous & Local Knowledge ³	

1 = found in literature and findings; 2 = found in literature only; 3 = found in findings only

6. Conclusion

6.1 Introduction

This chapter concludes the thesis. The objective is to summarize the findings, consider selected implications of the findings, and suggest avenues to research in the future. It also presents a critique of the research design and framework. Section 6.2. reviews at the research questions, examines the implications drawn from the findings, and presents some avenues for future research. It contains sub-sections for each of the capitals. Section 6.3 looks at the issues in the design and execution of the research. Section 6.4 looks at some of the issues with the capacity framework based on the data from the interviews. It concludes with a few general recommendations for water governance and for future research.

6.2 The Findings and Implications

The purpose of this thesis was to assess the current capacity and capacity-building needs for water governance in Alberta as perceived by direct participants within the water governance structure. This thesis was organized around two objectives. The first was to develop a conceptual framework of water governance capacity, based on the capacity literature from disciplines such as natural resource management, community development, sociology, and geography. This device was used to inform the second objective: to conduct an assessment of current water governance capacity and capacity-building needs as perceived by participants in Alberta's water governance partnership. The research questions that needed to be answered in order to complete the second objective were: 1) What capacity do stakeholders have? 2) Where is there a lack of capacity in water governance? 3) What tools or resources are needed to build capacity? and 4) Where should capacity be built? These questions were answered using the

conceptual framework to guide the research design which involved interviewing key informants and analyzing key government water-related documents.

The results found that overall there are few aspects of the water governance structure that have capacity and many aspects that require capacity-building when using the five capitals to examine the structure (see Table 6.1 below). Indeed, if only the overall outlook were used, it would be deemed that the water governance structure does not have the capacity to do water governance at all. However, when the data are examined at the level of each capital, it is apparent that there are points in the structure that do have capacity, that do not have capacity, and that have no relevance to the structure at all.

Natural capital data shows that few of the participants commented on the importance of natural capital in a water governance capacity. There were only two elements of natural capital, connection to nature and the provision of ecosystem services, discussed by the participants. The participants made both negative and positive comments about the elements discussed. While this is consistent with the current debate found in the literature on natural capital, there are implications to water and water governance.

Two issues are found in the negative comments made by the participants which were directed towards the general public. There is a fear that the general public do not fully understand how their access to nature can actually create long lasting, perhaps even permanent, damage to the environment and water quality. This is also the concern expressed about the way natural capital and the ecosystem services provided are valued by society. Without a valuation system, society has little understanding of what is provided, the benefits of that provision, and the costs when those services are diminished.

Table 6.1: Overall Status of Capacity

Capacity Status				
Capital Type	Element	Sufficient Capacity	Needs Building	Undetermined or Not Mentioned
Natural	Ecosystem Services	X		
	Extractable Natural Resources			X
	Income/ Jobs from Resource Extraction			X
	Appreciation of / Access to Nature		X	
Economic	Public Infrastructure		X	
	Government Budget & Cash Flows		X	
	Diversity to Community Cash Streams		X	
	Access to Markets			X
	Resilience to Market Fluctuation		X	
	Grassroots Access to Grants		X	
	Transparency & Accounting		X	
	Harvested Resources		X	
Human	Education	X		
	Job Experience	X		
	Life Experience & Acquired Skills		X	
	Individual Health		X	
	Entrepreneurship			X
	Leadership		X	
	Human Resources Development			X
	Willingness to Participate			X
	Diversity			X
Social	Trust & Reciprocity		X	
	Values, Attitudes, & Behaviours		X	
	Commitment			X
	Norms & Sanctions			X
	Networks & Information Flows	X		
	Collective Action & Participation	X		
	Collective Representation & Association			X
	Motivation		X	
	Knowledge Building and Dissemination	X		
	Sense of Place			X
Institutional	Human Resources Development	X		
	Inter-Organizational Relationships		X	
	Communication & Information Sharing	X		
	Rules & Incentives		X	
	Technical	X		
	Institutional Culture		X	
	Representation & Public Involvement		X	
	Political Influence	X		
	Management Practices and Procedures		X	

These two issues could be resolved with publicly accessible courses, programs, workshops, and information campaigns that are designed to specifically raise awareness. An example of a program is the City of Edmonton's *Master Naturalist Program* which is designed to build local capacity and local knowledge of the City's environment (City of Edmonton, 2014). If this type of program, non-credit and long-term, is coupled with shorter information dissemination activities and communication strategies, the public will become more aware of their own impacts and the value of their environment.

While there were areas with a lack of capacity in natural capital, there were aspects that does have capacity. We do have access to nature, and this can be an unintended result of projects not related to natural capital. As one participant pointed out, the program *Communities in Bloom* has encouraged community green space and beautification. Infrastructure for water, stormwater, and wastewater services contributes to public access to nature in two ways. First, it contributes indirectly to supporting programs such as *Communities in Bloom* by providing the hardware to deliver the water necessary for green and growing things. Secondly, it contributes directly by the inclusion of manmade or natural wetland green spaces in neighbourhoods to manage stormwater runoff. This type of infrastructure also increases ecosystem services.

Economic capital is the capital found to have the least capacity. There were seven elements of economic capital discussed by participants. These were funding (3 aspects), resilience to market fluctuations, transparency, and infrastructure. While there were positive comments made, the majority of comments were negative. This has the potential to significantly influence the future of water governance.

It became clear during the interviews and analysis is that access to funding is critical to the existence and continuation of all groups, departments, and organizations involved in water governance. It was also clear from the content analysis of relevant documents that the government is focused more on evaluating, documenting, and ensuring adequate supply of water for economic purposes than supporting the resource needs of the organizations involved in water governance. Participants were quick to state that their organizations were able to access funding but some participants' organizations struggled to access appropriate, consistent, and/or adequate funding. This is problematic because the success of the *Water for Life* strategy relies on the multitude of government mandated agencies, non-governmental organizations, and local governments working at all scales to accomplish water governance and management. Participants were understanding of the fact that there is a limitation to and a demand for funds in general and that the provincial government was accountable for all money it spends.

While it would be difficult to find a fair and equitable solution, participants mentioned some ways of building capacity in this area. One suggestion was to set up a guaranteed funding system that would provide a set amount of dollars over a set number of years delivered to the government mandated agencies and to an agency that oversaw funding for the non-profit organizations that work at the grassroots level. The delivery system would be relatively easy to set up as there is already a strong partnership network for the Alberta Water Council, the WPACs, and —through Alberta Stewardship Network— the grassroots organizations. This type of a funding formula would create stability across the partnership, provide the organizations some room to plan programs and projects that span more than one year, and free up valuable time currently spent on the funding search-

apply-report cycle. A second suggestion from the participants was to move the WPACs towards becoming regulatory bodies capable of levying taxes similar to those found in Ontario. An alternate suggestion was to have the province legislate a per capita levy for each WPAC that would be calculated, collected, and distributed by the province. All three suggestions would need research to understand how the changes would impact both provincial and organizational budgets. Research would also be needed to understand the outcomes from this type of change.

Another key finding in the economic capital data is that physical infrastructure (other than dams and irrigation) was a topic of discussion for local governments but not other groups. It was found that funding is directly linked to the planning and execution of infrastructure projects. Participants stated that they were able to access 1/3-1/3-1/3 type funding (where the cost is shared three ways with the local, provincial and federal government) for some of their projects but not all. Further, not all types of infrastructure are funded. For example, a water treatment plant upgrade or replacement will be eligible for funding but the pipelines that deliver the water will not. Resilience to market fluctuations, an element under the financial portion of economic capital, is also linked to the ability to fund and build new or replacement infrastructure in a timely manner. As one participant pointed out, major disasters as well as economic booms create longer term problems for local governments as these events drive up demand for materials. This in turn drives up cost for the local government. The implications of these are already apparent in some communities and can be seen in the data from the interviews. Issues include safety, aging and malfunctioning infrastructure, insufficient carrying capacity in the pipes, reservoirs, settling ponds, and stormwater systems. This is not a problem

unique to Alberta. It has been estimated that Canada has a \$123 billion municipal infrastructure deficit, of which approximately \$88 billion is in water and wastewater systems alone (Mirza, 2007). More research is required to provide solutions to this problem.

Human capital had five elements discussed by participants. These were education, job experience, life experience, leadership, and individual health. The majority of comments about job experience and education were positive and all of the comments about life experience and individual health were negative. The majority of comments about leadership were negative. Data from the interviews show that a new element, human resources which covers recruitment and retention, needs to be added as a new element to human capital. There were an equal number of positive and negative comments about human resources development. The data also shows that indigenous and local knowledge fits as an element of social capital rather than human capital. While the literature on human capacity partially matches the experiences and perspectives of the participants, there are direct implications to water governance.

Although there were positive comments made by participants on the topic of human resources development, it was made clear that there are issues in specific areas of recruitment and retention. The first issue is that of an aging workforce. The second issue is that of the difficulty in getting out-of-province workers' training accepted by the province. The third is retaining workers in smaller communities. None of these will be resolved solely by the stakeholders in the water governance structure as they apply equally across the province. It should be noted in the case of training that the stakeholders could work with their counterparts in other provinces to create a training program similar

to the inter-provincial *Red Seal* program. This program allows journeymen to write an exam based on common standards that, once passed, allow the journeyman to work anywhere in Canada without further examination (Employment and Social Development Canada, 2014).

Both life experience and individual health were seen in a negative capacity. Leadership also held a majority of negative comments. The comments made around life experience and leadership were about the knowledge and training of the public who sit as board members or participate in the participatory planning process. With regards to the lack of life experience, it was suggested by one participant that starting in elementary or secondary school, people are instructed in how to provide service to one's larger community. The participants did not have any suggestions for leadership development other than to say that the Alberta government's *Board Development Program* was excellent for helping boards with policy development but needed to expand to include a course on how to be a board member. In other words, it is recognized by the stakeholders that there is a need for new board members to understand their roles, limits to those roles, and how and why board work is done, and how to participate in a collaborative or participatory environment.

Individual health was seen in a negative capacity by all that spoke on the topic. Each participant was specific in directing the conversation to burnout and the toll that it has on the individual and the workplace. There were direct links between burnout, staffing levels, and funding. The participant who spoke on burnout from a local government perspective suggested that when developing regional water and/or wastewater systems, an integrated staff training program should be instituted. At a minimum, water and

wastewater operators in a region would be trained on each other's equipment and procedures, allowing for emergency and vacation coverage when a neighbouring community is short of operators. From the perspective of the participants, non-profit organizations have difficulty in securing funding for paid positions, especially when they are small or trying to establish themselves. It is clear from the *Water for Life* strategy that many of these organizations are on the front line of implementing a wide variety of projects covering everything from riparian restoration to educational programs. Those responsible for allotting work to these groups need to be aware of the burnout issue and include mitigation and prevention strategies in their work/grant programs.

Social capital. There were only five elements of social capital discussed by participants. These were collective action and participation, networking and information flows, individual values, attitudes, and behaviours, motivation, and trust. All of the comments about trust were negative. These comments were about the trust between the stakeholders and the provincial government. The majority of comments about individual values, attitudes, and behaviours, and motivation were negative. A new element, knowledge building and dissemination, needs to be added to social capital. The majority of comments about knowledge building and dissemination, networks and information flows, and collective action and participation were positive. While the literature on social capacity partially matches the experiences and perspectives of the participants, there are direct implications for water governance.

The first implication is that social capital is one area that does have capacity across the majority of the elements covered. Two areas that are seen by participants as having capacity are knowledge building and dissemination and networks and information flows.

This is not to say there isn't room for improvement. For example, one participant suggested that it is difficult for a person or organization to develop an interest and build connections in water and water governance when they are just starting out. This is because there is such a large number of activities and organizations already participating that it can be difficult to know where to start. While there are directories, such as the ones produced by Alberta Stewardship Network or the Alberta Environmental Network, they are not always all-encompassing or current or easily found (Land Stewardship Centre of Canada, 2005; Alberta Environmental Network, 2014).

Another concern brought forward is that the public seems to be disconnected from the larger picture of water and water issues. This aspect of knowledge building and dissemination is directly tied to the negative capacity in individual values, attitudes, and behaviours. Participants have stated that while their programs are well attended, there is a lack of awareness with the larger picture and participation doesn't translate to the adoption of environmental best practices. This is one area where the education and outreach programs could expand. However this would take longer term funding as assisting the public to change and implement personal environmental best practices requires more than just short workshops or events.

Another area seen as having capacity is in collective action and participation. Here too is the argument that while capacity is there it can be improved. This is important as collaborative processes are seen as the key method to conducting effective governance and outcomes here in Alberta. Participants had noted that there were issues with stagnation built from having the same participants at all tables and/or projects (by not having new ideas generated by having new and diverse participants); the potential lack of

altruism; and the inefficiency (requiring valuable time and staff) of the process.

Participants did not put forward any suggestions to how to resolve these issues; however, the key to solving the issue of inefficiency and lack of altruism may be in what one participant said about collaboration being a state of mind rather than just a process.

Creating a collective state of mind could be achieved through the facilitation process in initial meetings. Further research is required. Further research is also required to combat the issue of stagnation where the same participants sit at the same tables is a problem.

This is not unique to water governance or to Alberta. Connecting into local, provincial and national volunteer resources may provide more assistance on this topic. These resources may help in building a diversified community of experts and volunteers.

Trust is necessary for all aspects of moving water governance forward. It is directly linked to collective action and participation. All the comments made about trust were negative and all the comments were about the trust organizations have in the provincial government. This has strong implications for water governance. If the organizations involved in water governance do not trust the government to follow through or utilize advice or work requested, a fundamental aspect of the partnership process is broken. This in turn will reduce the amount of output from the organizations, thereby placing a greater burden on and need for direct government involvement. It also lowers public perception of legitimacy in the governments declarations of having consulted and/or worked with the public (Trachtenberg & Focht, 2005). To overcome this lack of capacity, the government must find ways to communicate more effectively how, where, and when they make use of the information and work that they themselves have requested of the public and of organizations involved in water governance. They must also be clear as to why they do

not use requested information and/or work. This negative capacity for trust also weaves throughout the elements found in institutional capital.

Institutional capital had all nine elements discussed by participants. The majority of the comments about human resources development; communication and information sharing; technical; and political influence were positive. The majority of comments about rules and incentives; institutional culture; representation and public involvement; and management practices and procedures were negative. When taken as a whole, the majority of the comments made about inter-organizational relationships were negative. However, when divided into sectors, only negative comments were made about the relationships with the government and the relationships between government departments. This has implications for water governance.

Just as the negative capacity for trust was directed at provincial government actions, so too is the negative comments about inter-organizational relationships. This negative capacity for inter-organizational relationships with the government and between government departments is linked to trust from social capital and to negative capacity in both institutional culture and rules and incentives in institutional capital. Building legitimacy with the public and generating buy-in from stakeholders on water governance change or water governance projects will be difficult to do in a negative environment. Negative capacity in rules and incentives —particularly in follow through in enforcement strategies— indicates a lack of respect for the very rules the government itself has put into place. A lack of trust and an institutional culture that reinforces the patterns that lead to a lack of trust can and will slow down progress in the collaborative environment as well. The only group able to provide and implement a solution is the government itself.

Change from within is needed to create a stable and open environment. Once the institutional culture has shifted, it will be possible, over time and with much work, to rebuild trust and positive relationships with the citizens of the province.

The organizations themselves also have negative capacity in institutional capital. This is especially seen in the management practices and procedures. Concepts of time, staffing and funding, which are seen in the discussion on other capitals, strongly influence management practices and procedures. The administrative workload was a big concern for local watershed stewardship groups, WPACs, and local governments. This impacts everything from internal policy development to succession planning to understanding liability. If organizations are allotting staff/volunteer time to administrative efforts, then on-the-ground watershed management activities are not being done. This in turn impedes the whole water governance structure from making as many successes and advances as it could. Although participants suggested that the paperwork for the grant/funding cycle be reduced, they were aware of the need for that type of reporting and did not see the removal of all reporting as a possible solution. To reduce the stress on organizations with regard to management practices and procedures, more research is needed. It is possible that a clearing house or something similar is required to help with accounting, grant applications and reporting, creating basic (and common) forms and paperwork, etc.

6.3 Research Design and Execution

Illustrating the findings through spatial analysis would have demonstrated the capacity for water governance in a format that would have refined the results. The findings suggest that factors of distance from a large centre; community and/or organization size; and community affluence have an influence the capacity of communities and

organizations. In other words, it was observed during the research that the participants based in or near large municipalities —while not necessarily having full capacity at all times in all capitals— discussed all aspects of capacity with greater positivity than those based in smaller, more remote communities. Having a small sample size meant that a map of the locations of each interviewee was not possible as it would potentially reveal the identity of the participants. This means this project was unable to demonstrate the spatial findings. Future research could avoid this problem by using mixed methods and include a survey that would to all stakeholders in each basin. The aggregated data from such a survey could then be mapped.

The other area of the research design that did not work well were the questions to the participants on capacity-building. It is not that there were no answers to this question. Indeed, participants provided suggestions to build capacity, as shown throughout the findings and discussion chapter. However, the participants did make comments that they could have provided more or better information had they had time to think about the question. This question might have been better served through the use of a workshop or a panel discussion.

One issue, beyond the control of the research design, was that not all sectors were represented. The perspective from Alberta Energy, Alberta Municipal Affairs, and from federal government departments that have influence on water and water infrastructure would have provided a more rounded idea on the expectations and perceived outcomes and advances from the government. The lack of any First Nations perspective means their experiences with water governance is not heard in this project. This holds true for the lack of perspective from other large industries. While agriculture is the largest user of

water in the South Saskatchewan River basin, industry is a large consumer of water in other regions of the province. That these sectors were not represented means that the results are limited in scope.

Another issue beyond the control of the project was the flooding that interrupted the interviews. During the interview process each basin had a flood event or series of flood events, including a catastrophic 100-year flood event in the South Saskatchewan River basin. This did have an impact on the interviews. It did cause scheduling and rescheduling difficulties, as well as the complete cancellation of one interview with a local watershed stewardship group. It also meant that the floods often became an example used to illustrate points during the interviews. These experiences may have impacted the data collected due to the freshness of the events and the intensity of work and emotion created by the events.

6.4 Issues with the Capacity Framework

While the thesis answered the questions described above, it should be said that it quickly became apparent during the analysis that there were two additional questions that could have been addressed. The first was a question of which elements of capabilities in each of the capitals were relevant to the analysis of Alberta's water governance structure. The framework of capacity was created by pulling the elements from key research papers found in the literature review but had been untested. During the interviews it was shown that there were several of these elements that might not pertain to the group of stakeholders interviewed. An example of this was the lack of discussion on entrepreneurship. Diversity also was an element that was not discussed. Some of the elements needed to be shifted to another capital to better suit water governance stakeholders. For example, knowledge building and dissemination needed to be moved

from human capital to social capital as the findings demonstrated that it is a collective endeavour rather than for the individual. Other elements could be reworded to better reflect the language used in the province. An example of this is the use of the term collaboration for collective action and participation. It was further shown that some elements were incapable of being applied to a multi-level governance structure. The element of inter-organizational relationships is one example. It was incapable of showing both the government to government department relationships and the government to organizations relationships. It is possible that the methods chosen to conduct this particular project contributed to the above mentioned problems. It is important that further research be done that tests the applicability of the elements of capabilities beyond what has been done here. It would be especially helpful to discover a way to expand and contract the elements to better reflect different scales of governance.

The second unspoken question is related to the relevance of using a capacity framework to evaluate the capacity of the structure. One issue that is not really discussed in the literature is the fact that each of the elements of capabilities have been described as an end-point that is fully complete and can stand alone as a representation of some format of capacity. However, when reflection takes place it becomes obvious that each one of these elements requires a set of capacities —consisting of one more of the capitals— in order for it to exist. For example, building and disseminating knowledge requires many elements including trained and skilled people (human capital), networks and information flows (institutional capital), finances (economic capital), and collective action and participation (social capital). This means that when seeing a negative capacity in an

element of capability, one has to question whether the negative capacity is because of a lack of capacity in the element or in the things needed to create that element.

Further to this, it is apparent in the discussions with the participants that there are certain linkages that thread through each of the capitals. The answer of people, time, and money are given repeatedly by the participants when asked what is needed for positive capacity. Even when the discussion revolved around improving human and economic capitals, the answer was still people, time, and money. Other linkages were communication and technical. For example, when participants were discussing trust, one of the recommended capacity-building pieces was around how the government communicates its use of the advice and recommendations back to the public. The lack of communication is a barrier to trust. These five things are not necessarily capacities rather they are mechanisms to capacity. Indeed, Morgan (2006) does seem to better explain capacity as the capability to act, to generate development results, to relate, to adapt, and to achieve coherence. This means that capacity is a functional cross-representation of one or more of the capitals and one or more element in each capital (Morgan, 2006). This would explain why people, time, money, communication, and technology are threaded throughout. These five elements are necessary to each capital and each element of capability.

6.5 Conclusion

The use of the capacity framework allows one to identify areas of capacity and areas where capacity is lacking. By itself, it cannot measure capacity in a concrete manner. However, it does provide a way to organize research and to think about all that is necessary to develop and utilize a water governance structure. This information in turn can be used to create measures of capacity that then could evaluate the governance

structure. As Alberta's water governance structure is multi-level, any evaluation needs to be scalable. It also needs to be mappable, as spatial analysis techniques might be necessary to tease out differences in scale and across regions.

As had been stated at the beginning of the findings and discussion chapter by Max L, from a WPAC, "Everything that we achieve, every success that we enjoy is work that simply would not have occurred had not we done it. And we have obviously the right capacity because we did it." Alberta's water governance structure has produced results. From the perspective of the stakeholders, capacity is there. However, also from the perspective of the stakeholders, capacity needs to be improved across the majority of capitals if the province wants to improve its results and outcomes. In particular, attention needs to be paid to the five mechanisms —people, time, money, communication, and technology.

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Appendix A

Recruitment of Key Informants

Location	Type	Number
Central	Federal Government	3 (one from each Environment Canada, Agriculture & Agri-Food Canada, Natural Resources Canada)
	Interprovincial Agencies	1
	Provincial Government	3 (one from each Agriculture & Rural Development, Environment & Sustainable Resource Development, Alberta Municipal Affairs)
	The Alberta Water Council	1
	Industry	3 (one from each of three different industries - Oil and Gas, Forestry, Energy/Utility)
Athabasca River Basin	Local Government	3 (one large municipality, one small municipality, one county or municipal district)
	Watershed Planning and Advisory Council	1
	NGOs & LWSGs	3 (pulled from local watershed stewardship groups and non-government organizations)
	First Nation Band Council	1
North Saskatchewan River Basin	Local Government	3 (one large municipality, one small municipality, one county or municipal district)
	Watershed Planning and Advisory Council	1
	NGOs	3 (pulled from local watershed stewardship groups and non-government organizations)
	First Nation Band Council	1
South Saskatchewan River Basin	Local Government	3 (one large municipality, one small municipality, one county or municipal district)
	Watershed Planning and	1

	Advisory Council	
	NGOs	3 (pulled from local watershed stewardship groups and non-government organizations)
	First Nation Band Council	1
	Irrigation Districts	1
	Total	36

Appendix B

Dear _____:

My name is Amber Zary and I am a graduate student at the University of Lethbridge. I am working on a project that is titled Stakeholder Perception of Capacity and Capacity-Building Needs in Alberta's Water Governance Structure. As a part of this project, I invite your participation in an in-depth interview on this topic. The interview would be conducted face-to-face at a location and time convenient to you in your community and should take approximately one to one and a half hours of your time to complete.

Please find attached a full letter of invitation that provides further information on the research project on assessing the capacity and capacity-building needs in Alberta's water governance structure.

Should you have any questions or concerns please feel free to contact me by email at amber.zary@uleth.ca or by phone at 403-329-2535. I look forward to hearing from you on your decision to assist me on this research project.

Sincerely,

Amber Zary, Graduate Student

Appendix C



University of
Lethbridge
4401 University Drive
Lethbridge, Alberta
T1K 3M4
TEL: (403) 329-2534
FAX: (403) 329-2016

Department of Geography

Date: _____

Dear _____;

My name is Amber Zary and I am graduate student at the University of Lethbridge. For my thesis I am working on a project that is titled Stakeholder Perception of Capacity and Capacity-Building Needs in Alberta's Water Governance Structure. In particular I am researching the capacity and capacity-building needs of organizations involved in water governance, the water governance structure itself, and how those capacities might be impacted by changes to legislation such as the new Land-use Framework. As a part of this project, I invite your participation in an in-depth interview on this topic. The interview should take approximately one to one and a half hours of your time, with a potential half to one hour follow-up interview. The interview(s) will be audio-recorded with your permission. The interviews will take place in your community in a location convenient to you.

There are no anticipated risks or discomforts related to this research. Your name and your organization's name will not be used at any time; results will be reported so that no individual respondents could be identified. If you feel uncomfortable with any question you need not answer it however, the remaining answered questions will be included in the research project. Should you feel uncomfortable with any part of this study at any time, you are free to request your interview, in its entirety, be withdrawn from the project. There are no direct benefits in participating in this research to you as an individual; however you will be contributing to an improved understanding of water governance.

Several steps will be taken to protect your anonymity and privacy. While the interviews will be tape-recorded, the voice files will be destroyed once they have been transcribed. The typed interviews will not contain any mention of your name, and any identifying

information from the interview will be removed. Also, the typed interviews will be kept in a locked filing cabinet at the University of Lethbridge while electronic versions of the interviews and transcripts will be kept on a password protected computer. Only myself and my thesis supervisors, all under professional obligation to keep all information confidential, will have access to the interviews. All information will be destroyed in five years.

A short report summarizing the results will be published on the internet at <http://www.waterresearch.net> in advance of the final results being published as part of a Master's Thesis as well as in professional and academic journals and in conference presentations and proceedings papers to academics and policymakers. When using individual quotes from the in-depth interviews pseudonyms will be used and where appropriate reference will be made to the type of stakeholder organization the respondent belongs to. At no time will an individual be identified.

If you have any questions or require further information about this study please contact myself, Amber Zary, at 403-329-3029 or amber.zary@uleth.ca. You can also contact my supervisors Dr. Wei Xu in the Department of Geography (phone: 403-332-4561; email: wei.xu@uleth.ca) or Dr. Henning Bjornlund in the Department of Economics (phone: 403-317-2884; email: henning.bjornlund@uleth.ca). Questions regarding your rights as a participant in this research may be addressed to the Office of Research Services, University of Lethbridge (phone: 403-329-2747 or email: research.services@uleth.ca).

Thank you in advance for your interest in this project, and if you would like to participate please sign this consent form below.

Amber Zary, B.A.

Student Investigator

I have read (or have been read) the above information regarding this research study on Stakeholder Perception of Capacity and Capacity-Building Needs in Alberta's Water Governance Structure, and consent to participate in this study.

_____ (Printed Name)

_____ (Signature)

_____ (Date)

Appendix D

Interview Guide

Thank you for meeting with me. *Pull out a copy of the Letter of Consent and hand to participant.* Did you have a chance to read the Letter of Consent?

If yes: Do you agree to participate in the interview?

If yes: Have participant sign two copies (one for their records, one for interviewer records).

If no: Thank-you for your time. End interview.

If no: Read or ask them to read the letter.

Do you agree to participate in the interview?

for If yes: Have participant sign two copies (one for their records, one interviewer records).

If no: Thank-you for your time. End interview.

Pre-Interview Questions:

ID # _____

1. Type of organization: _____

2. Watershed: _____

3. Gender: _____

4. Years of water governance service: _____

5. Preferred pseudonym: _____

6. Preferred organization's pseudonym: _____

Interview Questions:

Let me tell you a bit about how I am defining capacity. Capacity is a term most often used to describe the capability - actual or potential - of individuals, organizations and institutions, and society as a whole to perform, manage, solve, accomplish, or withstand determined objectives or situations. Capability has qualities, features, attributes that exist and/or can be developed in order to have capacity. These elements or features can be

categorized in many ways but it is common to see five groupings - institutional, social, human, economic and natural . Capacity building is the development and growth of the various elements in order to increase capacity to a pre-determined level.

By stakeholders I mean those groups, organizations, departments, agencies, etc. that participate in or have an impact or influence on water management across Alberta. This would include groups such as local watershed stewardship groups, a national NGO with an Alberta chapter, a municipal, provincial or federal government department, a First Nations band council, a quasi-government or multi-government agency, an industry with a large water requirement and many others.

With that in mind,

1. Tell me about your organization and how it is involved with water governance.

Prompt questions to explore institutional capital: What is your organization's mandate? What kinds of documents does your organization have in order to operate? How does your organization share information internally and externally? Who does your organization share information with? What technical tools does your organization use? How does your organization interact with the public? How does your organization interact with the government/other government departments? Who is represented in your organization? Which other organizations has your organization worked with?

Prompt questions to explore human capital: What kind of training or mentorship does your organization provide its employees/volunteers? Does your organization make use of volunteers? What are the roles and expectations of volunteers? Does your organization include indigenous/local knowledge into your work? In what ways? How does your organization develop leadership? What are the skills required/needed for your employees/volunteers?

Prompt questions to explore social capital: Who does your organization network with? What methods does your organization use to network with others (eg. conferences, meetings, etc)? What motivates your organization/members/employees/ volunteers? How does your organization build commitment? What values/attitudes /behaviours about/around water governance are important to your organization? Is sense of place important? Do you attend conferences (and which ones)? How do you share information learned from conferences and/or meetings?

Prompt questions to explore economic capital: Does your organization have a budget? How does your organization incorporate transparency? Do you create annual reports that include how your budget was dispersed? What types of income streams (e.g. grants or membership fees) does your organization have? Do you make use of college and university partnerships and research funds? What infrastructure (irrigation systems, buildings, etc) is your organization responsible for? Does market fluctuations impact your finances?

Prompt questions to explore natural capital: What is the cultural importance of water to your organization? Does your organization contribute to job creation/economic development? Does access to nature/appreciation of nature impact your organizations goals and objectives?

2. Tell me about a successful project you and your organization has implemented.

Prompt questions: What was the goal/were the goals of the project? Why was this project important? How was the need for this project determined? What outcomes did you get? How were those outcomes measured and/or monitored? Who was involved in the project from your organization? Where there other organizations or groups involved? What permissions did you require? How did you get support (financial, opinion) for the project? Did you fundraise for the project? What types of grants did you access for the project? How long did the project take from beginning to end? Where there delays and if so why? How did communication and information flow throughout the project? What resources did your organization use to complete the project? What made it "successful"? What could have made it more successful/easier? Where you able to fully use/access available resources (technical support, finances, lobbyists, promotions, etc), and if not why not?

3. What resources, tools, techniques, policies, guidelines or mechanisms could be developed or better accessed in order for your organization to accomplish its goals?

4. Can you tell me how the land-use framework will impact your organization and water governance in general?

Prompt questions: Will the focus of your organization change? What new tasks, goals, or objectives will need to be done? Will the focus of governance structure change? What skills and resources will be needed and/or useful for dealing with the requirements?

This ends the questions I have for you. Is there anything else about capacity and capacity-building that you would like me to know about?

If yes: listen, ask probing questions for clarification, deeper understanding.

Probing questions: You mentioned _____, can you tell me more? I'm not quite sure I understood _____, could you tell me more? Can you give an example of _____?

Thank you for taking the time to answer my questions. May I contact you if I have further questions?

yes / no

Once the interview has been transcribed I will send you a copy for your review. Should you have any questions about today, about the contents of the transcript, or about the research project please contact me by email at amber.zary@uleth.ca or by phone at 403-329-2535.

Appendix E

Data Saturation and Code Generation

Data Saturation and Code Generation				
Interview Number/Order	Number References	Total Themes	Number of New Sub-Themes	% Cumulative Sub-Themes Generated
ID 01	26	16	16	12.9
ID 02	26	18	14	11.3
ID 05	51	30	26	21.0
ID 09	17	10	3	2.4
ID 13	27	16	8	6.5
ID 15	22	16	8	6.5
ID 33	29	21	7	5.6
ID 16	29	13	3	2.4
ID 30	30	21	8	6.5
ID 18	52	32	12	9.7
ID 28	18	11	2	1.6
ID 22	38	22	2	1.6
ID 21	34	20	4	3.2
ID 17	26	13	0	0.0
ID 10	27	15	1	0.8
ID 35	40	15	1	0.8
ID 29	16	11	0	0.0
ID 06	12	10	0	0.0
ID 27	9	7	2	1.6
ID 19	42	28	4	3.2
ID 04	56	19	2	1.6
ID 20	12	9	0	0.0
ID 12	35	17	0	0.0
ID 40	48	33	1	0.8
ID 34	18	14	0	0.0
ID 23	24	16	0	0.0
Totals	779	N/A	124	100

Appendix F

Top Ten Topics By Participant and by Mentions

Top Ten Topics				
Rank Order	Topic	# of Participants	Topic	# of Mentions
1	Knowledge Building & Dissemination	23	Governance Development	179
2	Funding	21	Technology and Communication Tools	72
3	Governance Development	20	Knowledge Building & Dissemination	70
4	Board, Staff, & Volunteer Development	19	Board, Staff, & Volunteer Development	58
5	Technology and Communication Tools	17	Funding	53
6	Collaboration	16	Collaboration	48
7	Networking	14	Organizational Development	32
8	Organizational Development	12	Networking	26
9	Individual Perception, Values, Meanings	9	Individual Perception, Values, Meanings	22
10	Staffing and Volunteers - Management of	9	Staffing and Volunteers - Management of	19

Appendix G

Top 100 Words Four Characters or More

#	Word	Length	Count	Weighted Percentage (%)
1	water	5	1910	6.39
2	alberta	7	671	2.24
3	management	10	550	1.84
4	watershed	9	383	1.28
5	life	4	308	1.03
6	planning	8	296	0.99
7	aquatic	7	263	0.88
8	plan	4	262	0.88
9	environment	11	230	0.77
10	government	10	191	0.64
11	quality	7	190	0.64
12	information	11	180	0.60
13	council	7	176	0.59
14	conservation	12	168	0.56
15	strategy	8	165	0.55
16	albertans	9	144	0.48
17	report	6	141	0.47
18	drinking	8	139	0.46
19	action	6	138	0.46
20	term	4	136	0.45
21	provincial	10	134	0.45
22	actions	7	133	0.44
23	framework	9	131	0.44
24	public	6	126	0.42
25	plans	5	119	0.40
26	resources	9	116	0.39
27	support	7	114	0.38
28	develop	7	108	0.36
29	ecosystems	10	107	0.36
30	issues	6	106	0.35
31	river	5	102	0.34
32	knowledge	9	100	0.33
33	protection	10	99	0.33
34	system	6	98	0.33
35	development	11	96	0.32
36	objectives	10	93	0.31
37	progress	8	89	0.30
38	province	8	89	0.30
39	research	8	87	0.29
40	resource	8	87	0.29

41	sustainable	11	87	0.29
42	land	4	86	0.29
43	ensure	6	85	0.28
44	advisory	8	83	0.28
45	establish	9	83	0.28
46	partnerships	12	83	0.28
47	health	6	82	0.27
48	provide	7	80	0.27
49	work	4	79	0.26
50	stewardship	11	77	0.26
51	supply	6	74	0.25
52	program	7	72	0.24
53	reporting	9	71	0.24
54	implement	9	70	0.23
55	include	7	70	0.23
56	complete	8	69	0.23
57	environmental	13	69	0.23
58	regional	8	69	0.23
59	needs	5	67	0.22
60	based	5	66	0.22
61	healthy	7	66	0.22
62	watersheds	10	66	0.22
63	groundwater	11	65	0.22
64	monitoring	10	65	0.22
65	process	7	65	0.22
66	recommendations	15	65	0.22
67	area	4	64	0.21
68	long	4	64	0.21
69	sector	6	64	0.21
70	activities	10	63	0.21
71	councils	8	63	0.21
72	systems	7	63	0.21
73	economic	8	60	0.20
74	groups	6	60	0.20
75	local	5	60	0.20
76	wetlands	8	59	0.20
77	areas	5	57	0.19
78	economy	7	55	0.18
79	implementation	14	55	0.18
80	education	9	54	0.18
81	basin	5	53	0.18
82	lake	4	53	0.18
83	productivity	12	53	0.18
84	tools	5	53	0.18
85	stakeholders	12	52	0.17

86	decision	8	51	0.17
87	direction	9	51	0.17
88	making	6	51	0.17
89	safe	4	51	0.17
90	improve	7	50	0.17
91	including	9	50	0.17
92	partners	8	50	0.17
93	state	5	50	0.17
94	future	6	49	0.16
95	policy	6	49	0.16
96	goals	5	48	0.16
97	municipal	9	48	0.16
98	protect	7	48	0.16
99	quantity	8	48	0.16
100	short	5	48	0.16