

# Taking the “Rains” into Local Hands: Water Governance in British Columbia

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## ABSTRACT

Flowing clean water is essential for functioning and healthy watersheds to provide life, economy and future to society. Canada’s water crisis is said not to be one of scarcity, but of water governance. The complexity of a top-down governance approach has complicated action on environmental challenges in British Columbia. The current system is not serving social, ecological and long-term economic needs through water governance. Supply-management perspectives have dominated water policy through the belief that nature could be shaped to suit the needs of society, and that water was never a limiting factor of growth. Watersheds are unable to cope with the pressures generated by development, which deplete available water leading to a decrease in the overall resiliency of the system. Communities are faced with water challenges like droughts, rapid resource development, and contaminated drinking water. The status-quo approach has proven to no longer have the capacity to respond these issues, and citizens are beginning to recognize the need for more direct civic engagement at local watershed scales. A distributed governance regime is needed to address resource management challenges at a local watershed scale to enact harmonization and liaison between all scalar jurisdictions of governance. British Columbia’s *Water Sustainability Act* presents a valuable opportunity for local watershed governance in British Columbia.

**KEYWORDS:** Water Governance, Supply-Management, Basin Overbuilding, Resource Management, Local Watershed Entities, Collaboration, Environmental Governance

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## INTRODUCTION

Fresh water resources are the Earth's most critical assets. Flowing clean water is essential for functioning and healthy watersheds to provide life, economy and future to society. The attempt to strike a balance between ecological, economic, social and spiritual importances of fresh water has presented many challenges in managing water sustainably - a challenge that Canada has been grappling since time immemorial (Brandes and O'Riordan 2014). Canadians have become masters at intervening with hydrological regimes and manipulating natural landscapes to conveniently suit the demands of a growing society and fuel the desire of a thriving economy (Walkem 2007, Brandes and O'Riordan 2014). This open and vast landscape that once enticed immigrants to settle and exploit its perceived infinite resources is now suffering the consequences of mismanagement centuries later (Brandes et al. 2007). Canada is well known in the media and by politicians alike, for its myth in abundance and wealth of fresh water resources (Bakker 2007a, Sprague 2007). Common claims state that "Canada has one-quarter of the world's fresh water supply" and that Canada is a "water wealthy country" (De Loe and Kreutziser 2007, Sprague 2007). This may seem apparent in iconic Canadian images of glacier lakes, waterfalls, and lush landscapes, but this is not the case for the future of Canada's fresh water.

The source of these claims are derived from the geography in which fresh water is stored (Sprague 2007). The overestimation of Canada's water resource may be a representation of *water supply*, which is a function of the depressions that hold water in the landscape (Sprague 2007). The water that is present in these lakes are from thousands of years of glacial retreat, which are rapidly disappearing from Canadian mountaintops and are no longer replenishing the supply (Bakker 2007a, Nowlan 2007, Sprague 2007). Since 1850, over 1300 glaciers have reduced their mass by 25-75%, in which most of the reduction has been in the last 50 years following an increase with climate change (Nowlan 2007). The volume of Canada's water supply makes up about 20% of the world's freshwater lakes, where 18% rests in the Great Lakes, and is considerably different than the *renewable supply* (Sprague 2007). The renewable supply includes precipitation and fresh water runoff that flows along the contours of the land into catchment basins and replenishes the sources of fresh water supply at varied locations annually (Sprague 2007). The renewable supply of the total volume in the Great Lakes is a mere 1% each year (Schindler 2007). Another unique aspect of Canada's geography is that 60% of the available fresh water flows north to the Arctic seas away from 85% of Canada's total population who live along the Southern border (De Loe and Kreutziser 2007, Schindler 2007, Sprague 2007, Bakker and Cook 2011). Overall Canada ranks third in the world's renewable supply at 6.5% and is tied with China and the United States; however, when all variables are considered with the 40% of fresh water available to the majority of the population in the South, then the accurate total would be 2.6% of the renewable supply (Sprague 2007). If 2.6% of accessible fresh water is renewed each year for 85% of the total population of Canada, then Canada rests in ninth place in the world's renewable supply between India and Congo. Nevertheless, Canadians are one of the largest consumers of water in the world (Shrubsole and Draper 2007). A growing concern with fresh water resources is that climate change is expected to exacerbate and affect not only

the quantity but quality of water as well (Shrubsole and Draper 2007, Bakker and Cook 2011, Lautze et al. 2011, Brandes and O’Riordan 2014). Contaminants and minerals will no longer be diluted with excess fresh water, and will negatively affect the water quality (Bakker and Cook 2011, Lautze et al. 2011, Brandes and O’Riordan 2014). Canada’s fresh water sources are limited, and require critical management.

Canada’s water crisis is said not to be one of scarcity, but of water governance (Brandes et al. 2007, De Loe and Kreutziser 2007, Lautze et al. 2011, Brandes and O’Riordan 2014). Water governance has emerged to be one of the most important topics of the 21<sup>st</sup> century, and has been placed on international agendas as a leading priority that requires immediate action (Lautze et al. 2011). Water governance can be defined as the processes and institutions through which water-related decisions are made and uses models, principles and information to make these decisions (Reed and Bruyneel 2010, Lautze et al. 2011). The distribution of power and authority is expanded horizontally across jurisdictions and defined at multiple vertical scales of governance (Bakker 2007a, Reed and Bruyneel 2010). It is distinct from *water management*, which focuses on the operational and technical aspects of water (Reed and Bruyneel 2010, Bakker and Cook 2011, Lautze et al. 2011). Water governance seeks to define the goals of water management and align practices with desired outcomes by providing a framework that links planning to implementation (Lautze et al. 2011). A well-established governance framework is imperative to defining water management goals within a watershed (Lautze et al. 2011).

Unfortunately, water governance has not received the amount of attention it has deserved in Canada and is extremely complex (Molle 2009, Lautze et al. 2011, Brandes and O’Riordan 2014). Canada lacks an overall federal water strategy, and is currently one of the only countries of the Organization for Economic Co-operation and Development (OECD) that does not have legal and enforceable federal drinking water standards (Muldoon and McClenaghan 2007, Bakker and Cook 2011). Canada’s groundwater reserves are dependent drinking water sources for over 10 million citizens, even though these sources are not properly mapped or consistently monitored (Bakker and Cook 2011). Resource extraction activity is supported by governing agencies throughout the country and has been affecting the health of local watersheds by jeopardizing valuable aquatic habitats (Brandes and O’Riordan 2014). Water governance is further fragmented between four orders of government in Canada: municipal, provincial, federal and First Nations, and is argued to be one of the most decentralized approaches in achieving environmental governance (Bakker and Cook 2011).

Canada’s traditional supply-management focus has minimally considered social, ecological and traditional values into governing policies of fresh water regulation (Brandes et al. 2007). Supply-management perspectives have dominated water policy through the belief that nature could be shaped to suit the needs of society, and that water was never a limiting factor of growth (Brandes et al. 2007). As a result of this approach to supply-management of water resources, watersheds have been subject to basin closure due to overbuilding (Molle 2009). Watersheds are unable to cope with the pressures generated by a supply-management focus, and available water is depleted following a

decrease in the resiliency of the system (Molle 2009). As a result, upstream users and stakeholders have greatly modified the hydrological regime in the upper regions of watersheds and created environmentally injustice relationships with users downstream (Molle 2009). These challenges are outlined by failures in water governance, and can be amplified or resolved through governance action (Molle 2009, Lautze et al. 2011, Brandes and O’Riordan 2014).

A number of watershed communities in British Columbia have responded to these challenges in water governance by creating semi-formal local watershed entities (De Loe and Kreutziser 2007, Brandes and O’Riordan 2014). The current status-quo of water governance in Canada has not properly addressed challenges, and citizens are beginning to recognize the need for more direct civic engagement at local watershed scales (Bakker 2007a, Brandes et al. 2007, De Loe and Kreutziser 2007, Bakker and Cook 2011, Brandes and O’Riordan 2014). Watershed boards and round tables are becoming a desired solution to collaboration and partnerships that act as a nexus to resource-based decisions (De Loe and Kreutziser 2007, Brandes and O’Riordan 2014). This is an attempt to address governance issues from a bottom-up approach where communities have a more established and formal role in some of the decisions that are made within their watershed (De Loe and Kreutziser 2007, Brandes and O’Riordan 2014, Hunter et al. 2014). Citizens can voice local interests, and participate in decisions around ecological, economic and social values (De Loe and Kreutziser 2007, Brandes and O’Riordan 2014, Hunter et al. 2014). British Columbia has recognized the need for local communities to become more engaged in the decision-making process in water policy, and has delegated select governance responsibilities to local watershed institutions in the newly proposed *Water Sustainability Act* (Brandes and O’Riordan 2014). A distributed governance regime is needed to address resource management challenges at a local watershed scale to enact harmonization and liaison between all scalar jurisdictions of governance.

## **WATER GOVERNANCE**

Canada is facing a water crisis from poor management in conflicting views of the ways in how water should be managed (Bakker 2007a, 2007b, Brandes et al. 2007, De Loe and Kreutziser 2007, Muldoon and McClenaghan 2007, Bakker and Cook 2011, Brandes and O’Riordan 2014). Currently, water is viewed as a resource to be exploited and an inherently shared asset (Muldoon and McClenaghan 2007, Shrubsole and Draper 2007). The mismanagement of water is stemmed from the inability of governance to address these views in a robust governance framework (Muldoon and McClenaghan 2007, Bakker and Cook 2011). The major challenge of water governance in Canada is the fragmentation between jurisdictions and scales (Muldoon and McClenaghan 2007, Bakker and Cook 2011, Brandes and O’Riordan 2014). The management of water is scattered amongst four orders of governance: municipal, provincial, federal and First Nations. Water resources are primarily managed by the provinces and territories, where direct constitutional powers focus on water use, land management and control of local governments (Brandes and O’Riordan 2014). The constitutional divisions of powers of water management are divided amongst multiple ministries and departments with complex mandates (Bakker and Cook 2011). The provincial and territorial governments

further decentralize water responsibilities to municipal governments and private actors (Bakker and Cook 2011). The role of the federal government in water resources management is unclear, and has been argued to be in a state of retreat (Bakker 2007a, De Loe and Kreutziser 2007). The responsibilities of the federal government are mainly navigation, fisheries, trans boundary waters and First Nations affairs (Muldoon and McClenaghan 2007, Shrubsole and Draper 2007, Bakker and Cook 2011, Brandes and O’Riordan 2014). There is no clear authority for environmental matters, which is shared between federal and provincial governments (Bakker and Cook 2011). As a result there are failures in inter-governmental coordination, inadequate data collection and accessibility, minimal efforts in monitoring and enforcement, and repeated efforts that are often inefficient (Bakker and Cook 2011). The fragmentation has created significant governance gaps, challenges, and overlaps in Canadian water policy (Bakker and Cook 2011, Brandes and O’Riordan 2014). The current framework lacks harmonization and coordination of water laws between jurisdictions and governance scales.

Water withdrawals and in stream water resources contribute \$7.5 billion to \$23 billion to Canada’s economy annually (Shrubsole and Draper 2007). Fresh water plays a significant role in Canada’s development, but the economic pressures on freshwater ecosystems have been jeopardizing the quality and quantity of fresh water for decades (Brandes et al. 2007, Shrubsole and Draper 2007, Brandes and O’Riordan 2014). Historically, water policies reflected a focus on satisfying the demands of the human population through power generation, resource development, agriculture, recreation and protection from climate variability (Brandes and O’Riordan 2014). Ecological values were not considered in the creation of water policies, and have resulted in irreversible damage to natural freshwater habitats (Brandes and O’Riordan 2014). The lack of a federal water strategy that could encompass some of these ecological values is argued to be due to the fact that water issues are too complex, and have a direct impact on the economy and stakeholders (Muldoon and McClenaghan 2007). Scholars have recognized that water licensing in Canada has always focused on supporting industrial activity, and has lacked commitments to ecological and social values (Christensen and Lintner 2007). Canadian water policy highly favors resource development, and continually neglects important social and ecological interests.

Recently there has been a global shift in policy toward environmental governance, as nations are beginning to realize that governance functions need to be extended upwards to international institutions, downwards from national to local actors, and outwards to include non-state actors (Reed and Bruyneel 2010). This form of governance involves formal and informal institutions, social groups, public citizens, natural processes, ecological interactions and traditions into the decision-making process (Reed and Bruyneel 2010). Canada has been argued to have one of the most decentralized approaches to environmental governance (Bakker and Cook 2011). Environmental governance impinges on resource extraction activities that support provincial economies, and is not favored by the federal government because it provides little incentives (Bakker and Cook 2011). Environmental action will only take place if it is an issue of concern that is being reflected by the majority in federal polls (Bakker and Cook 2011). Thus, Canada is reactively governed in a crisis management mode and lacks federal baseline standards

for environmental policy (Muldoon and McClenaghan 2007). The lack of federal involvement in water policy clearly supports claims that the federal government is retreating from its traditional functions.

## **OVER-BUILDING OF WATERSHEDS**

Canada is one of the world's largest diverters of water for hydropower (Bakker 2007a). The development of water infrastructure tends to be favored as the most viable option by decision makers (Molle 2009). This type of water resource development has contributed immensely to the overbuilding of river basins (Molle 2009). Basin overbuilding motivates powerful decision makers through opportunities of economic incentives (Molle 2009). Politicians cherish iconic large-scale infrastructure as symbolic representations of their success, and to build their constituencies (Molle 2009). Government technical agencies, bureaucracies, and private consulting firms need professional projects to ensure future budgets (Molle 2009). Development banks and corporation agencies view large-scale projects as opportunities to disburse funds (Molle 2009). Basin overbuilding leads to water resources being invariably exploited to a point where systems can no longer fulfill their natural functions (Molle 2009, Bakker and Cook 2011, Booth and Skelton 2011, Place and Hanlon 2011, Brandes and O'Riordan 2014). Fragile fish habitats struggle to maintain necessary temperature, flow, and quality requirements in highly developed basins (Wright and Guimond 2003). Ecological functions in riparian areas decrease with watershed health (Brandes and O'Riordan 2014). Increased water use and contamination associated with development of resource extraction activities jeopardize valuable fresh water sources (Brandes and O'Riordan 2014). Watersheds are unable to cope with the pressures generated by development, which deplete available water leading to a decrease in the overall resiliency of the system (Molle 2009).

Canada's paradigm of supply-management still dominates attitudes in water policy (Bakker 2007a, Brandes et al. 2007, Muldoon and McClenaghan 2007). Supply-management focuses on engineering large centralized infrastructure to control natural processes that meet human needs (Brandes et al. 2007). It is based on the belief that technology and financial costs are the only limiting factor to curbing natural systems to provide eternal services (Brandes et al. 2007). Growth is modeled by past extrapolations that reflect an increase in a higher capacity to meet future needs (Brandes et al. 2007). This type of management supports large engineered projects, and depicts an assumption that water is not a valuable resource (Brandes et al. 2007). Although supply-management has been successful in providing a basis for Canada's economy, it encompasses little incentives for efficiency, conservation and social interests (Brandes et al. 2007, Sprague 2007). A major flaw in the traditional water policy is the neglect of opportunity for the public to engage in water-related decisions of environmental concerns (Muldoon and McClenaghan 2007). There is a current disconnection between decision makers and the local actors on the ground, who are affected by these decisions about water resources.

## BRITISH COLUMBIA'S CURRENT GOVERNANCE INITIATIVES

British Columbia's current governance approach focuses on resource extraction, and is driven by decisions that favor development proposals that follow a minimal process in addressing local community, environment and First Nations (Brandes and O'Riordan 2014). Resource stewardship is not apparent in decisions regarding fresh water, where the decisions tend to be driven by economic values. This is evident in British Columbia's *Land Act*, which primarily focuses on rules for resource extraction (Brandes and O'Riordan 2014). The *Water Act* previously exercised a priority system in which extractive purposes are granted to users based on the sequence in which the application is submitted and neglects to address any ecological or social issues (Brandes and O'Riordan 2014). The further complexity of a top-down governance approach has complicated action on environmental challenges in British Columbia (Bakker 2007a, 2007b, Brandes et al. 2007, Christensen and Lintner 2007, De Loe and Kreutziser 2007, Muldoon and McClenaghan 2007, Nowlan 2007, Sprague 2007, Bakker and Cook 2011, Brandes and O'Riordan 2014). The current system is not serving social, ecological and long-term economic needs through water governance (Bakker 2007a, 2007b, Sprague 2007, Brandes et al. 2007, Christensen and Lintner 2007, De Loe and Kreutziser 2007, Muldoon and McClenaghan 2007, Nowlan 2007, Renzetti 2007, Bakker and Cook 2011, Brandes and O'Riordan 2014). Communities are faced with water challenges like droughts, rapid resource development, and contaminated drinking water (Bakker 2007a, De Loe and Kreutziser 2007, Sprague 2007, Bakker and Cook 2011, Brandes and O'Riordan 2014). The status-quo approach has proven to no longer have the capacity to respond these issues, and citizens are beginning to recognize the need for more direct civic engagement at local watershed scales (Bakker 2007a, Brandes et al. 2007, De Loe and Kreutziser 2007, Bakker and Cook 2011, Brandes and O'Riordan 2014).

Local organizations and non-profit actors are collaborating to fill in the voids where governance is failing. They are seeking more formal roles in decision making at the local watershed scale (Bakker and Cook 2011, Brandes and O'Riordan 2014). A major flaw in the traditional water policy is the neglect of opportunity for the public to engage in water-related decisions (Muldoon and McClenaghan 2007, Bakker and Cook 2011, Brandes and O'Riordan 2014). There is a current disconnect between higher levels of government and local actors on the ground, who are affected by the decisions in resource management. Watershed boards and round tables are becoming a desired solution to collaboration and partnerships that act as a nexus to resource-based decisions (De Loe and Kreutziser 2007, Brandes and O'Riordan 2014). Watershed communities have already established a variety of watershed boards like the Cowichan Watershed Board, Shawnigan Watershed Roundtable, and Okanagan Basin Watershed Board to address specific issues related to their watershed (Brandes and O'Riordan 2014). This is an attempt to address governance issues from a bottom-up approach where communities have a more established and formal role in some of the decisions that are made within their watershed (De Loe and Kreutziser 2007, Brandes and O'Riordan 2014, Hunter et al. 2014). Citizens can voice some of the local interests, and participate in decisions around ecological, economic and social values (De Loe and Kreutziser 2007, Brandes and O'Riordan 2014, Hunter et al. 2014). The scales at which these issues need to be

addressed are at a finer resolution than what is offered by the current government framework. Semi-formal local entities are viewed as a solution to address specific concerns that are unique to watersheds.

### **Water Sustainability Act**

British Columbia has recognized the need for local communities to become more engaged in the decision-making process in water policy, and has delegated select governance responsibilities to local watershed institutions in the newly implemented *Water Sustainability Act* (Brandes and O’Riordan 2014). The *Water Sustainability Act* modernizes the B.C *Water Act*, and was created on the basis of recommendations from a number of diverse groups (Brandes and O’Riordan 2014). First Nations, industry, academia, professional experts, local governments and non-governmental organizations have contributed to the new legislation in the *Water Sustainability Act* (Brandes and O’Riordan 2014). The act attempts to address some of the voids where governance has been lacking, and engage communities more directly in watershed decisions. Management policies focus on protecting stream health, ground water regulation, water allocation, watershed sustainability planning, monitoring and reporting of major water use, and collaborative governance (Brandes and O’Riordan 2014). Social and ecological interests are incorporated in the policies to provide a baseline for sustainable and long-term management of water resources (Brandes and O’Riordan 2014). The act supports a bottom-up approach to watershed management, and aims to coordinate governance approaches throughout a provincial to local level (Brandes and O’Riordan 2014, Hunter et al. 2014). This presents a unique and promising opportunity for local watershed governance in British Columbia.

### **DISCUSSION**

It has become apparent that Canada’s traditional approach to water management will not be viable for much longer, as new sources of fresh water will need to come from existing sources (Brandes et al. 2007). This calls for new and innovative approaches in water management, where citizens are demanding a more direct and civic engagement in water governance. The status-quo of the current top-down approach is not effective or even apparent at the federal level. Canada tends to lean towards subsidiarity with minimal efforts to data gathering, monitoring and enforcement (Bakker and Cook 2011). A major flaw in Canadian policy is the neglect of opportunity for the public to engage in water policy. Provinces like British Columbia have recognized the need for coordination and harmonization between local actors on the ground and governing agencies. Scholars have argued that governance approaches need to shift towards environmental governance (Prudham 2004, Mascarenhas 2007, Reed and Bruyneel 2010). This includes scaling up and down governance hierarchies, back to embrace historical approaches, and out to various social groups to create an effective and robust regime (Reed and Bruyneel 2010). More importantly there needs to be an established connection between local actors on the ground who are directly affected by the decisions in water governance.

Watersheds are incredibly unique in their physical, social, cultural, economic and ecological characteristics. Each of these characteristics presents equal opportunity for specific watershed challenges. The local community of a watershed is not only aware of these challenges, but may have differing views of success in how the watershed should be managed which may strive beyond government driven economic incentives. These can include targets for aquatic species like salmon populations, water quality for drinking, and flow for recreational purposes. Watershed communities are faced with the pressures of resource development basin overbuilding, and overarching routine policy that lacks to acknowledge social and ecological aspects. As a result, these communities are continually struggling to find a balance between ecological, social and economic needs, and this challenge is further exacerbated by the fragmentation in the current governance system. It is clear that an overarching ‘blanket’ policy approach is not effective or efficient in addressing these challenges, and watershed collaboration at a local level is key to defining solutions in watershed management. Whole-system thinking is necessary in community-centered approaches to water governance (Brandes and O’Riordan 2014). The scales at which these challenges need to be addressed are at a local watershed scale. Local governance provides the opportunity to encompass these distinctive watershed traits and steer governance to meet these challenges. Shared governance at a local scale is a critical starting point on the path to sustainable water resource development (Brandes and O’Riordan 2014).

The new *Water Sustainability Act* offers an opportunity for local watershed governance in British Columbia. Watershed organizations have already begun to collaborate and address concerns that governments no longer have the capacity to address in regards to protecting the health and function of local watersheds. Watershed boards and round tables are becoming a desired solution to collaboration and partnerships that act as a nexus to resource-based decisions (De Loe and Kreutziser 2007, Brandes and O’Riordan 2014). Studies have shown that existing local watershed entities struggle with delegated authority, accountability and collaboration (Bakker and Cook 2011, Lautze et al. 2011, Brandes and O’Riordan 2014). The act has incorporated some of these aspects into management policies. Often issues are quite complex, and interrelated across multiple government agencies, department and ministries (Bakker 2007a, Bakker and Cook 2011, Brandes and O’Riordan 2014). Effective governance at a local watershed scale can address specific issues within a watershed from a bottom-up approach where communities have a more established and formal role in some of the decisions that are made within their watershed. Social and ecological considerations can be considered in conjunction with economic values, and aid in providing a baseline for sustainable long-term management of water resources. This opportunity will connect higher levels of government to local actors on the ground, who are affected by the decisions in resource management.

## **CONCLUSION**

Canada’s water crisis is said not to be one of scarcity, but of water governance (Brandes et al. 2007, De Loe and Kreutziser 2007, Lautze et al. 2011, Brandes and O’Riordan 2014). The complexity of a top-down governance approach has complicated

action on environmental challenges in British Columbia (Muldoon and McClenaghan 2007, Bakker and Cook 2011, Brandes and O’Riordan 2014). The current system is not serving social, ecological and long-term economic needs through water governance (Bakker 2007a, 2007b, Sprague 2007, Brandes et al. 2007, Christensen and Lintner 2007, De Loe and Kreutziser 2007, Muldoon and McClenaghan 2007, Nowlan 2007, Renzetti 2007, Bakker and Cook 2011, Brandes and O’Riordan 2014). Supply-management perspectives have dominated water policy through the belief that nature could be shaped to suit the needs of society, and that water was never a limiting factor of growth (Brandes et al. 2007, Sprague 2007). As a result of traditional policy practices, watersheds are unable to cope with the pressures generated by development. Communities are faced with water challenges like droughts, rapid resource development, and contaminated drinking water. It is clear that an overarching ‘blanket’ policy approach is not effective or efficient in addressing these challenges. Watershed collaboration at a local level is key to defining solutions in watershed management. The status-quo approach has proven to no longer have the capacity to respond these issues, and citizens are beginning to recognize the need for more direct civic engagement at local watershed scales. A distributed governance regime is needed to address resource management challenges at a local watershed scale to enact harmonization and liaison between all scalar jurisdictions of governance. British Columbia’s *Water Sustainability Act* presents a valuable opportunity for local watershed governance in British Columbia. Shared governance at a local scale is a critical starting point on the path to sustainable water resource development in British Columbia.

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