
**Towards Sustainable Financing for Watershed Governance in
British Columbia: Tapping into Alternate Revenue Streams**

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EXECUTIVE SUMMARY

INTRODUCTION

British Columbia is on the threshold of a freshwater crisis. Its ecosystem health, water quality, and water quantities are threatened by the effects of pollution, unsustainable consumption, and further exacerbated by extreme weather events associated with climate change. In recent decades, there has been increased attention on the Province's water management approaches and a growing emphasis on collaborative governance at the watershed level. Effective watershed governance is costly. It requires adequate and sustainable financing for its broad range of governance, resource stewardship, infrastructure, and administrative activities.

Beginning in 2010, the Province embarked on a regulatory renewal process to modernize its water legislation. On February 29, 2016, the *Water Act* (1909) was repealed, and the *Water Sustainability Act* (WSA) was brought into force with a series of enabling regulations related to groundwater licensing, minimum environmental flow requirements during seasonal variations or droughts, and a water pricing schedule for provincial water licence rentals and fees.

It is anticipated that in late-2016, the Province will initiate a new round of stakeholder engagement opportunities to develop regulations related to the creation of Water Sustainability Plans, the measurement and reporting of water usage, and the creation of alternative governance structures, which may include delegated decision-making authority to non-governmental watershed organizations.

With the intent of informing the POLIS Project on Ecological Governance – Water Sustainability Project (POLIS) in their policy recommendations for the next round of provincial regulatory consultations, the purpose of this report is to examine sustainable financing options for watershed governance in British Columbia.

METHODS

This report employed a qualitative research approach. The literature review explored existing research on watershed governance, financing of watershed governance, and the current status of watershed governance organizations in British Columbia. The jurisdictional scan examined seven watershed governance organizations from British Columbia, Alberta, Ontario, Nova Scotia, the United States and Europe. It compared how they were financed and the functions they performed. The semi-structured interviews with eight key informants from government, watershed organizations, and non-government organizations explored their perspectives of watershed governance, as well as discussed current and potential sustainable financing options for watershed governance organizations in British Columbia.

FINDINGS

Influenced by the premise that water crises are largely governance crises, the report discussed the contextual variations of watershed governance organizations, their financing options, and ranges of activities. It clarified the revenue sources that are best suited to the types of watershed governance activities, and it illuminated governance models that best employ the various financing options. It further recognized that there is neither a one-size-fits-all approach to

watershed governance models nor any magic bullets, singular templates, or ideal solutions for the sustainable financing of watershed governance.

More specifically, the data from the literature review, jurisdictional scan and key informant interviews indicated that watersheds are the preferred spatial scale for water management and governance functions; and, that watershed-scale decision-making organizations should be established where they do not exist. Watershed governance organizations are unique and are influenced by the aquatic, riparian and terrestrial sub-systems of their hydrological settings, as well as their legislative frameworks, socio-political conditions, administrative structures, institutional capacities, community values, and decision-making processes. Their financing is ultimately derived from three main revenue sources (i.e. taxes, tariffs, and transfers). In turn, their revenue streams support a broad range of functions, which encompass governance, resource stewardship, infrastructure, and administrative activities.

Insecure or insufficient revenue streams for watershed governance organizations are a significant contributing factor to ineffective or failed watershed governance. Mitigation of this funding dilemma requires the establishment of a coherent financing strategy that addresses all financial, economic and environmental costs, and incorporates a diversified mix of financing mechanisms from each of the three revenue sources (i.e. taxes, tariffs, and transfers). The jurisdictional scan demonstrated that the water governance organizations who were heavily reliant on transfers from senior governments and grants from corporate or philanthropic donors had limited financial autonomy and a corresponding limited range of activities; whereas, those who received a significant proportion of their budgets from taxes or tariffs appeared to have both greater operational stability and range of activities.

In examining the current status of British Columbia's water governance framework, the report determined that there are 22 relevant federal, provincial or local government statutes, 189 regional or local governments, 198 First Nations communities, and a multitude of watersheds of varying scales. Of the plethora of existing watershed governance organizations, only two have formal legislated status (i.e. the Okanagan Basin Water Board and the Columbia River Trust), and the remaining have semi-formal or informal status.

The report further established that there is a financing gap for British Columbia's watershed governance organizations. Bridging this gap will require the mobilization of all potential sources of funding. This necessitates an assessment of the economic characteristics of the water-related good, service or resource at hand, applying the polluter pays and user pays principles; and then tailoring the selection of revenue source with the activity such that public funds (i.e. taxes) are used for public or merit goods, and that tariffs are duly charged to water users, beneficiaries or polluters. Notably, no single revenue source or financing mechanism will achieve all stated needs or objectives: it will require a creative combination of financing mechanisms to achieve all requirements.

Finally, the report suggested three specific prospects for tapping into alternate revenue streams for sustainable financing of watershed governance in British Columbia. These opportunities include: (1) increasing the use of existing financing options, (2) implementing financing options in a manner or jurisdiction where they are not currently in use; and, (3) embracing innovative options (i.e. expanding the use of social financing opportunities).

RECOMMENDATIONS

The following recommendations arising from the research are congruent with the OECD's twelve Principles on Water Governance (2015, pp. 9-12). The first two recommendations are directed towards senior and local governments, and the final recommendation is oriented towards POLIS. They underscore that effective watershed governance and sustainable financing of watershed governance organizations are inescapably intertwined, and that neither will be fully realized without water governance and water pricing reforms.

Recommendation 1:

Enable the development of an integrated, collaborative water governance framework that further permits the creation of watershed-scale decision-making bodies with appropriate levels of delegation, even where these organizations transcend existing political or institutional boundaries. This new framework may include creating opportunities for two or more local governments to merge their watershed governance interests, and it may contain standards for consistent inclusion of First Nations and other community stakeholders.

Recommendation 2:

Ensure the mobilization of sufficient financial resources at all levels of government to finance the spectrum of governance, resource stewardship, infrastructure, and administration activities in an efficient and timely manner. This will require the pricing of water as an economic good, the implementation of polluter pays and user pays principles, regularly scheduled reviews of the provincial water pricing rate structures, and earmarking a portion of the new revenue streams to support watershed governance organizations.

Recommendation 3:

POLIS should continue its work in building capacity, particularly in the identification and benchmarking of examples of watershed governance organizations that have implemented innovative watershed governance or financing strategies, and to continue providing training on sustainable water governance practices. As British Columbia's historic drought conditions continue to escalate, there is an urgent need for dialogue in order to share experiences, identify good practices, and develop tools to move forward.

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LIST OF ACRONYMS

3Ts	Taxes, Tariffs, and Transfers
BCCSCD	British Columbia – Ministry of Community Sport and Cultural Development
BCFLNRO	British Columbia – Ministry of Forests, Lands and Natural Resource Operations
BCMOE	British Columbia – Ministry of Environment
BRBC	Bow River Basin Council, Alberta
CA	Conservation Authority
CARP	Clean Annapolis River Project, Nova Scotia
CRP	Cost-Recovery Principle - also known as Beneficiary or User Pays Principle
CSR	Corporate Social Responsibility
DSM	Demand-Side Management
FBC	Fraser Basin Council, British Columbia
FITFIR	First in Time, First in Right
GRCA	Grand River Conservation Authority, Ontario
GWP	Global Water Partnership
HvR	Hoogheemraadschap van Rijnland, Netherlands
IBT	Increasing Block Tariffs
INBO	International Network of Basin Organizations
IWRM	Integrated Water Resource Management
LWS	Living Water Smart: British Columbia’s Water Plan
MEVA	Municipalities Enabling and Validating Act
NGOs	Non-Governmental Organizations
NRC	Nisqually River Council, Washington
NRTEE	National Round Table on the Environment and Economy
OECD	Organization for Economic Co-Operation and Development
OBWB	Okanagan Basin Water Board, British Columbia
PES	Payments for Environmental Services
POLIS - WSP	POLIS - Water Sustainability Project, Centre for Global Studies, UVIC
PPP	Polluter Pays Principle
PPP or P3s	Public-Private Partnerships
PSAB	Public Sector Accounting Board, Canada
RBO	River Basin Organizations
RLF	Revolving Loan Funds
RDN	Regional District of Nanaimo, British Columbia
SSM	Supply-Side Management
UBCM	Union of British Columbia Municipalities
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPP	User Pays Principle
WAM	Water Act Modernization
WFD	European Union Water Framework Directive
WPACs	Watershed Planning and Advisory Councils, Alberta
WSA	Water Sustainability Act
WSP	Water Sustainability Plan

1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

British Columbia is on the threshold of a freshwater crisis. Ecosystem health, water quality, and water quantity are threatened by the effects of unsustainable consumption, pollution, extreme weather events, and climate change (British Columbia Ministry of Environment [BCMOE], 2008, p. 41; Brandes & Curran, 2009, p. 1; Brandes & Morris, 2016, p. 1). In recent decades, there has been increased attention on the Province’s water management approaches and growing emphasis on collaborative governance at the watershed level (Brandes, O’Riordan, O’Riordan & Brandes, 2014, p. vii; Nowlan & Bakker, 2007, p. 10). Effective watershed governance requires sufficient long-term financing to address the broad range of functions related to governance, resource stewardship, as well as infrastructure construction, maintenance and operations (Kenney, 2000, p. 4; Leach & Pelkey, 2001, p. 378; Morris & Brandes, 2013, p. 28; Nowlan & Bakker, 2007, p. 37; Nowlan & Bakker, 2010, p. 34; OECD, 2012a, p. 43; OECD, 2012b, p. 75; OECD 2015, p.10). In the current era of public sector fiscal restraints, watershed governance organizations must access a range of revenue streams to finance their activities.¹

The purpose of this report is to summarize the results of a research project to identify potential financing options that can be implemented to sustain watershed governance organizations in British Columbia. The research explored types of watershed governance organizations and revenue sources available for financing their activities. A comparative analysis of the application of funding arrangements in other jurisdictions was conducted. A synthesis of the emergent learning in the field of watershed governance financing was undertaken. The report includes policy proposals suitable for implementation in British Columbia, and makes recommendations to the client.

1.2 BACKGROUND

The client for this report is Oliver Brandes, Co-Director and Project Lead of the POLIS Water Sustainability Project. Formed in 2003 and located at the Centre for Global Studies, University of Victoria, the POLIS Water Sustainability Project (WSP) promotes the development of innovative watershed governance practices that include “conservation, stewardship, and sustainability” (POLIS-WSP, 2014, para 3). The intent of this report is to support the client’s ongoing research in public policy development and sustainable watershed governance practices.

This inquiry is timely as British Columbia is modernizing its water policy framework. On February 29, 2016, the historic *Water Act* (1909) was repealed, and the *Water Sustainability Act* (WSA) along with a preliminary series of enabling regulations was brought into force. Further consultations and policy development for the remaining regulations, including those related to alternative governance approaches, are expected to commence later in 2016 (BCMOE, n.d.b., para 9).

It is hoped that this report will add to the rapidly evolving body of knowledge in this field. First, the report should contribute to the dialogue between stakeholders, policy-makers, and elected government officials who have an interest in developing viable watershed governance models.

¹ The phrase watershed governance organization is used throughout this report as a generic reference to identify various formal or informal entities responsible for governance decisions at the watershed level.

Second, it should identify financing strategies that may be adapted to meet diverse regional requirements and will be of future benefit to watershed governance organizations across British Columbia.

1.3 ORGANIZATION OF REPORT

Following this Introduction, the remainder of this report contains eight sections and is organized as follows. The second section presents an overview of the qualitative research methodologies used in the production of this report, as well as limitations and delimitations of these approaches. Section three contains the literature review, which summarizes existing research on watershed governance, financing water governance, and British Columbia's water law framework. Section four illustrates the conceptual framework used to address the research objective. Sections five and six detail the findings from the jurisdictional scan and key informant interviews respectively. Section seven discusses these findings. Section eight makes recommendations towards the development of sustainable financing for watershed governance in British Columbia. Section nine concludes the report and suggests areas for further research.

2.0 METHODOLOGY

2.1 INTRODUCTION

The purpose of this report is to identify potential financing options that can be implemented to sustain watershed governance organizations in British Columbia. Accordingly, a qualitative research approach was used to achieve the following objectives: identify examples of watershed governance organizations from British Columbia, Canada and internationally; identify characteristics of their governance and financial frameworks; catalogue potential financing options and the corresponding range of watershed governance activities; and, make recommendations to move the discussion regarding sustainable financing of watershed governance organizations forward in British Columbia. Methodologies for this report include a review of the academic and gray literature, a jurisdictional scan using a comparative case study approach, and semi-structured key informant interviews.

This section discusses the methodologies utilized in the production of this report. The first subsection describes the techniques used to compile the resources for the literature review. The second subsection reviews the process used in selecting and analyzing case studies for the jurisdictional scan. The third subsection explores the procedures utilized for the key informant interviews. The fourth subsection discusses limitations and delimitations of this research approach.

2.2 LITERATURE REVIEW

A literature review was conducted to provide an overview of key concepts in sustainable financing of watershed governance organizations. The process for the literature review included several steps. First, searches of Google, Google Scholar, and other academic databases were conducted to identify pertinent resources using keywords such as: ‘catchment’, ‘drainage basin’, ‘river basin’, ‘watershed’, ‘governance’, ‘funding’, ‘finance(s)’, ‘financing’, ‘sustainable financing OR funding’, and ‘innovative financing OR funding’. Second, advanced searches using the bibliographies of the preliminary materials yielded additional relevant publications. Third, targeted internet searches pointed to books, journal articles, websites, local government documents, conference proceedings, and reports published by non-government organizations. Finally, these results were filtered by subject relevance and by date. Due to the rapid growth of knowledge in this policy area, preference was given to materials produced in the past two decades. The literature review also provided an overview of British Columbia’s legislative framework for water governance, and addresses the replacement of the *Water Act* (1909) with the *Water Sustainability Act* on February 29, 2016. The results of the literature review are presented in Section 3, and the conceptual framework is described in Section 4.

2.3 JURISDICTIONAL SCAN

Comparing case studies is a common research approach used to examine similarities or variances between one or more phenomena and then used to draw inferences for application in other contexts (Blatter, 2008, p. 68; Mills, 2008, p. 103). A jurisdictional scan was completed to identify examples of watershed governance organizations from British Columbia, other Canadian provinces, and international jurisdictions. A comparative analysis was conducted to distinguish

the characteristics of these governance bodies: how they function, how they are financed, and what activities they undertake.

Watershed governance organizations are products of their unique situations and are shaped by numerous factors including hydrological settings, legislative frameworks, socio-political environments, administrative structures, institutional capacities, and decision-making processes (Rees, Winpenny & Hall, 2008, p. 11). Consequently, there are many types of watershed organizations as well as considerable variability in their forms and functions (Hooper, 2006, p. 24). In recent decades, several typologies have been developed to describe and better understand their multifactorial characteristics.² Of these, Hooper's typology of nine river basin organizations (RBOs) was chosen as the analytical framework to assess the case study watershed organizations and is summarized in Table 1.

In order to select the watershed governance organizations for the jurisdictional scan, the following criteria were used. First, the range of potential watershed governance organizations was informed by the literature review. The client's own research and others from British Columbia provided an array of examples (Brandes & Curran, 2009, p. 3; Brandes et al., 2014, pp. 32 – 35; Fraser Basin Council [FBC], 2015, pp. 30-40; Morris & Brandes, 2013, p. 32; Nowlan & Bakker, 2007, p. 31). Second, the representativeness of potential watershed governance organizations in terms of their physical characteristics, legislative framework, governance structure, and range of financial instruments used to fund their activities was considered. Third, Hooper's typology of nine forms of river basin organizations (2005, pp. 26-39; 2006, pp. 24-28) was used to filter the preliminary results, with a focus on the five more commonly appearing governance forms within countries such as advisory committees, authorities, associations, councils, and corporations. Examples of the remaining categories (i.e. commissions, tribunals, trusts, and federations) were excluded on the basis of the client's direction, since they often involved unique circumstances (i.e. the 1100-year old Valencia Water Tribunal) or transboundary arrangements (i.e. Murray–Darling Basin Commission, Columbia Basin Trust, or the European Union's Water Framework Directive), and had limited usefulness for replication within British Columbia at this time. Fourth, the client requested that case studies include examples from British Columbia, across Canada, and overseas. As a result, geographical distribution was used to refine the candidate organizations. Finally, preference was given to watershed governance organizations where relevant data was readily accessible from their websites including self-published reports such as strategic plans and annual performance reports.

As a result of this selection process, seven watershed governance organizations were identified. From British Columbia, the Regional District of Nanaimo (RDN) and the Okanagan Basin Water Board (OBWB) were chosen. Examples from across Canada included Alberta's Bow River Basin Council (BRBC), Ontario's Grand River Conservation Authority (GRCA), and Nova Scotia's Clean Annapolis River Project (CARP). The international examples included the Nisqually River Council (NRC) in Washington State, and the Hoogheemraadschap van Rijnland (HvR) Regional Water Authority in the Netherlands.

The findings from each of the seven case studies include information on the following categories: their geographical context, the impetus for their formation, their governance structure, the scope of their mandate, and the types of financing options that are used to fulfill their range of activities. The results of the jurisdictional scan are presented in Section 5.

² The literature review contains an overview of watershed governance typologies.

Table 1 Hooper's Typology of Watershed Organizations

Type	Description
Advisory Committee	A formalized or quasi-formal organization in which individuals take responsibility for undertaking action planning and provide advice; governments 'hand over' strategic planning to such organizations; they frequently have no or limited legal jurisdiction.
Authority	An organization which makes planning decisions at a central or regional government level; may set and enact regulations, or have development consent authority; authorities are founded on democratic principles and a framework of law to which all relevant individuals and institutions are subject to in a basin setting.
Association	Similar to an Advisory Committee, this is an organization of like-minded individuals and groups with a common interest. In a river basin, they have varying roles: providing advice, stimulating basin awareness, education, and ownership of basin natural resources management issues; educational functions and information exchange.
Commission	An organization that is delegated to consider natural resources management matters and/or takes action on those matters. A basin commission's powers vary and include advisory /education roles, monitoring roles, undertaking works, fulfilling goals of a specific government's charter or an international agreement. Commissions normally are instituted by a formal statement of a command or injunction by the government to manage land and water resources; commissions may also have regulatory powers.
Council	A formal group of experts, government ministers, politicians, NGOs and lay people brought together on a regular basis to debate matters within their sphere of basin management expertise, and with advisory powers to government. A council is contrasted with a commission which, although also a body of experts, is typically given regulatory powers in addition to a role as advisor to the government.
Corporation	A legal entity, created by legislation, which permits a group of people, as shareholders (for-profit) or members (non-profit) to create an organization. It can focus on pursuing set objectives, is empowered with legal rights which are usually reserved for individuals, can sue or be sued, own property, hire employees, loan and borrow money.
Tribunal	A basin entity that has formalized procedures and quasi-judicial powers; a heavy emphasis on bureaucratic decision-making; stakeholders may formally participate in hearings; major decisions are taken by independent bodies, like a water pricing tribunal. These entities have limited traditional powers of civil government and do not report to other government agencies, except where a local government body may oversee entities such as 'country' drainage districts, which charges for water.
Trust	A trust is a legal device used to set aside money or property of one person for the benefit of one or more persons or organizations. It is an organization that undertakes river basin works; develops and implements a strategic plan; its mandate is to be the river basin 'advocate'; it coordinates local programs through Memoranda of Understanding or other agreements; it raises local levies (funds) for its works and programs. A Trust keeps monies raised in 'trust' for the benefits of its citizens.
Federation	A collaboration of organizations or departments within one government or between state and national governments to establish and undertake actions for river basin management. Governance actions at various levels (national, state and local) include agreements on water sharing, water quality management, shared statements of intent; policy development; information exchange; joint actions for management of ecosystem degradation. Collaboration is expressed in terms of framework directives, cost-sharing arrangements, joint statements of intent, partnerships, joint programs, and policy.

Source: Adapted from Hooper, 2005, pp. 26-39; Hooper, 2006, pp. 24 – 28.

2.4 KEY INFORMANT INTERVIEWS

The intent of the key informant interviews was to augment the findings obtained in the literature review and the jurisdictional scan; and, to hear the personal insights of subject-matter experts from the field of watershed governance as related to the BC-specific context.³ As illustrated in Table 2, the design of the semi-structured interview questionnaire was guided by the research objective and informed by the literature review. First, the participants were asked their views on watershed governance and sustainable financing of watershed governance. Next, it explored their perspectives on financing options currently in use for watershed governance in British Columbia, along with corresponding successes and challenges of these mechanisms. Finally, it invited dialogue on potential options for sustainable financing of watershed governance in British Columbia.

Table 2 Design of Semi-Structured Interview Guide

Research Objective: To identify sustainable financing options for watershed governance in British Columbia.	
Link to Literature Review	Interview Questions
Blomquist & Schlager, 2005 Gupta et al., 2013 Hooper, 2005 Molle, 2009	What does the term ‘watershed governance’ mean to you?
Kenney, 2000 Leach & Pelkey, 2001 Rees, Winpenny & Hall, 2008	What does the phrase ‘sustainable financing of watershed governance’ mean to you?
Hurd, 2009 Nowlan & Bakker, 2007 OECD, 2009 OECD, 2012 Rees, Winpenny & Hall, 2008 Stanton, Flores & Batker, 2014	There are a variety of funding options available to sustain watershed governance. Please describe the financing methods that you are familiar with. <ul style="list-style-type: none"> • Where have you seen these financing methods implemented? • What were the results? • In what ways were they successes/challenges?
Brandes & Curran, 2009 Brandes et al., 2014 Morris & Brandes, 2013 Nowlan & Bakker, 2007	In your opinion, of the various watershed governance financing options available, which do you believe would be the most appropriate for implementation in British Columbia? <ul style="list-style-type: none"> • Please elaborate on what you believe needs to be changed to accomplish this. • What would the key barriers be to accomplishing this?
Baltutis et al., 2014 Brandes et al., 2014 Fraser Basin Council, 2015 Morris, 2014	In your opinion, what does British Columbia need to be doing in order to be considered a world leader in sustainable financing for watershed governance?

³ Creswell and Miller (2000, p. 126) indicate that one method for improving the validity of a qualitative study is through triangulation of data from different sources to identify theme convergences.

A preliminary list of 28 potential interview participants was identified through the literature review, jurisdictional scan, and in consultation with the client and academic supervisor. These individuals were from British Columbia, other Canadian provinces, and international jurisdictions. They were recognized for their direct experience and expertise in either sustainable watershed financing, asset management, or infrastructure financing. They included: elected officials, local or senior government staff, chairs / past chairs/ vice chairs or executive directors of watershed governance organizations, as well as subject-matter experts from non-government organizations and academia. The desired number of interviewees was between eight to twelve participants.⁴ In order to recruit potential participants, and also to protect their privacy and confidentiality, only business email addresses obtained from publicly available websites or online directories were used.

Recruitment of potential research participants commenced after the University of Victoria's Human Research Ethics Board issued Ethics Protocol #15-104 on April 24, 2015, and approved the overall process, interview questions, and Participant Consent form. The recruitment phase consisted of three waves of emailed invitations (Appendix A). Each recruitment email included two attachments: the Participant Consent Form (Appendix B), and the Semi-Structured Interview Guide (Appendix C).

In total, 20 individuals were contacted from the initial list of 28 potential interviewees. Participants were selected on a first-received response basis. To prevent duplication of data, once there had been a positive response and a completed interview from an organization, further participants from that same organization were not contacted.

Of the 20 potential interview participants who were contacted, eight persons ($n=8$) completed the interview process, representing a response rate of 40%. The remaining individuals were either: interested but unavailable ($n=2$), declined with thanks ($n=3$), or did not respond to the emailed invitation to participate ($n=7$).

Interviews with the eight key informants were conducted by phone at mutually convenient times. The introductory section of the interviews included a review of the Participant Consent form, established the informed consent of the participant, and confirmed permission for the researcher to digitally record the interview. To protect the anonymity of each participant, at the commencement of their interview they were assigned the initials WG and a single digit identifier representing the sequence number of their interview (i.e. WG1, WG2). Appendix D lists the participants' interview codes by sector: government, watershed organization, or non-government organization / other.

The eight interviews ranged between 32 – 60 minutes in duration and the average length was 44 minutes. All interviews were recorded and transcribed by the researcher using 'Dragon Naturally Speaking – Premium Version' speech recognition software. The researcher reviewed the transcriptions for punctuation, and any phrase duplications or pauses were removed. This process

⁴ Guest, Bunce and Johnson (2006, pp. 78-79) indicate that when using purposive sampling where participants are relatively homogenous and the research topic is narrow and clearly defined, the completion of six interviews is sufficient to discern useful meta-themes, and that data saturation occurs by the twelfth interview. Similarly, Kvale and Brinkman (2009, p. 113) indicate that interview studies commonly have "15 +/-10" interviews, and that the final number will be dependent on the combination of available resources and the "law of diminishing returns (beyond a certain point, adding more respondents will yield less and less new knowledge)."

was supplemented by field notes taken by the researcher during the interviews. These notes helped with understanding any partially inaudible comments or acronyms. In places where there were clarifying questions and ensuing dialogue, discretion was applied, and those sections were paraphrased. In total, over six hours of digital recordings were transcribed and resulted in 57 pages of typed comments.

Participants were provided with their draft interview record. They were advised that it was not a verbatim transcript and were asked to review their draft narrative for completeness and accuracy. They were also invited to incorporate clarifications or additional comments that had not been specifically addressed during their interview. All eight participants completed this member-check process, and their finalized transcripts were used in the next stage of the research.⁵

A thematic content analysis process (Anderson, 2007, pp. 2-3) was used to assess the eight finalized interview records. The participant's responses for each of the interview questions, represented solely by their interview sequence number (i.e. WG1, WG2) were exported from their respective Microsoft Word documents and merged into a Microsoft Excel spreadsheet. Using highlighting features in Excel, the anonymized interview data was reviewed for themes and grouped into categories. The process was repeated, and the second round of theming resulted in similar, more condensed sets of groupings. The results of the key informant interviews are presented in Section 6.

2.5 LIMITATIONS AND DELIMITATIONS

Potential limitations of this research associated with the key informant interviews include the following. First, the purposive sampling selection criteria related to subject-matter expertise or leadership positions within watershed organizations immediately limited the pool of potential participants. Second, time and resources constraints limited the overall number of key informants invited to participate in the interview process. Third, self-selection to participate or not participate in the interview process created the potential for representation bias in that those who volunteered may have had consistently different characteristics or perspectives than those who did not volunteer. Fourth, the level to which key informants felt comfortable sharing their viewpoints and recommendations may have influenced their responses. These are common drawbacks of key informant interviews. They are noted here for their bias potential and overall risks to the external and internal validity of the research (Trochim & Donnelly, 2008, pp. 49 – 51 & 168 - 170).

Further, common limitations associated with semi-structured interviews include the inherent subjectivity of the transcription process itself; and particularly, the use of paraphrased transcripts rather than verbatim transcripts in the theming of interview data (Kvale & Brinkman, 2009, p. 180). The interpretation of audio recordings into written text is recognized as an analytic, constructivist activity, which may be influenced by the researcher's priorities, and by extension, may also affect the research findings (pp. 183–187).

To mitigate the above limitations, several strategies were used to improve the overall validity and reliability of the research results. These included the use of triangulation of data results from the methodology streams to improve the understanding of the theme convergences. Also, the use

⁵ Cresswell and Miller (2000, p. 127) indicate that engaging research participants in a member-check process to confirm their interview data is critically important for verifying the credibility of the resulting interpretations and improves the overall validity of the qualitative study.

of speech recognition software, handwritten field notes, and the vetting of interview records by the participants before utilization in the thematic analysis process enhanced the interpretation of the voice recordings.

A delimitation of this report is that, on the basis of the client's direction, it does not include case studies from four categories listed in Hooper's typology of river basin organizations (2005, pp. 26-39; 2006, pp. 24-28). Examples of tribunals, commissions, trusts, or federations were specifically excluded due to their unique circumstances or presence of transboundary arrangements, and their limited usefulness for replication within British Columbia at this time.

A second delimitation of this report is that it does not make an assessment of the efficacy of the various types of watershed governance organizations.

A third delimitation of this report is that it does not include recommendations about the implementation of specific types of taxes or tariffs (i.e. property taxes, parcel taxes, water licence fees, water or wastewater surcharges, or permit fees), nor does it propose rate structures for these potential revenue instruments.

A fourth delimitation of this report is that it does not address the possible use of water markets or tradable water permits since the Government of British Columbia has specifically indicated that it has no intention of implementing either of these financing options (BCMOE, 2013, p. 95).

3.0 LITERATURE REVIEW

3.1 INTRODUCTION

The literature review explores key concepts related to watershed governance, financing watershed governance, and British Columbia's legislative framework for water governance. Using the methodology outlined in Section 2.2, the literature review process included relevant keyword searches in Google, Google Scholar, and academic databases. Next, advanced searches using the bibliographies of materials obtained in the preliminary round yielded additional publications. Lastly, targeted searches produced gray literature from websites, government documents, conference proceedings, and reports from non-governmental organizations. The results were filtered by subject, and due to the rapid growth of knowledge in this policy area, preference was given to publication dates within the past two decades.

The literature review is divided into the following three subsections. The first subsection examines watershed governance and contains sub-themes related to watershed scale, watershed governance models, and principles of effective water governance. The second subsection discusses the economic properties of water, principles of financing water policy, and lists financing options for watershed governance along with selection criteria. The third subsection provides an overview of the legislative context for water governance in British Columbia and addresses the replacement of the historic *Water Act* (1909) with the enactment of the *Water Sustainability Act* on February 29, 2016.

3.2 DEFINING WATERSHED GOVERNANCE

Watershed governance is informed by several concepts including watershed scale, governance models, principles of water governance, and barriers to effective water governance. These topics are addressed in the subsections below.

3.2.1 WATERSHED SCALE

The terms watershed, drainage basin, river basin, or catchment basin are used interchangeably throughout the literature. Molle (2009, p. 484) indicates that the variations in usage may be accounted for by country of origin, or by the relative size of the basin. In North America, smaller areas (i.e. less than 1000 square kilometres) are typically referred to as watersheds, while their larger counterparts are called basins. In Europe and the United Kingdom, the term catchment basin is used more frequently. Collectively, these geographical terms relate to the bounded area of land that drains all rainfall, surface water, and groundwater within its limits into a common body of water such as a sea, inland lake, or larger river (Blomquist & Schlager, 1999, p. 2; Molle, 2009, p. 484). Within these hydro-geographical boundaries, watersheds are comprised of complex, interdependent aquatic, riparian, and terrestrial sub-systems that filter water, absorb carbon dioxide, and support multiple species (Blomquist & Schlager, 2005, p. 104; Brandes, Ferguson, M'Gonigle & Sandborn, 2005, p. 87; Hooper, 2005, p. 25).

A well-established theme in the literature considers watersheds to be the preferred spatial scale for water management and governance functions. While early Mesopotamian, Chinese, Egyptian, and Roman civilizations demonstrated sophisticated understanding of river systems and the hydrological cycle, it is the 18th century French cartographer Phillippe Buache who is first

credited with introducing the watershed as the logical unit of management in Western literature (Hooper, 2005, p. 24; Molle, 2009, p. 485; Pahl-Wostl, Gupta, & Petry, 2008, p. 419).

Consistent with the hydraulic mission paradigm that was prevalent in the late 19th and early 20th centuries, watersheds were systematically harnessed “to fuel economic development” (Sabatier et al., 2005, p. 26) for such activities as hydroelectric generation, industrialization, irrigation, land reclamation, flood protection, and navigation (Gupta et al., 2013, p. 1; Molle, 2009, pp. 486-489). Beginning in the mid-20th century, growing concerns with the overexploitation of water resources, increased environmental degradation, and declining water quality saw the emergence of the Integrated Water Resource Management (IWRM) paradigm, which advocated balancing human behaviours with environmental needs through increased stakeholder involvement and a holistic approach to decision-making focused at the watershed level (Gupta et al., 2013, p. 1; Hooper, 2005, pp. 3-4; Millennium Ecosystem Assessment, 2003, p. 188; Molle, 2009, p. 490).

By the early-1990s, IWRM concepts had gained wide acceptance as a means of ensuring “equitable, economically sound, and environmentally sustainable management of water resources and provision of water services” (Rogers & Hall, 2003, p. 4). Emerging from the 1992 International Conference on Water and the Environment, the ‘Dublin Statement on Water and Sustainable Development’ is recognized as a landmark document for acknowledging the IWRM approach and for shaping future global perspectives on watershed governance (Winpenny, 2003, p. 1; Larsen, 2000, p. 13). The Dublin Principles declared that:

1. “Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment,
2. Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels,
3. Women play a central part in the provision, management and safeguarding of water, and
4. Water has an economic value in all its competing uses and should be recognized as an economic good” (United Nations [UN], 1992, Section 2, paras 1-5).

In 2000, the European Union’s Water Framework Directive (WFD) recognized the river basin as the cornerstone of its policy structure (Molle, 2009, p. 491; Rees et al., 2008, p. 32); and, in 2003, the Organization for Economic Co-Operation and Development (OECD) promoted the utilization of a ‘whole basin’ integrated approach to water management (OECD, 2003, p. 42).

Blomquist and Schlager (2005) encourage the creation of watershed-scale decision-making organizations where they do not already exist (p. 101) but identify several challenges to this approach. First, the nested nature of watersheds ranging from sub-watershed to supra-watershed levels imply a range of potential boundary options; and, the selection of which boundaries to use is a mix of both scientific and political decisions (p. 105). Second, hydrographical boundaries are often mismatched with jurisdictional or institutional boundaries (Blomquist & Schlager, 2005, p. 102; Imperial, 2005, p. 283; Molle, 2009, p. 491; OECD, 2011, pp. 31-32). Third, the consensus-based, collaborative decision-making processes within watershed-scale organizations by elected officials and non-elected experts may create accountability dilemmas related to the lack of answerability or responsiveness to persons living or working within the watershed (Blomquist & Schlager, 2005, pp. 106-108; Cohen & Davidson, 2011, pp. 3-4).

3.2.2 WATERSHED GOVERNANCE MODELS

Watershed governance organizations are defined as the formal or informal societal entities that are “created to manage, develop, or monitor natural water resources in a large watershed”

(Hooper, 2006, p. 24). They are products of the unique relationships between their exogenous and endogenous contextual circumstances, and they exhibit considerable variability in their forms and functional scope (Hooper, 2006, p. 24; Rees et al., 2008, p. 11). Their development is shaped by the geomorphology of the watershed as well as the historical, cultural, social, spiritual, political and legal traditions of the region (Hunter, Brandes, Moore, & Brandes, 2014, p. 1; United Nations Environment Programme [UNEP], 2014, p. 12). While typically established to address one or two specific challenges, their mandated scope often evolved over time such that many of the organizations that were formed in the mid-20th century for water management or infrastructure development purposes (i.e. flood control, navigable waterways, hydroelectric generation, or delivery of potable water) transitioned in recent decades to accrue functions related to resource stewardship, environmental protection, and sustainable development (i.e. conflict resolution, data collection, education, mapping, monitoring, and planning) (Genskow & Born, 2006, p. 56; Global Water Partnership & International Network of Basin Organizations [GWP & INBO], 2009, pp. 33, 37, 47-49; Hooper, 2006, p. 24; Millington, Olson, & McMillan, 2006, p. 11; UNEP, 2014, p. 12). Watershed governance organizations display a patchwork quilt of administrative structures, institutional capacities, and varying levels of delegated decision-making and stakeholder participation (GWP & INBO, 2009, pp. 33-34; Hooper, 2005, pp. 26-28; Kenney, McAllister, Caile, & Peckham, 2000, p. xii; UNEP, 2014, pp. 11-12).

The broad acceptance of IWRM principles along with increased attention on creating watershed-scale organizations has yielded several typologies of watershed governance models and assessments of their institutional designs (Huitema & Meijerink, 2012, p. 13). From an examination of river basin management systems in five European countries, Mostert (1998) identified three archetypal models of watershed organizations (i.e. hydrological, administrative, and coordinating) based on the respective degrees of planning and coordination of activities, and whether or not these activities occurred within hydrological boundaries (pp. 8-9). Alaerts (1999) noted that “the terminology for naming basin agencies can be misleading” (p. 13); and, through an examination of basin functions distinguished three types of governance organizations such that ‘secretariats’ engaged in policy development and planning activities, ‘authorities’ played a role in infrastructure and water operations, and ‘others’ served as coordinators between technical departments in central government organizations (p. 13). Hooper’s (2005) analysis of river basin organizations based on their legal mandates and prescribed functions delivered a detailed typology of nine basin types including advisory committees, authorities, associations, commissions, councils, corporations, tribunals, trusts, and federations (pp. 28–39), although it has been criticized for potential overlaps between these categories (Huitema & Meijerink, 2012, p. 14).⁶ Some later typologies have re-purposed Hooper’s framework. For example, Millington, Olson, and McMillan (2006, pp. 7-9) described three categories based on a continuum of power relationships among stakeholders (i.e. committees/councils, commissions, and authorities); and, the United Nations Environment Programme (UNEP, 2014, pp. 11-12) combined Hooper’s typology with Huitema and Meijerink’s work (2012, pp. 10–18), which is itself based on an adaptation of Elinor Ostrom’s Institutional Analysis and Development Framework. Finally, other typologies have focused on the effectiveness of decentralized decision-making (Dinar et al., 2005); the distribution of delegated decision-making powers against the degree of participation of government and non-government stakeholders (Nowlan & Bakker, 2007); and, the attributes of collaborative decision-making partnerships (Diaz-Kope & Miller-Stevens, 2015).

⁶ Table 1 in Section 2.3 contains a description of Hooper’s nine river basin organizations.

3.2.3 WATER GOVERNANCE PRINCIPLES

There is recognition that ‘water crises are largely governance crises’ (Gupta et al., 2013, p. 4; OECD, 2011, p. 17; Pahl-Wostl, 2009, p. 354; Rogers & Hall, 2003, p. 15; Winpenny, 2003, p. 9). Healthy watersheds are essential for environmental well-being, vital to human survival, and fundamental to economic growth. There is heightened awareness that water quality, water quantity, and ecosystem health are stressed by increased urban, agricultural, and industrial demands, and that they are further strained by extreme weather events associated with climate change (Millennium Ecosystem Assessment, 2003, pp. 167-168). Mitigation of these dilemmas requires effective water governance involving integrated, collaborative decision-making by governments and a broad range of stakeholders at the watershed level (Brandes & Morris, 2016, pp. 41-42; Nowlan & Bakker, 2007, pp. 15-16; Pahl-Wostl, 2009, p. 363; Robins, 2007, pp. 4-5).

Water governance is broadly described as “the processes and institutions through which decisions are made about water” (National Round Table on the Environment and the Economy [NRTEE], 2011, p. 118). More specifically, it is defined as “the range of political, social, economic and administrative systems that are in place to regulate the development and management of water resources and provisions of water services at different levels of society” (UNDP, 2000 as cited in Pahl-Wostl, 2009, p. 355; Rogers & Hall, 2003, p. 16). Nowlan and Bakker (2007, p. 5) allow for the inclusion of non-state actors by describing water governance as the spectrum of activities “through which interests are articulated, input is absorbed, decisions are made and implemented, and decision makers are held accountable”; and notably, they define watershed governance as encompassing all aspects of water delivery including the entire range of protection and conservation services in the aquatic, riparian and terrestrial ecosystems.

Water governance is distinct from water management, which refers to the operationalization of governance decisions regarding water allocation and utilization (NRTEE, 2011, p. 118; Nowlan & Bakker, 2007, p. 5). The literature describes the evolution of water management frameworks along a continuum from supply-side management (SSM), to demand-side management (DSM), and finally to ‘soft-path’ approaches. Supply-side water management is characterized as “reliance on finding new sources of supply to address perceived new demands” (Gleick, 2000, p. 127). It favours technological solutions and the creation of built infrastructure (i.e. dams and reservoirs) to address increasing populations, rising living standards, and the growing use of agricultural irrigation systems (p. 128). In contrast, demand-side management recognizes water scarcity, promotes efficiencies (i.e. low-flow toilets and drip irrigation), penalizes waste, and prefers education strategies to reduce water consumption (p. 129). Lastly, ‘soft-path’ approaches are long-term, proactive strategies that focus on conservation, innovation, address water needed for ecological processes, and describe a “desired sustainable future state and then backcast[s] to devise a feasible and desirable path to that future” (Brandes et al., 2005, p. 7; Brandes & Brooks, 2006, pp. 9-13). While water governance and management are integrally related, it is noted: “that governance alone cannot correct inadequate water management, but poor governance will almost certainly prevent effective management” (Brandes & Curran, 2009, p. 5).

Gupta (2009) indicated that the dominant discourses in water governance in recent decades have centered on the following topics: a shift from government to governance; good governance; decentralization; and, subsidiarity along with the rising influence of non-state actors through increased stakeholder participation (pp. 43-46).

Coincidental with the shift away from the hydraulic mission paradigm towards the IWRM paradigm during the latter part of the 20th century, a similar change occurred in terminology with a move away from government towards an increased emphasis on governance (Bakker & Cook, 2011, p. 278; de Loë, Armitage, Plummer, Davidson & Morau, 2009, p. iii). This has paralleled the deterioration of the central state's ability to govern due to the combined effects of globalization, market deregulation, fiscal crises at the national and international levels, increased demands of major cities, reduced ability to raise taxes, and leaner government bureaucracies (Rogers & Hall, 2003, pp. 11–12). There is recognition that senior governments are “in retreat” (Morris & Brandes, 2013, p. 27); and, they are “no longer the single decision-making authority” (Pahl-Wostl et al., 2008, p. 423). Also, Graham, Amos, and Plumptre (2003, p. 1) indicated that government is not equivalent to governance. Where the term government is reflective of hierarchical decision-making that is focused on management, governance speaks to multi-level, collaborative, non-hierarchical government “involving less institutionalized processes where social actors and networks [have] a significant role to play” (Gupta, 2009, p. 45).

Governance is described as the process of decision-making. These activities include how decision-makers are selected, how stakeholders are heard, and how decisions are implemented (Brandes & Brandes, 2014, p. 13; Graham et al., 2003, p. 1). Rogers and Hall (2003, p. 4) asserted that governance is more inclusive than government in that it “involves mediating behaviour via values, norms, [and] laws” and addresses the overlaps between political, economic, and technical spheres. Imperial (2005, p. 282) also defined governance as “the means for achieving direction, control, and coordination of individuals and organizations with varying degrees of autonomy to advance joint objectives”.

Good governance is based on the following principles: ‘legitimacy and voice’, which focusses on the participation and consensus orientation of stakeholders; ‘direction’, which addresses the strategic vision of the governance entity; ‘performance’, which reflects the responsiveness, effectiveness and efficiency of the governance entity; ‘accountability’, which speaks to transparency and answerability in the decision-making processes; and, ‘fairness’, which emphasizes equity and respect for the rule of law (United Nations Development Program [UNDP], 1997 as cited in Graham et al., 2003, p. 3).

Decentralization is seen both as an acknowledgement that the political and economic decision-making powers of the state are diminishing, and as a realization that finding solutions to wicked, complex policy issues can no “longer be confined to a few line agencies or to the highest political authorities” (Molle, 2009, p. 491). Further, Gupta (2009, p. 46) indicated that decentralization is an opportunity to “deepen democracy by bringing governance closer to the governed” and, that it promotes efficiency by allowing for “the incorporation of stakeholder knowledge and accountability to local communities.”

Recent demands for increased stakeholder participation, including non-state actors, are compatible with the principle of subsidiarity, which purports that decision-making should be delegated to the lowest appropriate level of government. However, Gupta (2009, p. 46) noted that while this is seen as an essential component of good governance and increases the legitimacy of decision-making, it “may also lead to non-harmonious policy ... [may] reflect local power politics ... [and it may] not be conducive to equity issues.”

The literature identified many obstacles to effective water governance. Of note, the OECD's 2010 Water Governance Survey examined multi-level water governance arrangements in 17

member countries and highlighted seven key gaps in the design and implementation of their respective water policies (OECD, 2011, pp. 31-35; OECD 2012b, pp. 100-104). These frequently occurring barriers to effective water governance included the following: mismatches between administrative and hydrological boundaries, asymmetric information capacities between stakeholders, fragmented sectoral policy responsibilities, divergent stakeholder objectives, lack of accountability in decision-making practices, and insufficient institutional capacity coupled with inadequate or unstable funding sources (OECD, 2011, p. 32). Gupta et al., (2013, pp. 38-40) explored the OECD’s multi-level governance challenges and offered additional insights into opportunities for addressing the identified deficiencies. Further, Havekes, Hofstra, van der Kerk and Teeuwen (2013, pp. 15-17) suggested a framework that highlighted the inter-relatedness of these coordination challenges and sorted the OECD’s multi-level water governance gap analysis into a three-layer model consisting of content, institutional and relational categories. These frameworks and opportunities are summarized in Table 3.

Table 3 Multi-Level Water Governance Implementation Gaps and Opportunities

Three-Layer Model	OECD Multi-Level Water Governance Gap Analysis		Opportunities
Content Layer	Policy	<ul style="list-style-type: none"> • Sectoral fragmentation of water-related tasks across ministries and agencies. 	<ul style="list-style-type: none"> • Create multidimensional/systemic approaches. • Exercise political leadership and commitment.
	Capacity	<ul style="list-style-type: none"> • Insufficient scientific, technical, or infrastructural capacity. 	<ul style="list-style-type: none"> • Develop local capacity.
	Information	<ul style="list-style-type: none"> • Asymmetries of information (i.e. quantity, quality, and type) between stakeholders. 	<ul style="list-style-type: none"> • Develop instruments for sharing information.
Institutional Layer	Administrative	<ul style="list-style-type: none"> • Mismatch between hydrological and administrative boundaries. 	<ul style="list-style-type: none"> • Match size and appropriate scale.
	Funding	<ul style="list-style-type: none"> • Unstable or insufficient revenues. 	<ul style="list-style-type: none"> • Develop shared financing mechanisms.
Relational Layer	Accountability	<ul style="list-style-type: none"> • Lack of decision-making transparencies across constituencies. 	<ul style="list-style-type: none"> • Develop evaluation instruments. • Strengthen integrity framework at the local level. • Enhance citizen participation.
	Objective	<ul style="list-style-type: none"> • Divergent rationalities are creating obstacles for adopting convergent targets. 	<ul style="list-style-type: none"> • Develop instruments for aligning objectives.

Source: Adapted from Gupta et al., 2013, pp. 38-40; Havekes et al., 2013, pp. 15-17; OECD, 2011, pp. 31-35; OECD, 2012b, pp. 101-104.

Since 2010, the OECD has continued its research into multi-level water governance gaps and has suggested improvements to policy design and implementation responses. There is increased understanding that there is no ‘one-size-fits-all’ approach to water governance challenges, and solutions must be tailored to fit contextual specificities (OECD, 2015, p. 5). Accordingly, the

OECD has published a comprehensive inventory of tools and best practice guidelines on a range of water governance subjects including basin governance, performance indicators, stakeholder engagement, and integrity in water-sector decision-making (2014a).

In 2015, the OECD issued its ‘Principles on Water Governance’ document. Relevant to all levels of government, the twelve principles are based on three central dimensions: *effectiveness*, which relates to having “clear sustainable water policy goals”; *efficiency*, which seeks to “maximise the benefits of sustainable water management and welfare at the least cost”; and, *trust and engagement*, which promotes “building public confidence and ensuring inclusiveness of stakeholders” (2015, p. 3). More specifically, effectiveness includes the encouragement of policy coherence through the clear allocation of roles at the appropriate spatial scale, as well as giving due regard to the institutional capacities of the responsible authorities (2015, pp. 9-10). Efficiency encompasses the development of innovative water governance practices; the promotion of transparent regulatory enforcement frameworks; the timely production and sharing of relevant water data; and, the mobilization of sufficient financial resources at all levels of government through the implementation of user pays and polluter pays mechanisms (2015, pp. 10-11). Finally, trust and engagement incorporate the promotion of integrity and transparency practices (i.e. the eradication of corruption in public procurement processes); the promotion of stakeholder engagement including dialogues that address trade-offs between user groups and generations; and, the development of reliable monitoring and evaluation instruments (2015, pp. 11-12). These principles are depicted in Figure 1 and are described more fully in Appendix E.

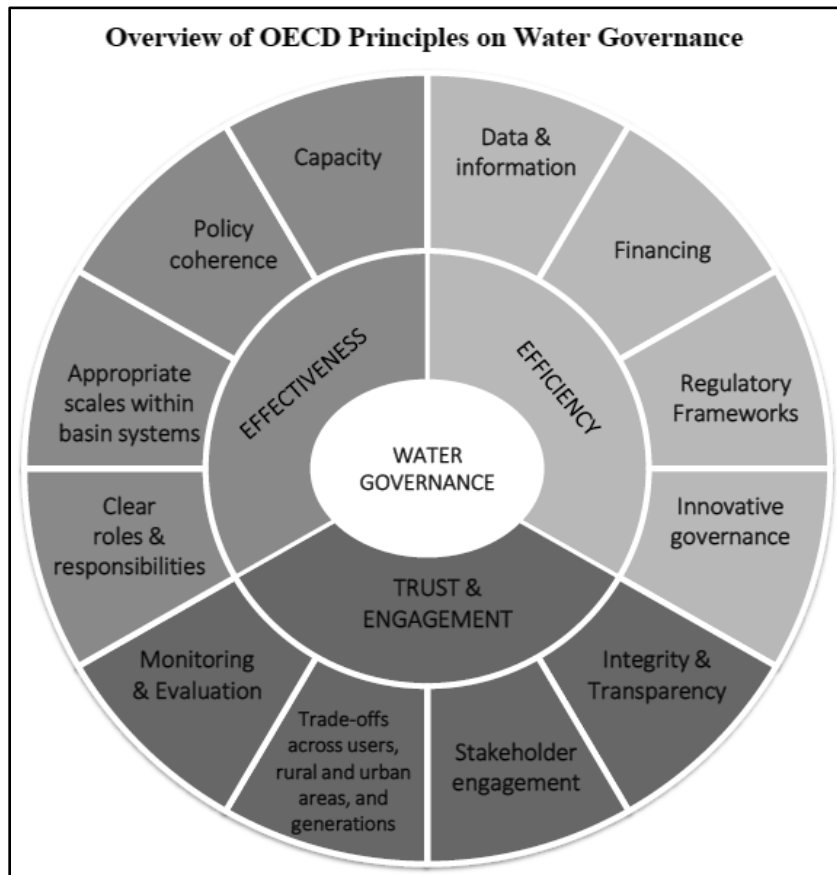


Figure 1 Overview of OECD Principles on Water Governance
Source: OECD, 2015, p. 4.

3.3 FINANCING WATERSHED GOVERNANCE

Effective watershed governance is complex and costly (OECD, 2012a, p. 17). A well-established principle is that it requires sustainable financing for the range of governance, resource stewardship, infrastructure, and administrative activities of the watershed governance organizations (GWP & INBO, 2009, p. 47; Havekes et al, 2013, p. 80; Imperial, 2005, p. 297; Kenney, 2000, p. 4; Leach & Pelkey, 2001, p. 378; Morris & Brandes, 2013, p. 28; Nowlan & Bakker, 2007, p. 37; Nowlan & Bakker, 2010, p. 34; OECD, 2012a, p. 43; OECD, 2012b, p. 75; OECD 2015, p.10). The spectrum of watershed governance functions may include the following: community education, conflict resolution, consultation, coordination across jurisdictional boundaries, data collection, ecosystem protection or restoration, flood protection, hydroelectric generation, infrastructure construction and maintenance, mapping, monitoring, storm water drainage, wastewater collection, and water delivery (Brandes, et al., 2014, p. 32; GWP & INBO, 2009, pp. 47-49; Morris & Brandes, 2013, pp. 17-18; Rees et al., 2008, pp. 13-14). The consequence of insecure or insufficient revenue streams, particularly for core functions, manifests as “ad hoc initiatives chasing project-specific funds ... [or] ... failed forums of inaction” (Brandes et al., 2014, p. 32); and, ultimately results in ineffective watershed governance (Gupta et al., 2013, p. 5).

Sustainable financing of watershed governance is informed by several concepts including water as an economic good, the principles of financing water policy, and the identification of potential revenue sources along with suggested selection criteria. These topics are addressed in the subsections below.

3.3.1 WATER AS AN ECONOMIC GOOD

The Dublin Principles articulated that water is an economic good and should be priced to promote efficient and equitable use (UN, 1992, Section 2, para 4). Yet, water has multiple economic properties in that it resembles “sometimes a public good, sometimes a private good and often lies somewhere in-between” (Rogers & Hall, 2003, p. 24). Whether water-related goods, services or resources are public or private goods depends on their degree of rivalry and excludability (OECD, 2009, p. 25; Parkin & Bade, 2013, p. 392). As exhibited in Table 4, private goods, such as access to a drinking water supply, are considered to be rival (i.e. where consumption by an individual reduces the amount available for others) and excludable (i.e. where an individual exercises their property rights and prevents others from enjoying its use). Public goods, such as access to the broader societal benefits provided by flood control or ecosystem restoration, are considered to be non-rival (i.e. where consumption by an individual does not decrease the amount available to others) and non-excludable (i.e. where it is either very costly or impossible to prevent access to its use). A feature of public goods is that they often experience free-rider-problems where individuals enjoy the benefits of their use but do not fully pay for them (Parkin & Bade, 2013, p. 393). Natural monopoly goods or club goods, such as access to private waterfront recreation areas are considered to be both non-rival and excludable in that access can be restricted to members-only, and each member’s use does not diminish the ability of others to enjoy the same resource. Finally, the use of common-pool resources, such as the unmonitored pumping of a groundwater aquifer, can be considered rival and non-excludable; and, circumstances in which there are no incentives to curb over-consumption or reward sustainable use of the resource can create ‘tragedy of the commons’ situations (Parkin & Bade, 2013, p. 398).

Table 4 Economic Characteristics of Water

Access Consumption	Excludable	Non-Excludable
Rival	Private goods, services, or resources: <ul style="list-style-type: none"> • Drinking water supply. 	Common-pool goods, services, or resources: <ul style="list-style-type: none"> • Groundwater aquifer when exclusive pumping is not monitored.
Non-Rival	Natural monopoly or club goods, services, or resources: <ul style="list-style-type: none"> • Recreational use of a water body when monitoring access is feasible. 	Public goods, services, or resources: <ul style="list-style-type: none"> • Ecosystem protection and restoration, flood control, and stormwater collection.

Source: Adapted from OECD, 2009, p. 25; Parkin & Bade, 2013, p. 392.

These economic characteristics become important factors when examining the range of financing options that can be utilized for funding water-sector functions. It is generally accepted that non-rival and non-excludable goods (i.e. public goods) that benefit whole communities should be provided by public finances (i.e. taxation), and that excludable goods such as private or club goods should be paid for by beneficiaries through tariffs or user fees (Havekes et al., 2013, pp. 84-88; OECD, 2012a, p. 38; Rees et al., 2008, pp. 17-18 & 41-42). Promoting the efficient use of common-pool water resources and protecting them from over-consumption can be achieved through the creation of nested institutional ‘property right’ arrangements (Ostrom, 1990, p. 278); and, by inserting private-sector pricing mechanisms to charge users and beneficiaries with the full cost of using the resource (Parkin & Bade, 2013, p. 401). Another consideration is the off-setting of financing areas such that profitable tariff revenue streams imposed by governments (i.e. water licences, rental fees, or utility user fees) are used to counter the costs of public good functions typically supported by taxation, such as ecosystem restoration, flood control, and mapping services (Rees et al., 2008, p. 18). The overarching expectation is that correct pricing of water-related goods, services and resources will encourage people “to waste less, pollute less, invest more in water infrastructure, and value watershed services” (OECD, 2012a, p. 60).

3.3.2 PRINCIPLES OF FINANCING WATER GOVERNANCE

Decision-making for the financing of water governance functions relies on a framework of four fundamental principles (OECD, 2012a, pp. 14-15 & 39-47). First, the *polluter pays principle* (PPP) assigns costs to individuals responsible for polluting or damaging the environment. This principle seeks to influence behaviours by reducing pollution and generates revenues that can be used to address the negative externalities of the activity (OECD, 2012a, pp. 14-15). However, effective implementation of PPP is limited for a variety of reasons, including: (1) the ability to measure the source of the water pollution, at a feasible cost, may be difficult either due to the lack of reliable technology, or to the extent that industries conceal the degree of pollution; (2) inconsistent monitoring or poor enforcement of water pollution regulatory requirements; (3) existing institutional barriers or property rights; and, (4) the ability to attribute or enforce payment for costs of inherited pollution such as ruins of war, non-point-source contamination from agricultural runoff, or pollution introduced by air or rain from other jurisdictions with less-stringent environmental regulations (Havekes et al., 2013, p. 86; OECD, 2012a, p. 40; Parkin & Bade, 2013, p. 376). In addition, the removal of pollution from strategic, scarce, or irreplaceable water sources may not be possible. In such cases, regulations should protect the water source from pollution rather than tax the pollution.

Second, the *user pays principle* (also known as the *cost-recovery principle* [CRP]) indicates that all those who benefit from the provision of the water-related goods or services must assume a share of the financial burden (OECD, 2012a, pp. 15 & 41). This principle encourages efficient water practices and seeks to recover costs associated with infrastructure development, maintenance, and operations. Key challenges in implementing this principle are the inability to accurately identify beneficiaries or to assign costs related to the many indirect benefits of water governance functions (OECD, 2012a, p. 41). Examples of these types of indirect benefits include the following: reduced prices for agricultural, consumer or industrial commodities due to reduced hydroelectricity costs; increased residential property values, recreation opportunities and revenues from recreation-based tourism opportunities due to improvements in aquatic and riparian ecosystems; and, the avoided costs to the health care system due to the reduced incidence of water-borne diseases (OECD, 2012a, p. 43).

Third, the *equity principle* addresses the inherent tension between the polluter pays and user pays principles when these costs exceed the capacity of the user to pay (OECD, 2012a, p. 15). In this manner, the regressive distributional effects of increased charges can be mitigated by creating affordable fee structures that consider basic human needs; and, any concerns about impaired competitiveness in either agriculture or industrial production can be acknowledged and moderated by other forms of public subsidies (OECD, 2012a, p. 46).

Finally, the *policy coherence principle* underscores the importance of harmonized policy initiatives that addresses all water-resource user groups (i.e. agriculture, energy, forestry, industry, recreation, and tourism). An example of incoherent policy, which created a perverse incentive was until the mid-2000s, fully 25% of Spanish agricultural subsidies were tied to production levels intended to promote regional workforce stability and competitive agricultural commodity prices but inadvertently promoted inefficient irrigation practices (Aldaya et al., 2010, pp. 55-57; Havekes et al., 2013, p. 87; OECD, 2012a, p. 47).

3.3.3 SUSTAINABLE FINANCING SOURCES AND SELECTION CRITERIA

The evolution of water-sector financing can be traced through two landmark papers published by the World Water Council. The 2003 Camdessus Report focused on the need for doubling the amount of financing available to address deficits in water supply infrastructure (Winpenny, 2003, p. v); and, the 2006 Gurria Report concentrated on demand-side water management functions and the inability of local governments to access financing for existing water services (Van Hofwegen, 2006, p. 2). In addition, Rees et al. (2008) indicated that while much has been written in recent decades about improving financing for the delivery of water and wastewater services including their related infrastructure development and maintenance, “there is very little that covers the issues of financing for the overarching water resource management and governance systems that are critical for all users and for environmental protection” (p. 4).

The literature identifies three ultimate revenue sources for financing water-sector functions: taxes, tariffs, and transfers (GWP & INBO, 2009, p. 47; OECD, 2009, pp. 15 & 29-30; Rees et al., 2008, p. 12; Stanton, Flores & Batker, 2014, pp. 22-32). Also known as the 3Ts, these sources identify who will pay the costs of the water function, and links the payers with the mechanism or financial instrument (United States Environmental Protection Agency [USEPA], 2007, p. 9). Table 5 lists potential financing mechanisms associated with these three sources.

Taxes are collected at all levels of government and may be redirected towards water-sector activities (GWP & INBO, 2009, p. 50; OECD, 2009, p. 29). Senior governments have the ability

to collect general taxes through income or sales taxes, consumptive taxes on alcohol, cigarettes or fuel, and green or environmental taxes; whereas, regional or local governments are typically constrained to levying property or parcel taxes (Fraser Basin Council [FBC], 2015, pp. 13 & 16).⁷

Table 5 Potential Financing Mechanisms by Source

Mechanisms by Payer Sources	Senior Governments	Regional and Local Governments	Non-Government Organizations or Individuals
Taxes	<ul style="list-style-type: none"> • General taxes (i.e. income or sales) • Consumptive taxes (i.e. alcohol, cigarettes, and fuel) • Green taxes • Environmental service taxes/ fees 	<ul style="list-style-type: none"> • Property /parcel taxes 	
Tariffs	<ul style="list-style-type: none"> • Water licence fees and rentals • Conservation surcharges 	<ul style="list-style-type: none"> • Water pricing fees • Permit fees • Development cost charges • Environmental impact fees • Utility user fees • Resource recovery fees • Watershed protection fees • Recreational user fees 	
Transfers	<ul style="list-style-type: none"> • Grants • Endowment funds 	<ul style="list-style-type: none"> • Grants 	<ul style="list-style-type: none"> • Grants • Cash and in-kind contributions • Conservation Trust Funds • Payments for environmental services (PES)

Source: Adapted from FBC, 2015, pp. 11-29; GWP & INBO, 2009, pp. 49-55; Hurd, 2009, pp. 5-8; Rees et al., 2008, p. 12; Stanton et al., 2014, pp. 22-27.

Tariffs can be imposed by all levels of government. They are increasingly used to promote water conservation and to capture the full cost-recovery for infrastructure development, maintenance, and operations (Brandes, Renzetti & Stinchcombe, 2010, pp. 2-3; OECD, 2009, p. 79). Tariffs are considered the “price that users pay” for the use of water or wastewater-related services; and similarly, “charges” refer to the “price paid for abstraction or pollution of water” (OECD, 2009, p. 94). They may include combinations of non-volumetric and volumetric rate formats. Non-volumetric fees include one-time service connection charges and flat-rate fees which are charged regardless of the volume consumed (OECD, 2009, p. 78). Volumetric-based fees include

⁷ The Gas Tax Fund (GTF) is an example of federal gas taxes that are redistributed to Canadian municipalities for infrastructure projects, which may include transportation, solid waste management, sports facilities, as well as drinking water, wastewater, and storm water systems (UBCM, 2014, pp. 6-7).

increasing block tariffs (IBTs) where rates are stepped upwards to match consumption (i.e. including seasonal), or adjusted increasing block tariffs, which are modified to address social concerns (i.e. low-income families) (p. 78). Examples of tariffs include the following: water licence fees, annual water rentals charges, conservation surcharges funded through fishing or hunting licence fees, water or wastewater utility user fees, resort or recreational user fees, permit fees, development cost charges, watershed protection fees, or environmental impact fees based on impervious surface areas that discharge untreated stormwater into municipal sewer systems (FBC, 2015, p. 14; Hurd, 2009, pp. 5-8; Stanton et al., 2014, pp. 28-31).⁸

Transfers include all forms of grants and philanthropic donations (OECD, 2009, p. 29). They may be received as earmarked or non-earmarked financial transfers between levels of government (OECD, 2011, p. 104), or as ‘social financing’ transfers from private-sector corporate social responsibility (CSR) programs⁹, non-governmental organizations (NGOs), or private individuals. Transfers may include cash or in-kind donations such as materials, equipment, or technical expertise (Rees et al., 2008, p. 45); and, they are typically used for designated programs, projects or planning (Morris, 2014, p. 13; OECD, 2009, p. 29). Another form of transfers include payment for environmental services (PES) schemes where downstream water users voluntarily pay the costs for upstream property owners to modify their agricultural or forestry land-use practices in order to conserve riparian ecosystems (FBC, 2015, p. 28; GWP & INBO, 2009, p. 54; USEPA, 2007, pp. 10-11).

A subset of the literature addresses the ability of water governance organizations to access repayable sources of finance to fund long-term costs of water and wastewater infrastructure projects. Access to market-based investment financing can occur through commercial loans, bonds, or equity funds (OECD, 2012b, p. 68). Other examples include the creation of water-sector-specific financial institutions such as the Nederlandse Waterschapsbank (i.e. Dutch Water Bank) or revolving loan funds (RLF) which provide low-cost financing; or alternatively, the establishment of public-private partnerships to finance, build, and operate infrastructure projects (FBC, 2015, p. 27; GWP-INBO, 2009, p. 55; Havekes et al., 2015, p. 52; OECD, 2012b, p. 67). A caveat with the creation of these forms of liabilities is that repayment must ultimately be accomplished through the collection of taxes and tariffs by local, regional or senior governments (OECD, 2012a, p. 76; Rees et al., 2008, p. 12).

Achieving financial sustainability for watershed governance activities requires a coherent financing strategy that addresses all costs (i.e. financial, economic, and environmental) and incorporates a diversified mix of financing mechanisms from all 3T revenue streams (OECD, 2009, pp. 26-29). When creating the watershed financing strategy, a variety of objectives needs to be considered. Foremost, the funds need to be adequate, sustainable, and reliable over the long-term to achieve the intended program outcomes (OECD, 2009, p. 81). The funding source needs to be perceived as being fair, equitable, and politically acceptable to most of the affected

⁸ Examples of conservation surcharges include the Habitat Conservation Trust Fund (HCTF), which uses surcharges from provincial hunting and freshwater fishing licences towards grants for habitat restoration projects; and, the Pacific Salmon Foundation (PSF), which uses surcharges from federal saltwater fishing licences to fund salmonid protection and enhancement projects (FBC, 2015, p. 16).

⁹ Examples of CSR programs that provide project-specific grants include Royal Bank of Canada’s Blue Water Project, Real Estate Foundation of British Columbia (REFBC), and VanCity Community Foundation (FBC, 2015, pp. 22 & 50).

persons; and similarly, the application of the funds must encourage economic efficiencies and discourage perverse incentives or free riders (USEPA, 2007, pp. 9-10). From the perspective of the watershed governance organization, the funds must be accessible (i.e. either by themselves or through a partner agency), appropriate to the task at hand, and allow for autonomy and timeline flexibility in their utilization (FBC, 2015, p. 12). Watershed governance financing objectives can be matched to the 3T sources in the following manner. Taxes are considered to be the most appropriate source of funds that are adequate, sustainable, and avoids free riders; whereas, tariffs, user fees, and transfers of cash or in-kind donations are more directly associated with the good or services received and are therefore perceived to be fair, equitable, accessible, politically feasible, and promote economic efficiencies (USEPA, 2007, pp. 9-10). While no one financing mechanism will meet all of the listed objectives, a combination of several financing mechanisms can be structured to address most of them (FBC, 2015, p. 12). Table 6 displays watershed financing objectives with suggested revenue sources.

Table 6 Watershed Financing Objectives by Suggested Revenue Source

Watershed Financing Objective	Description	Suggested Revenue Sources		
		Taxes	Tariffs	Transfers
Accessible	Funding is accessible to the watershed organization or partner agencies.	✓	✓	✓
Adequate	Creates sufficient funds to accomplish intended programs.	✓		
Appropriate	Clear rationale between the origin of funding and its application.	✓	✓	
Autonomy	Able to allocate funds to priority projects.	✓	✓	✓
Efficient	Promotes economic efficiencies – is not regressive. Funds can be administered in an effective manner.		✓	✓
Equitable	Perceived by most persons to be equitable.		✓	✓
Fair	Perceived by most persons to be fair.		✓	✓
Flexible	Able to allocate funds within own timelines.	✓	✓	✓
No perverse incentives	Avoids free riders.	✓	✓	
Politically feasible	Achieves sufficient political acceptance at all levels.		✓	✓
Sustainable	Creates funds that are reasonably reliable and predictable.	✓	✓	

Source: Adapted from FBC, 2015, p. 12; OECD, 2009, p. 81; USEPA, 2007, pp. 9-10.

3.4 WATERSHED GOVERNANCE IN BRITISH COLUMBIA

Water governance in British Columbia is shaped by a framework of federal, provincial and local government statutes. Over the past two decades, there has been increased pressure to address the province's growing freshwater crisis through an examination of its water management policies and legislation (BCMOE, 2010, p. 4). Since the introduction of the Living Water Smart (LWS) program in 2008, the Province has engaged in a series of consultation processes that culminated

in the repeal of the historic *Water Act* (1909) and recent replacement with the *Water Sustainability Act* (WSA). An outline of British Columbia’s legislative framework, including an overview of the current state of watershed governance organizations within the province is discussed below.

3.4.1 LEGISLATIVE FRAMEWORK

Canada’s water policy framework reflects an array of jurisdictions, programs, and stakeholders. Sections 91 and 92 of the *Constitution Act* (1982) distribute legislative powers between the federal and provincial governments. The federal government is assigned responsibility for water on federal lands, navigable waterways, international transboundary waters, and fisheries; whereas, the management of water on provincial Crown Lands, non-renewable resources, and generation of electrical energy is allocated to the provinces (Ayoo & Horbulyk, 2008, p. 100; Bakker & Cook, 2011, p. 277; Brandes & Curran, 2009, p. 1; Robins, 2007, pp. 3-4). In turn, water distribution to citizens is typically managed by regional, local or First Nations governments. Further, many watersheds are located on Crown Lands and may be involved in First Nations land claim processes (Brandes et al., 2014, p. 7). Consequently, water governance in Canada is characterized as having mismatches between its hydrological and administrative boundaries, overlapping or unclear jurisdictional boundaries, as well as poor vertical and horizontal coordination between and within levels of governments (Brandes et al., 2005, p. ii; Brandes & Curran, 2009, pp. 1-2; de Loë & Murray, 2012, pp. 5-6; Hill, Furlong, Bakker, & Cohen, 2008, p. 316; Nowlan & Bakker, 2007, pp. 25-26; OECD, 2011, pp. 138-142).

British Columbia is described as a “geographically, hydrologically and culturally diverse province” (Brandes et al., 2005, p. 28). Its water governance framework is also noted for its complexity. In total, there are 22 federal, provincial, and local government statutes that regulate the allocation, pricing, public safety, or public health aspects of water on Crown or private land; and, there are 189 regional and local governments as well as 198 First Nations that directly or indirectly influence water governance in the province’s 246 major watershed groupings (BCCSCD, n.d.b.; BCMOE, n.d.c., para 3; BCMOE, 2013, p. 2; Government of Canada, 2010, para 1).¹⁰ Figure 2 illustrates the scope and complexity of watershed governance in British Columbia, and Appendix F provides an overview of the relevant statutes.

¹⁰ While British Columbia has 291, 000 hydrologically unique watersheds (BCMOE, 2008, p. 8), for management purposes they are clustered into 246 major watershed groupings (BCMOE, n.d.c., para 3; BCMOE, n.d.d, map). Of these groupings, most are located in remote, relatively uninhabited regions of the province. The focus, from a governance perspective, is on the several dozen socio-ecological watershed systems of varying scales that have evolved where there is a “sophisticated interplay between the social, ecological, and hydrological systems” (Brandes et al., 2014, p. 1).

Federal Government	•7 Statutes
Provincial Government	•13 Statutes
27 Regional Districts 162 Municipalities	•2 Statutes
198 First Nations	
246 major watershed groupings	

Figure 2 Scope of Watershed Governance in British Columbia

Sources: BCCSCD, n.d.b.; BCMOE, n.d.c., para 3; BCMOE, n.d.d., map; BCMOE, 2013, p. 2; Canada, 2010, para 1.

Until February 2016, the *Water Act* (1909) was the central feature of British Columbia’s water law framework. The Act was drafted over a century ago during an era when water was considered to be abundant, and the policy objective was to “encourage settlement and provide certainty for economic uses of water such as irrigation and mining” (Nowlan & Bakker, 2007, p. 42). The Act stipulated that the Province owned all ground and surface water rights, and it established the terms and conditions by which surface water licences could be granted. It also embedded the “First in Time, First in Right” (FITFIR) priority system for allocating water during times of shortage based on licence seniority (i.e. senior water licences are permitted to draw their full water allocation before junior licences, regardless of the purpose) (BCMOE, 2010, pp. 40 & 83; BCMOE, 2013, p. 17).

Over time, the *Water Act* (1909) became characterized as outdated in that it perpetuated a ‘myth of abundance’, it contributed to fragmented and incoherent decision-making, and it was deemed not adequate to address the complexities of British Columbia’s water policy needs in the 21st century (BCMOE, 2010, p. 25; BCMOE, 2013, p. i; Brandes & Curran, 2009, p. 2; Brandes & Morris, 2016, p. 13). Specific criticisms of the Act included the following: it failed to regulate or monitor groundwater use; the surface water licensing decisions lacked understanding of the interconnectedness of ground and surface water hydrology; the surface water licences lacked expiry dates and were granted in perpetuity; and, the FITFIR allocation system failed to account for instream flow needs to preserve aquatic ecosystems during seasonal variations or droughts (BCMOE, 2013, p. 9; Brandes & Curran, 2009, p. 15; Nowlan & Bakker, 2007, pp. 42-44).

In 2008, the Province released the *Living Water Smart: British Columbia’s Water Plan* (LWS) program (BCMOE, 2008). This multi-faceted strategy included the following components. It proposed updates to water legislation, including the historic *Water Act*, in order to address groundwater regulation, minimum flow requirements for ecosystem preservation during periods of water scarcity, and commitments to providing safe drinking water in First Nations communities (pp. 45-49 & 71). In preparation for the effects of climate change, it promoted various watershed management planning, conservation and restoration projects (pp. 51, 57 & 61). It addressed the ongoing need for water-related infrastructure funding including structural

floodplain protection (pp. 63-65).¹¹ And, it proposed amendments to the BC Building Code to require conservation plumbing measures (p. 77). In 2010, the Province embarked on the Water Act Modernization (WAM) process; and in 2013, after an extensive series of public consultations released the proposal for the new legislation (BCMOE, 2013, pp. iii – v).

On February 29, 2016, the *Water Act* (1909) was repealed and the *Water Sustainability Act* (WSA) was brought into force. The new Act includes provisions for the regulation of groundwater use, establishes environmental flow needs for protecting stream health and aquatic environments, controls water during periods of scarcity by retaining the precedence of rights established under the historic FITFIR allocation system; improves water security, efficiency and conservation by limiting water licences to 30 years; and, it allows for a range of water governance approaches (BCMOE, n.d.a., paras 1-7). Coincidental with the WSA, a series of initial regulations were also brought into force. These regulations include provisions for the allocation of groundwater and surface water; establishes a water pricing schedule for fees, rentals and tariffs; protects groundwater; identifies dam safety requirements; creates Water Districts; and, specifies administrative fines for violating provisions of the Act (BCMOE, n.d.b., paras 4-9). In late-2016, the Province will initiate a new round of stakeholder engagement opportunities. It intends to introduce further regulations for creating Water Sustainability Plans, improving measurement and reporting of water usage, and enabling the creation of alternative governance approaches (BCMOE, n.d.b., paras 12-13).

The WSA is perceived as “an unprecedented opportunity to fully modernize British Columbia’s water laws” (Brandes, Carr-Wilson, Curran, & Simms, 2015, p. 1). It implemented groundwater licensing, addressed minimum environmental flow requirements in sensitive streams to better protect fish stocks during periods of scarcity, and, provided for the future creation of regional water management plans and the delegation of decision-making authority to non-government watershed organizations (Gage, 2014, paras 5-7). While the introduction of the new water pricing regime represents a doubling over the previous fee structures, British Columbia’s current water rate structure remains among the lowest in Canada; and, the concern is that without regular pricing reviews these rates may be insufficient to support the full costs of implementing the new legislation (Brandes et al., 2015, p. viii; Carr-Wilson, Brandes & Dobell, 2015, pp. 2-3).

3.4.2 WATERSHED GOVERNANCE ORGANIZATIONS IN BRITISH COLUMBIA

Unlike other Canadian provinces (i.e. Alberta and Ontario), British Columbia does not have an integrated approach to creating or managing water governance organizations (NRTEE, 2011, p. 119). There are only two examples where British Columbia has specifically enacted legislation to create formal watershed governance organizations with delegated decision-making powers (Nowlan & Bakker, 2007, p. 40). First, the *Municipalities Enabling and Validating Act* (MEVA) created the Okanagan Basin Water Board (OBWB) in 1970 and permitted three Regional Districts (i.e. North Okanagan, Central Okanagan, and Okanagan–Similkameen) to engage in direct property taxation in order to fund infrastructure projects, milfoil treatment processes, and

¹¹ The replacement of aging water infrastructure has become a critical issue in Canada. Since 2009, British Columbia’s municipalities have been required to comply with Public Sector Accounting Board Directive PSAB-3150. They must create inventories, calculate accumulated depreciation on all engineered municipal infrastructure, and develop asset management strategies to ensure that roadways, water distribution, wastewater treatment, as well as storm water and flood protection systems are appropriately maintained and then replaced at the end of their capital life cycles (BCCSCD, 2013, p. 8).

basin-wide initiatives (Brandes et al., 2014, p. 12; FBC, 2015, p. 31; Nowlan & Bakker, 2007, p. 50). Second, the Columbia Basin Trust was formed in 1995 to manage investment income from the \$321 million endowment fund received from the provincial government, and to provide programs within the basin to address economic, environmental and social issues arising from the 1964 *Columbia River Treaty* flooding (Brandes et al., 2014, p. 12; FBC, 2015, p. 28).

In the absence of a coordinated provincial framework, many communities and grass-roots watershed groups are attempting to resolve local issues through a bottom-up approach to collaborative watershed governance (Brandes et al., 2014, p. viii). The resulting semi-formal and informal governance organizations are described as ad hoc, fragmented, and patchwork-like (BCMOE, 2010, p. 25; Nolan & Bakker, 2007, p. 10). They are further characterized by their diversity in hydrological settings, mandates, institutional capacities, funding, and decision-making processes particularly with respect to inconsistent inclusion of local First Nation communities (Nowlan & Bakker, 2007, pp. 40-41; Brandes et al., 2016, pp. 12-14).

Based on a scan of 230 non-government watershed groups and 11 key informant interviews, Morris & Brandes (2013) described the state of water governance in British Columbia as a “dynamic ecosystem of organizations working at different scales with diverse approaches and objectives” (p. 13). They identified four strata of watershed organizations and described them as follows. Engaged at the community level, ‘Watershed Groups’ are involved in restoration, education, and advocacy activities, and are placed along the decision-making continuum of seeking to influence local decisions towards having a formal decision-making role (p. 13). Second, ‘Water Leaders’ seek to influence decision-making and may include both individuals or groups with technical expertise, long-term presence and either a “core mandate related to freshwater protection” or “ongoing programmatic interests in freshwater” (p. 14). Third, ‘First Nations Groups / Associations’ have a high interest in freshwater protection and work towards acknowledgement of water rights for indigenous peoples (p. 14). Finally, ‘Other Groups’ are characterized as having or have had “a strategic interest in water” (p. 14) and are working towards influencing water policy or local decision-making. They observed that freshwater protection in British Columbia has suffered in recent decades due to declining capacity at the federal and provincial government levels (p. 27). They noted evidence of jurisdictional fragmentation caused by different levels of governments making land-use or resource extraction decisions without an integrated framework; and, institutional fragmentation caused by variations in capacity as some communities are more advanced in watershed governance than others (p. 28). They concluded that there is a critical need to determine sustainable financing models for watershed governance in the province (p. 28).

3.5 SUMMARY

The literature review examined numerous themes related to the sustainable financing of watershed governance in British Columbia. The first section discussed watershed governance. It defined watersheds, established that they are the preferred spatial scale for water management and governance functions, and highlighted the paradigm shift from hydraulic mission to Integrated Water Resource Management (IWRM). It defined watershed governance as the combination of institutional systems and decision-making processes through which all aspects of water are delivered, protected, and conserved. It described watershed governance organizations as the products of their exogenous and endogenous circumstances, and it examined several typologies of watershed governance organizations. It outlined the dominant discourses in water

governance in recent decades that included the shift in emphasis from government to governance, the importance of good governance, as well as the distinctions between water management and water governance. Finally, it underscored the barriers to effective water governance and introduced the OECD's (2015) Principles on Water Governance.

The second section discussed the financing of watershed governance. Anchored in the Dublin Principles' articulation that water is an economic good and should be priced to promote efficient and equitable use, the different economic properties of water were examined. It outlined the four fundamental principles of financing water governance (i.e. polluter pays, user pays, equity principle, and policy coherence). It identified taxes, tariffs, and transfers (i.e. 3Ts) as the three ultimate revenue sources for financing water-sector functions, and it listed potential financing mechanisms for each source. It discussed having a coherent financing strategy that incorporates a diversified mix of mechanisms from each of the 3T revenue streams to address all costs of watershed governance, and it suggested selection criteria for this purpose. This section also highlighted a gap in the literature, in that much has been written on financing water delivery and wastewater infrastructure, but little has been written on financing IWRM or watershed governance functions (Rees et al., 2008, p. 4).

The third section provided an overview of the scope and complexity of British Columbia's water governance framework. Beginning with the *Constitution Act* (1982), it described the distribution of legislative responsibilities for water between the federal and provincial governments, as well as the relevant federal, provincial, and local government statutes. It characterized the legislative framework as outdated and entering a period of transition with the recent enactment of the *Water Sustainability Act* on February 29, 2016. It discussed the two examples of formal, legislated water governance organizations in the province (i.e. the Okanagan Basin Water Board and the Columbia Basin Trust). It highlighted that, in the absence of a coordinating water governance framework, the semi-formal and informal watershed governance organizations exist as an ad hoc, fragmented, patchwork-like array of institutions that are typified by their variations in hydrological settings, mandates, range of activities, institutional capacities, decision-making processes, and funding sources.

The literature review was used to inform the conceptual framework, the jurisdictional scan, and the development of questions for the key informant interview process.

4.0 CONCEPTUAL FRAMEWORK

This section describes the conceptual framework used to approach the research objective. British Columbia is on the threshold of a freshwater crisis. Ecosystem health, water quantity, and water quality are threatened by the effects of pollution, unsustainable consumption, and exacerbated by climate change (BCMOE, 2008, p. 41; Brandes & Curran, 2009, p. 1; Brandes & Morris, 2016, p. 1). The Province’s legislative framework for water governance is described as being outdated and consisting of an uneven “patchwork of jurisdictions, legal authority, differing governance models, and mandates” (Nowlan & Bakker, 2007, p. 10). The resulting jurisdictional fragmentation and competing stakeholder mandates makes it challenging to secure sustainable funding to fulfill core functions of water governance organizations (Bakker & Cook, 2011, p. 277). Further, in the current era of retreating government and public sector fiscal restraints, senior governments are unable to fully fund watershed activities (Archibald, Eastman, Ellis & Nyberg, 2014, p. 8; Bakker & Cook, 2011, p. 285; Brandes & Morris, 2016, p. 14); and, local governments are “squeezed between [the] limitations [of their revenue base] and rising expectations” (Union of BC Municipalities [UBCM], 2013, p. 18).

The literature review established that effective watershed governance is complex and costly; and, that it requires adequate and sustainable financing for the governance, resource stewardship, infrastructure, and administrative activities of the watershed governance organizations (GWP & INBO, 2009, p. 47; Havekes et al, 2013, p. 80; Imperial, 2005, p. 297; Kenney, 2000, p. 4; Leach & Pelkey, 2001, p. 378; Morris & Brandes, 2013, p. 28; Nowlan & Bakker, 2007, p. 37; Nowlan & Bakker, 2010, p. 34; OECD, 2012a, p. 43; OECD, 2012b, p. 75; OECD 2015, p.10). Consequently, there is an urgency to identifying financing solutions that can be tailored to meet the diverse regional requirements and capacities of watershed governance organizations in British Columbia. It is anticipated that the enactment of the *Water Sustainability Act* on February 29, 2016 and the future development of regulations related to alternative water governance approaches will begin to address these issues. Figure 3 depicts the linkages between these concepts as they relate to British Columbia’s current freshwater crisis.

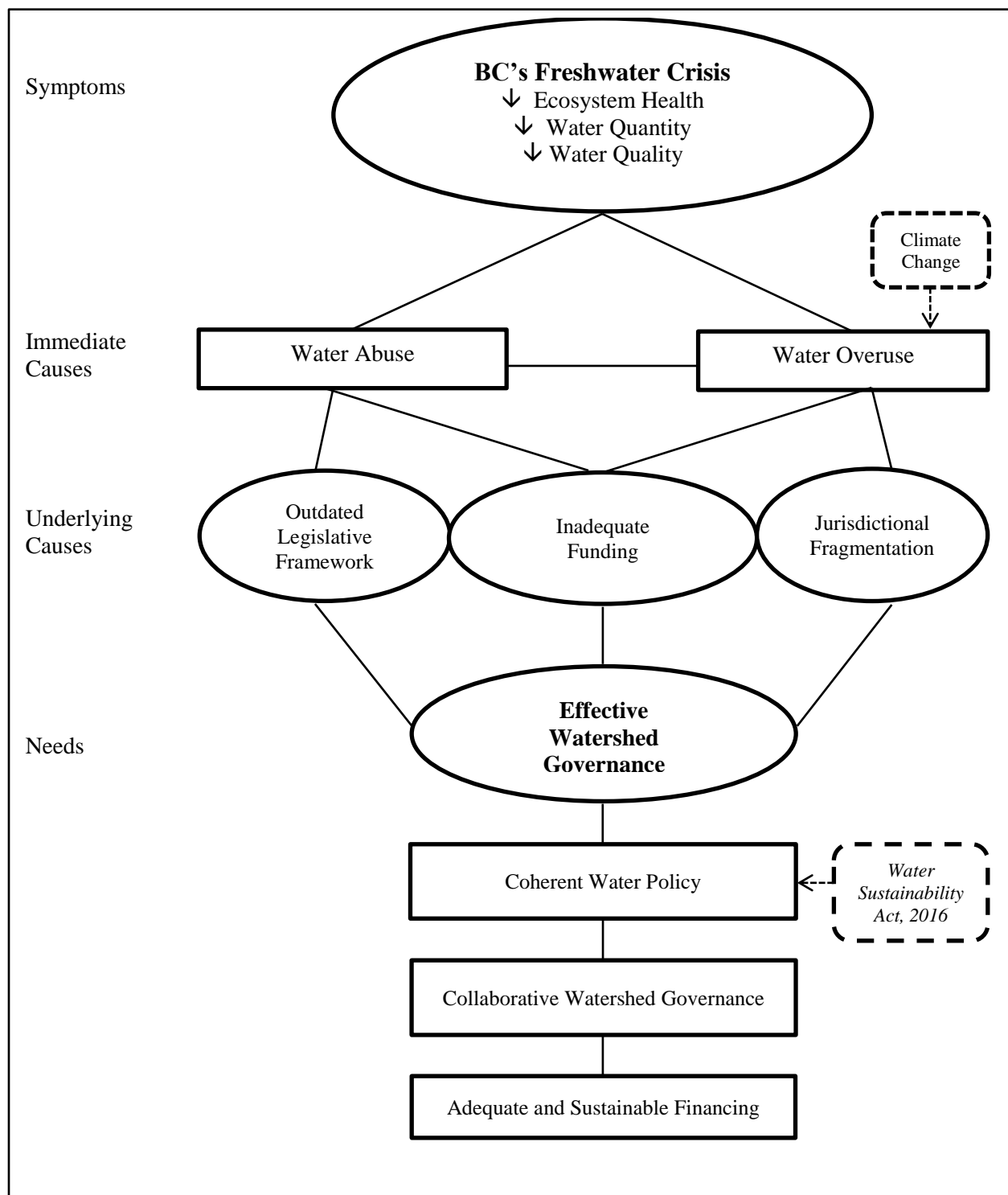


Figure 3 Addressing British Columbia's Freshwater Crisis
 Source: Framework adapted from IFAD/ UNICEF, n.d.

Figure 4 illustrates a logic model relationship whereby watershed governance organizations select from a range of possible financing options to fund their respective activities, which are intended to improve outcomes for ecosystem health, water quality, and water quantity. This conceptual framework informs the data collection and presentation of findings for this report.

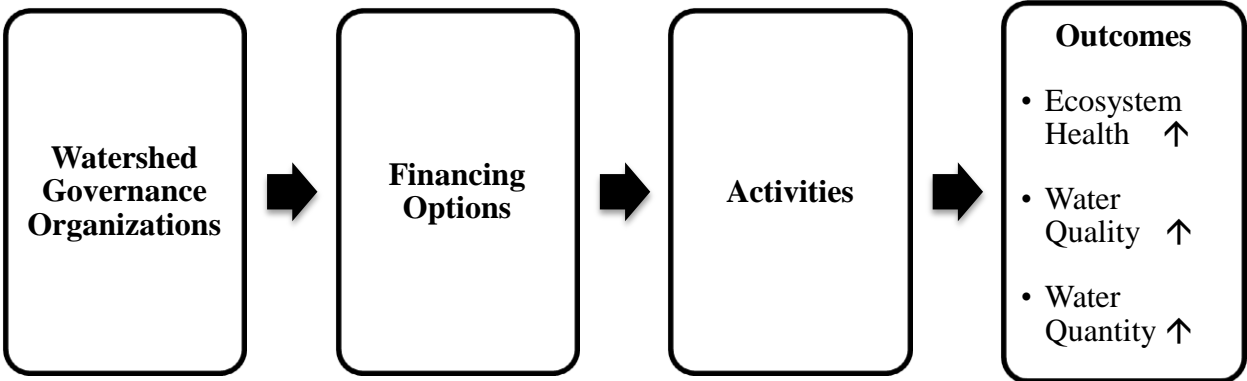


Figure 4 Conceptual Framework - Selection of Financing Options
Source: Adapted from OECD, 2012b, p. 76

5.0 JURISDICTIONAL SCAN

5.1 INTRODUCTION

The jurisdictional scan examines seven watershed governance organizations located in British Columbia, other Canadian provinces, the United States, and Europe. Using the process outlined in Section 2.3, the selection of these organizations was informed by the representativeness of their characteristics and correlation to Hooper’s (2005) typology of river basin organizations. The scan compiled information from research articles, government websites, published reports, and media articles. Also, the organizations’ websites were reviewed for internal publications such as strategic plans, annual performance reports, and news releases. Collectively, these sources provided data on each organization’s hydrological context, governance arrangements, vision and mission statements, programs of activities, and revenue sources.

This section compares each organization’s geographical, jurisdictional, and institutional arrangements; and, it examines the range of financial instruments used to fund their activities. The scan includes two watershed governance organizations from British Columbia, including the Drinking Water and Watershed Protection Program of the Regional District of Nanaimo (RDN) and the Okanagan Basin Water Board (OBWB). The three examples from across Canada consist of Alberta’s Bow River Basin Council (BRBC), Ontario’s Grand River Conservation Authority (GRCA), and Nova Scotia’s Clean Annapolis River Project (CARP). The two international examples include the Nisqually River Council (NRC) in Washington State, and the Hoogheemraadschap van Rijnland (HvR) Regional Water Authority in the Netherlands. Table 7 lists the sequence in which the case study watershed organizations are addressed in this section.

Table 7 List of Case Study Watershed Organizations per Hooper’s Typology

Acronym	Watershed Organization	Year (current / original)	Governance Type per Hooper
CARP	Clean Annapolis River Project, Nova Scotia	1990	Advisory / Association
RDN	Drinking Water and Watershed Protection Program, Regional District of Nanaimo, Nanaimo, British Columbia	2008/ 1967	Advisory / Corporation
OBWB	Okanagan Basin Water Board, Okanagan Valley, British Columbia	1970	Corporation
BRBC	Bow River Basin Council, Alberta	2004/ 1992	Council
NRC	Nisqually River Council, Washington State, USA	1987	Council
GRCA	Grand River Conservation Authority, Ontario	1966/ 1932	Authority
HvR	Hoogheemraadschap van Rijnland, Netherlands	1992/ 1248	Authority

5.2 CLEAN ANNAPOLIS RIVER PROJECT, NOVA SCOTIA

Located on the southern shore of the Bay of Fundy, the Annapolis River basin is ranked as the third largest watershed in Nova Scotia totaling 126 kilometres in length and having a drainage area of 2250 square kilometres (Sutherland, 2003, p. 1). With a population of approximately 124,000 (Statistics Canada, n.d.), the basin includes the communities of Aylesford, Canadian Forces Base Greenwood, Kingston, Middleton, Bridgetown, Annapolis Royal, and Digby (Figure 5). The area is heavily influenced by agriculture, particularly livestock, fruit trees, and berries production (Timmer, de Loë, & Kreutzwiser, 2007, p. 191).

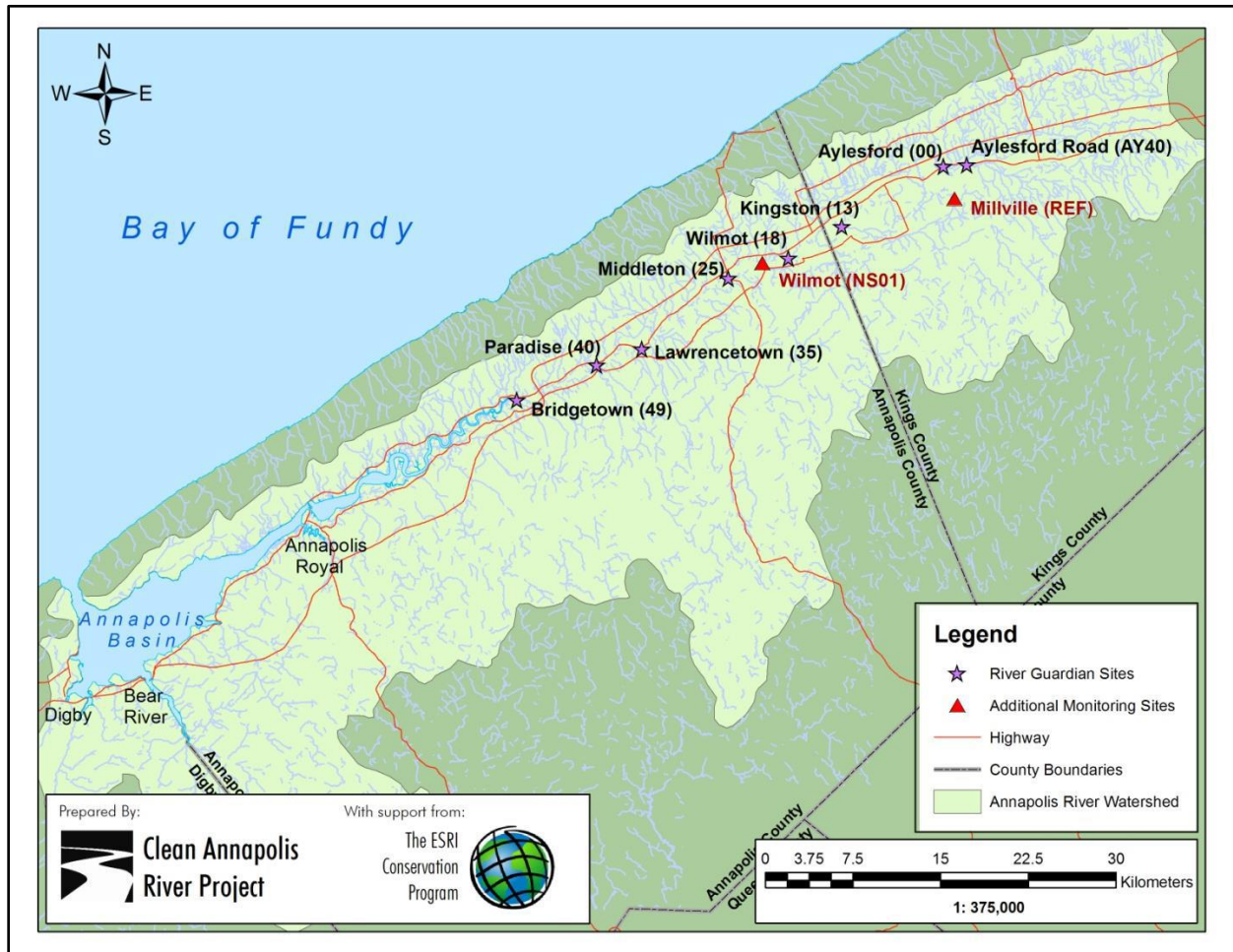


Figure 5 Annapolis River Watershed, Nova Scotia
Source: Clean Annapolis River Project, 2013, p.5.

CARP was formed in 1990 as a non-profit society and brought together stakeholders from across the Annapolis watershed. They were concerned with contaminated drinking water caused by agricultural runoff, sewage leaks from municipal and household septic systems, degraded riparian and aquatic habitats, and the corresponding decline of fish stocks (Sutherland, 2003, p. 1; Timmer et al., 2007, pp. 188 & 191).

The impetus for CARP's formation arose from two coincidental events. First, the Annapolis River was rejected for a Canadian Heritage River designation due to its degraded water quality; and, second, there was an opportunity to participate as a demonstration site for an environmental

initiative through the Atlantic Estuaries Cooperative Venture (Beveridge, 2006, p. 2; CARP, n.d.c.). In 1991, CARP was designated as one of the 14 independent community-based organizations to participate in Environment Canada’s Atlantic Coastal Action Program, which advocated that “communities, when provided with the right tools, could solve their own environmental problems” (Beveridge, 2006, p. 2).

CARP’s activities are focused on the enhancement of the “ecological health of the Annapolis River watershed through science, leadership and community engagement” (CARP, n.d.c.; CARP, 2015, p. 1). These goals are accomplished through a series of programs that include: watershed management planning, community education, water quality monitoring, riparian restoration and conservation, and stewardship projects for research and protection of Atlantic Salmon, Striped Bass, and the endangered Woods Turtle (CARP, 2015, pp. 2–6). Challenges to the successful fulfillment of their mandate are related to their indirect relationship with local governments, coupled with local governments not taking a ‘whole-of-watershed’ perspective, and the ‘problematic’ reliance on external grants (Timmer et al., 2007, p. 196).

As a non-profit society, CARP’s membership is open to individuals or businesses that pay an annual membership fee. The society is governed by a Board of Directors comprised of 15 members: twelve are voting members elected annually by the general membership, and three are non-voting members appointed by Environment Canada, Department of Fisheries and Oceans, and Nova Scotia’s Ministry of Environment respectively (CARP, n.d.b., paras 1-3). The society employs five full-time and twelve part-time employees and has an annual operating budget of approximately \$627,200. Based on the society’s published 2014 Financial Statements (pp. 2-3), its revenues were derived mainly from federal grants (38%), provincial grants (33%), corporate grants, charitable gifts and donations, community fundraising (25%), and memberships (4%); and, its expenditures were classified as wages (47%), operating costs (27%), and projects (26%).

5.3 WATERSHED PROTECTION PROGRAM, REGIONAL DISTRICT OF NANAIMO, BC

Located on the east coast of Vancouver Island, the Regional District of Nanaimo (RDN) has a population of 146,600 and spans an area of 2035 square kilometres (RDN, 2015c; RDN, 2015d). Incorporated as a local government entity in 1967, the RDN’s Board of Directors consists of 17 members – ten of whom are elected officials appointed by the four constituent municipalities (i.e. Nanaimo, Parksville, Qualicum Beach and Lantzville) and a director elected from each of the seven unincorporated Electoral Areas A-H (RDN, 2015b, para 2) (Figure 6).

In 2007, the RDN developed a Drinking Water – Watershed Protection Action Plan that called for a regional response to issues that had been identified in its seven major watersheds. These concerns were related to land development pressures, agricultural and forestry practices, water consumption rates, and contamination of drinking water sources by pollutants from failing underground storage tanks (FBC, 2015, p. 36; RDN, 2007, p. 1; RDN, 2015d).

Intended to be implemented over a ten-year time frame, the Drinking Water–Watershed Protection Action Plan proposed a series of goals and objectives arranged around the following seven key initiatives (RDN, 2007, p. 5):

1. Public awareness and involvement,
2. Water resources inventory and monitoring,
3. Management of land-use and development,
4. Watershed management planning,

5. Management of water use,
6. Management of water quality, and
7. Adapting to climate change.

The projected budget was \$4.57 million over the ten-year horizon; and, to fund these activities, the Action Plan proposed the implementation of an earmarked flat-rate parcel tax (pp. 28-29).



Figure 6 Regional District of Nanaimo, British Columbia
 Source: Regional District of Nanaimo, 2015b.

In 2008, during a referendum held concurrently with local government elections, the Drinking Water–Watershed Protection Action Plan was approved by 53% of the electorate (FBC, 2015, p. 37). In this manner, RDN became the first Regional District in British Columbia to adopt a Drinking Water and Watershed Protection (DW-WP) Service, and the first to fund this type of watershed governance program with a flat-rate parcel tax of \$8 per parcel per year (FBC, 2015, p. 37; RDN, 2011, p. 8). The goal of the DW-WP Program is to “help protect water resources by ensuring land-use decisions reflect the need to protect water resources, and by educating and empowering residents to protect water today and for the future” (RDN, 2010, p. 5).

Now in its eighth year of operation, examples of the DW-WP Program's activities include the following (FBC, 2015, pp. 36-37; RDN, 2015f, pp. 1-7):

- Initiated the 'Water Budget Project' that includes mapping and research components to understand water availability, water demands, and climate change impacts in each of the seven major watershed areas.
- Expanded ground water and surface water monitoring, and drilled 16 new observation wells.
- Facilitated the development of partnerships with other government agencies and local stewardship groups for watershed data collection.
- Through its 'Team Water Smart' has provided community education opportunities on xeriscaping, rainwater harvesting, and riparian restoration for streamside landowners. It has also implemented watershed field trips for local students in Grades 4 and 5.
- Developed an interactive public website [www.dwwp.ca].

The DW-WP Program employs a Manager and three staff; and, it has an annual budget of approximately \$467,000 (RDN, 2015a, p. 371), which is augmented by project-specific grants received from senior governments (FBC, 2015, p. 37). It receives advice from a Technical Advisory Committee, which meets quarterly and is comprised of 19 members who serve two-year terms. These Committee members represent a range of interests including: three provincial government ministries (i.e. Environment, Forestry Lands and Natural Resource Operations, and Transportation), the regional Health Authority, the four constituent municipalities, various industry stakeholders (i.e. forestry contractors and water purveyors), technical experts, environmental advocacy groups, and academia (RDN, 2015c). The RDN Board has final decision-making responsibilities regarding DW-WP Program activities.

5.4 OKANAGAN BASIN WATER BOARD, BC

Situated in central British Columbia, the Okanagan Basin is a semi-arid watershed that stretches approximately 200 kilometres in length from Armstrong at its northern point, through a series of six lakes, and culminates near Osoyoos (Figure 7) (OBWB, 2011, p. 7). Beyond the Okanagan Basin, the watershed continues across the US Border, runs into the Columbia River, and eventually flows into the Pacific Ocean near Portland, Oregon (OBWB, 2015c, para 4). Renowned for its orchards, vineyards and tourist destinations, the Okanagan Basin covers over 8000 square kilometres and is home to approximately 354,000 people (OBWB, 2011, p. 7; BC Stats, 2014).

Beginning in the 1960's, the Okanagan Basin experienced increased concerns about water quality and water scarcity (OBWB, 2010, p. v). There was growing pollution in the lakes from failed sewage systems, effluent from cattle yards, and runoff from insecticides used in the fruit orchards (OBWB, 2015e, para 1). Additionally, a highly invasive aquatic weed (Eurasian Milfoil) was damaging fish and wildlife habitat, as well as interfering with tourism, water-based recreation and shoreline aesthetics (OBWB, 2015b, paras 1-4). Finally, the attractiveness of the area's climate was causing significant expansion of its population base and corresponding pressures on its water supply systems.

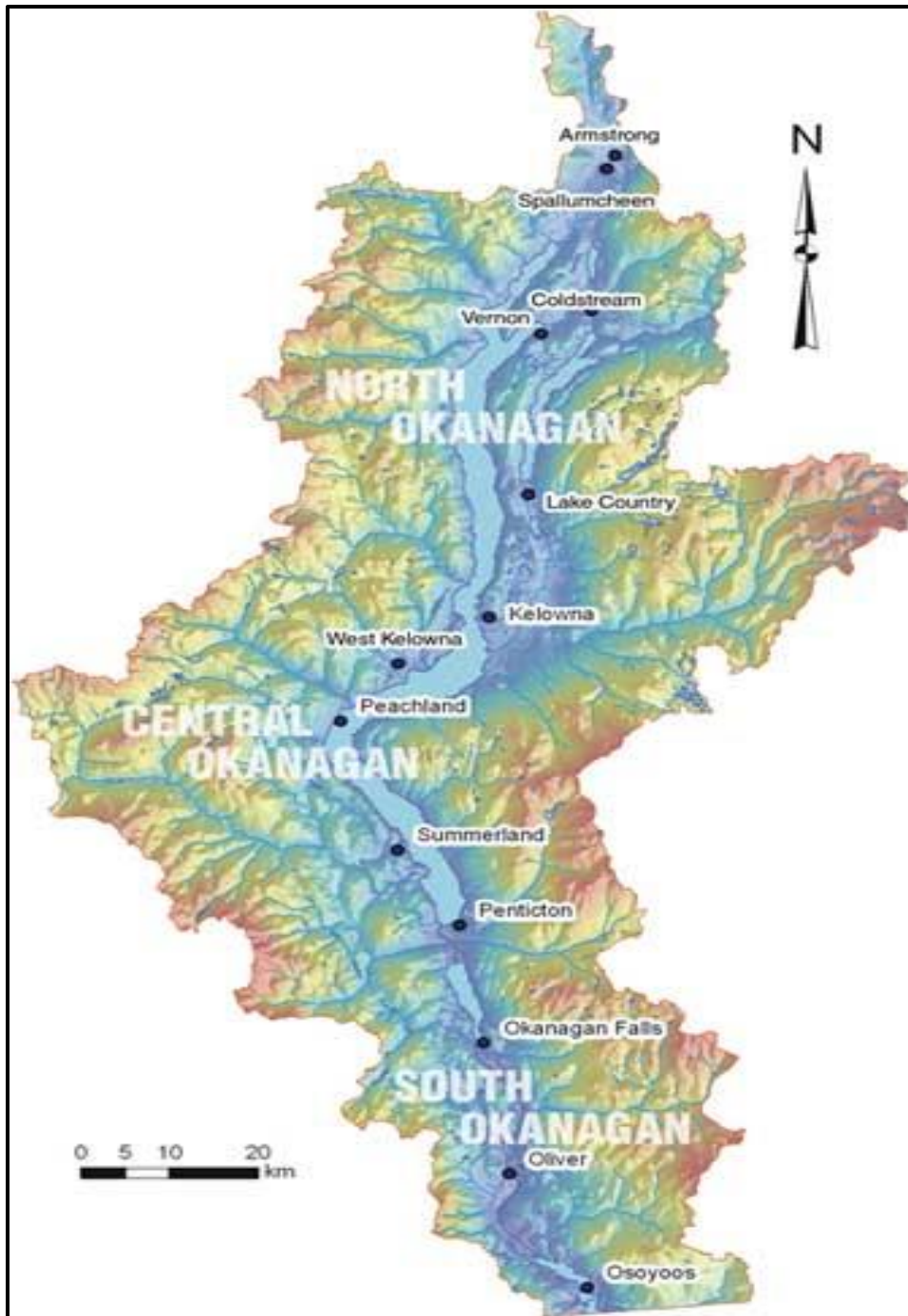


Figure 7 Okanagan Basin, British Columbia
 Source: Okanagan Water Wise, 2015.

In response to these concerns, the OBWB was incorporated in 1970 under Section 138 of the *Municipalities Enabling and Validating Act* (MEVA). Its creation allowed for cross-jurisdictional collaboration on water management issues between the three Regional Districts of the Okanagan Valley: North Okanagan, Central Okanagan, and Okanagan-Similkameen (OBWB, 2010, pp. 1-2). Also, the issuance of Supplementary Letters Patent (SLPs) permitted the

direct taxation on assessed property values within the three Regional Districts to fund the OBWB's activities (OBWB, 2010, p. 14; Fraser Basin Council, 2015, p. 28).¹²

The vision of the OBWB is “to have a sustainable water system, meeting the needs of residents and agriculture while supporting wildlife and natural areas – now and in the future” (OBWB, 2010, p. 2). In its current iteration, the OBWB has three primary activity streams: the Sewerage Facilities Assistance Grant Fund, which issues grants to municipalities within the Basin to improve their sewage system infrastructure; the Eurasian Milfoil Control Program, which addresses the bi-annual milfoil treatment processes; and, the Water Management Plan, which focuses on watershed-wide initiatives such as: communication, data gathering, information sharing, education, conservation, long-term planning, and conflict resolution (Nowlan & Bakker, 2007, p. 110; OBWB, 2013, p. 7; FBC, 2015, p. 31).

The OBWB is governed by a 12-member Board of Directors who serve one-year terms. Each of the three Regional Districts appoints three Directors; and, a single Director is appointed from each of the following three organizations: the Okanagan Nation Alliance, the Water Supply Association of BC, and the Okanagan Water Stewardship Council (OBWB, 2010, pp. 4-5).

In 2006, the Okanagan Water Stewardship Council was created as a permanent Standing Committee of the OBWB Board and serves as a technical advisory panel (OBWB, 2010, pp. iv-vi, & 9). Meeting on a monthly basis and comprised of over two dozen stakeholders from diverse perspectives (i.e. federal departments, provincial ministries, municipalities, academia, agriculture, forestry, health, and water purveyors), the Council has provided opportunities for dialogue and leadership on various initiatives (FBC, 2015, p. 31; OBWB, 2015a, p. 19).

Now in its 46th year of operation, the OBWB's 2015 Annual Report (p.18) indicated an operating budget of approximately \$3.8 million derived from property tax levies (91%); project-specific grants from various sources such as federal Gas Tax, BC Water Funders, and Royal Bank of Canada's Blue Water Project (7%); and, interest / other income (2%). Expenditures were classified as sewerage facilities assistance grants, water management program activities, and funding for the UBC-Okanagan Research Chair position (57%), contract services for water management and the Eurasian Milfoil control program (13%), Board and Council remuneration and expenses (2%), wages and benefits for the seven full-time staff (16%), and various operating / overhead expenses (12%).

5.5 BOW RIVER BASIN COUNCIL, ALBERTA

The Bow River Basin is one of the most significant watersheds in Alberta. Measuring over 645 kilometres in length and covering an area over 25,000 square kilometres, it flows from glacial headwaters in the Rocky Mountains, past Lake Louise, Banff, Canmore, and Calgary until its confluence with the Oldman River, and then eventually into Hudson Bay (Figure 8) (BRBC, 2010b, paras 1-6).

¹² The SLPs and their subsequent amendments permit the following taxes: a levy not to exceed \$0.21 per \$1000 of net taxable property value for the Sewerage Facilities Assistance Grant Program; a levy for the Water Management Program is capped at \$0.02 per \$1000 assessed property value; and, the combined costs of the Eurasian Milfoil Control Program and the Water Management Program levies must not exceed \$0.36 per \$1000 assessed property value (OBWB, 2010, pp. 13 & 23).

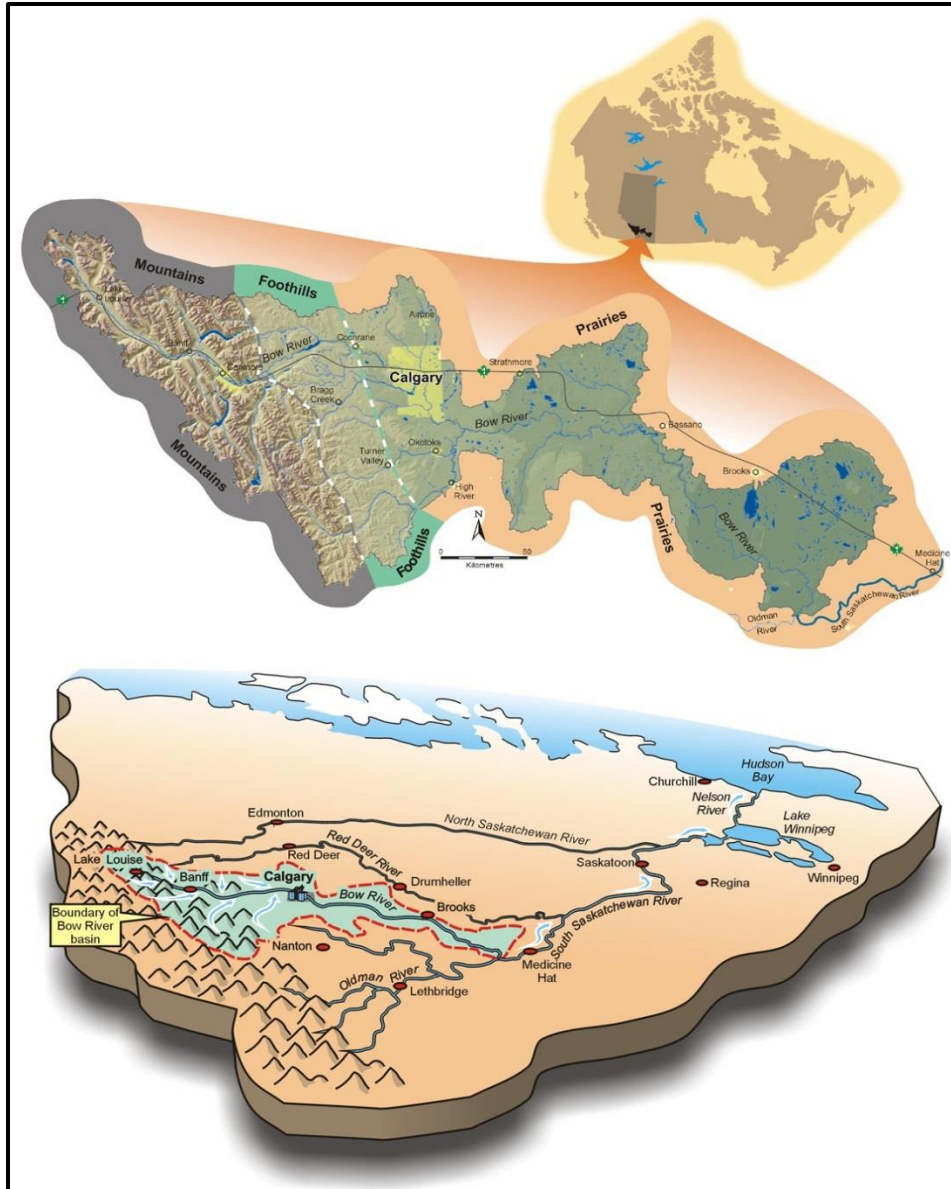


Figure 8 Bow River Basin, Alberta
 Source: Bow River Basin Council, 2010b.

The watershed is home to over 1.3 million people - fully one-third of Alberta's population - who reside in 22 urban municipalities, 12 rural municipalities, three Irrigation Districts and three First Nations reservations (Alberta Water Research Institute [AWRI], 2010, p. 4). It is described as the province's most highly populated basin; and, with its "13 dams, 4 weirs, and 8 reservoirs" is also the most regulated river in all of Alberta (BRBC, 2010b, para 8).

In the past 150 years, demands on the Bow River Basin from urban and economic growth, agriculture, irrigation, tourism, and recreation have escalated (BRBC, 2010a, p. 4). The presence of hydroelectric generation infrastructure in the Upper Bow and Kananaskis sub-basins has damaged riparian zones and threatened aquatic species (pp. 13-14). Water quality, particularly downstream of Calgary, has become degraded due to sediments from glacial wastage, storm water discharges, agricultural runoff, and effluent leakages (p. 3). Water allocations, through the

issuance of water licences, account for 70% of the river's average annual natural flow (p. 5), and there are concerns that climate change-related drought will further impact water availability.

The Government of Alberta's approach to watershed governance is articulated in its 2003 'Water for Life Strategy'. The Strategy's three main goals are safe, secure drinking water; healthy aquatic ecosystems; and, reliable, quality water supplies for a sustainable economy (Alberta Ministry of Environment and Parks, n.d.c., para 1). The Strategy establishes partnerships at three different yet integrated spatial scales. At the province-wide scale, the Alberta Water Council is a non-profit council comprised of 25 members from various industries, government departments, and non-government organizations that provide non-binding advice to the Government of Alberta (Alberta Ministry of Environment and Parks, n.d.a., para 3). At the watershed level, each of the 11 Watershed Planning and Advisory Councils (WPACs), shown in Figure 9, are independent non-profit organizations tasked with collaborative multi-stakeholder consultation, planning, and facilitation of stewardship activities

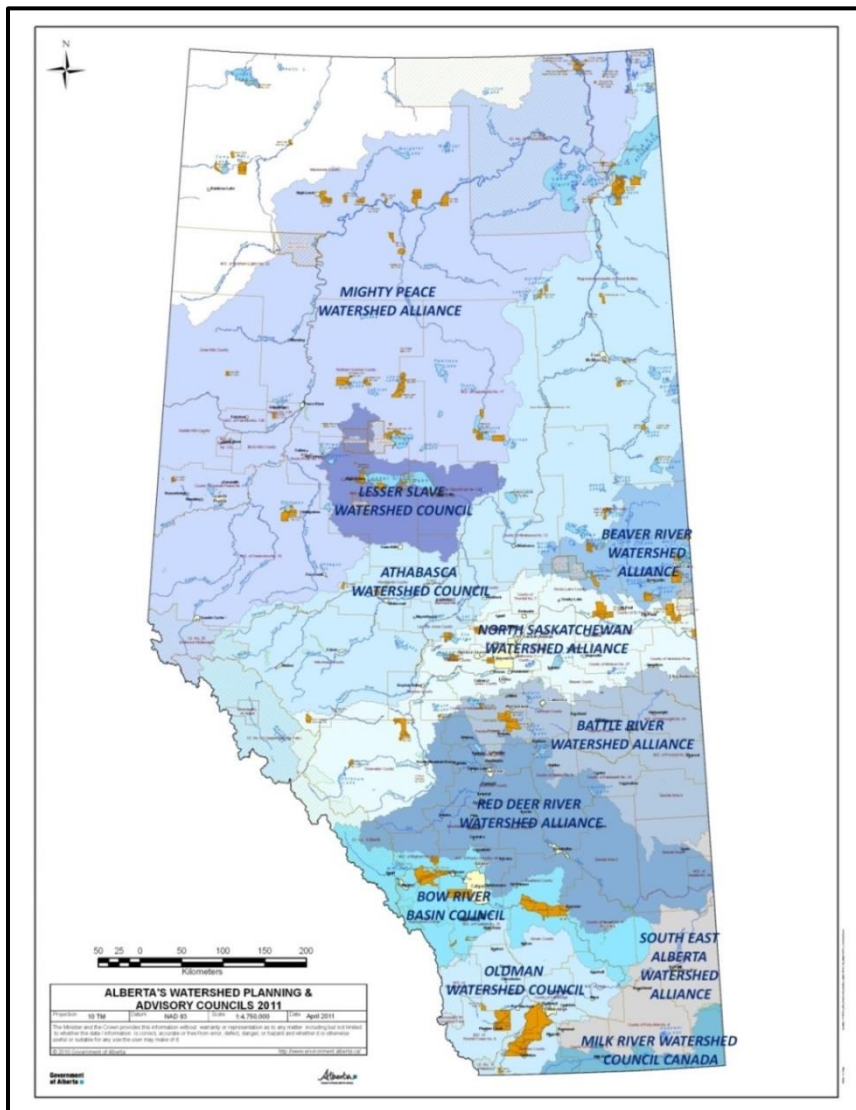


Figure 9 Alberta's Watershed Planning and Advisory Councils, 2011
Source: Alberta Ministry of Environment and Parks, n.d.d.

Each WPAC is required to conduct activities in four key areas: education and outreach; environmental stewardship; watershed evaluation and reporting, and watershed management planning (Alberta Ministry of Environment and Parks, n.d.d., para 5). An important deliverable for each WPAC is the creation of a Water Management Plan, which once approved, becomes binding (Nowlan & Bakker, 2007, p. 96). At the local level, watershed stewardship groups are engaged in a variety of conservation and preservation activities (Alberta Ministry of Environment and Parks, n.d.e., para 1). The WPACs play a pivotal role in the ‘Water for Life Strategy’ in that they provide leadership and technical assistance to the watershed stewardship groups in their regions; and, they also have a voice in the province-wide Alberta Water Council.

The BRBC was initially established in 1992 as an advisory body to the Alberta Ministry of Environmental Protection in response to concerns about water quality in the Bow River (Nowlan & Bakker, 2007, p. 96). In 2004, after the adoption of the ‘Water for Life Strategy’, the Government of Alberta designated the BRBC as the Watershed Planning and Advisory Council (WPAC) for the entire Bow River Basin (BRBC, n.d.b., para 3). The Council is a “multi-stakeholder, charitable organization dedicated to the conservation and sustainable use of the ecological goods and services of the Bow River, its tributaries, and the landmass considered its watershed” (BRBC, 2010a, p. 5). Its vision is that the “Bow River Basin will be one of the best-managed watersheds in the world” (BRBC, 2012, p. 4), and its mission is to improve and protect the Bow River’s “riparian zones, aquatic ecosystems, quality and quantity of water, and [mitigate] effects of land use on surface and groundwater” (BRBC, n.d.b., para 7).

The BRBC is governed by a 14-member Board of Directors elected annually on staggered two-year terms (BRBC, 2012, p. 24). Directors are representative of the six membership categories: Commercial / Industrial, Municipal Government, Individual Public Members, Water Licensees, Nonprofit / Academia, and finally, Regulatory, Administrative, and First Nations (BRBC, 2012, pp. 24-27). The Council has three full-time employees and over 300 active members. Based on their 2014 Annual Report, the BRBC received revenues of \$392,000 derived from provincial grants (67%), municipal grants (22%), individual memberships, donations and in-kind donations (6%), corporate donations (3%), and interest income (2%). Expenditures were classified as wages (70%), operational (24%), and projects (6%) (BRBC, n.d.a., p. 9).

5.6 NISQUALLY RIVER COUNCIL, WASHINGTON

The Nisqually River originates in the Nisqually Glacier on the south slope of Mount Rainier, flows 130 kilometres, and enters South Puget Sound at the Nisqually Wildlife Refuge near Olympia, WA (NRC, n.d.b., paras 2-3; NRC, 2009, pp. 8-9; Ryan & Klug, 2005, p. 497). Encompassing an area of approximately 1870 square kilometres and home to over 69,000 residents, the basin includes three hydroelectric generation dams, as well as the communities of Ashford, Elbe, Mineral, Eatonville, McKenna, Roy, Yelm, the Fort Lewis Military Reserve, and Nisqually Indian Tribe lands (Figure 10) (Batker, de la Torre, Kocian, & Lovell, 2009, p. 8)

In 1985, the Nisqually River Task Force was created by the Washington State legislature to study concerns over the allocation of water rights, water consumption, water quality, and loss of fish and wildlife habitat in the basin (Nisqually River Task Force, 1987, pp. 2-3). In 1987, after two years of stakeholder consultations, the Task Force produced the Nisqually River Management Plan, which contained 160 recommendations including the establishment of the NRC to oversee the Plan’s implementation (NRC, 2009, p. 5). Beginning in 2003, a review of the original management plan resulted in the adoption of the Nisqually Watershed Stewardship Plan, which

established a series of updated goals and objectives spanning the next fifty-year horizon (NRC, 2009, p. 6).

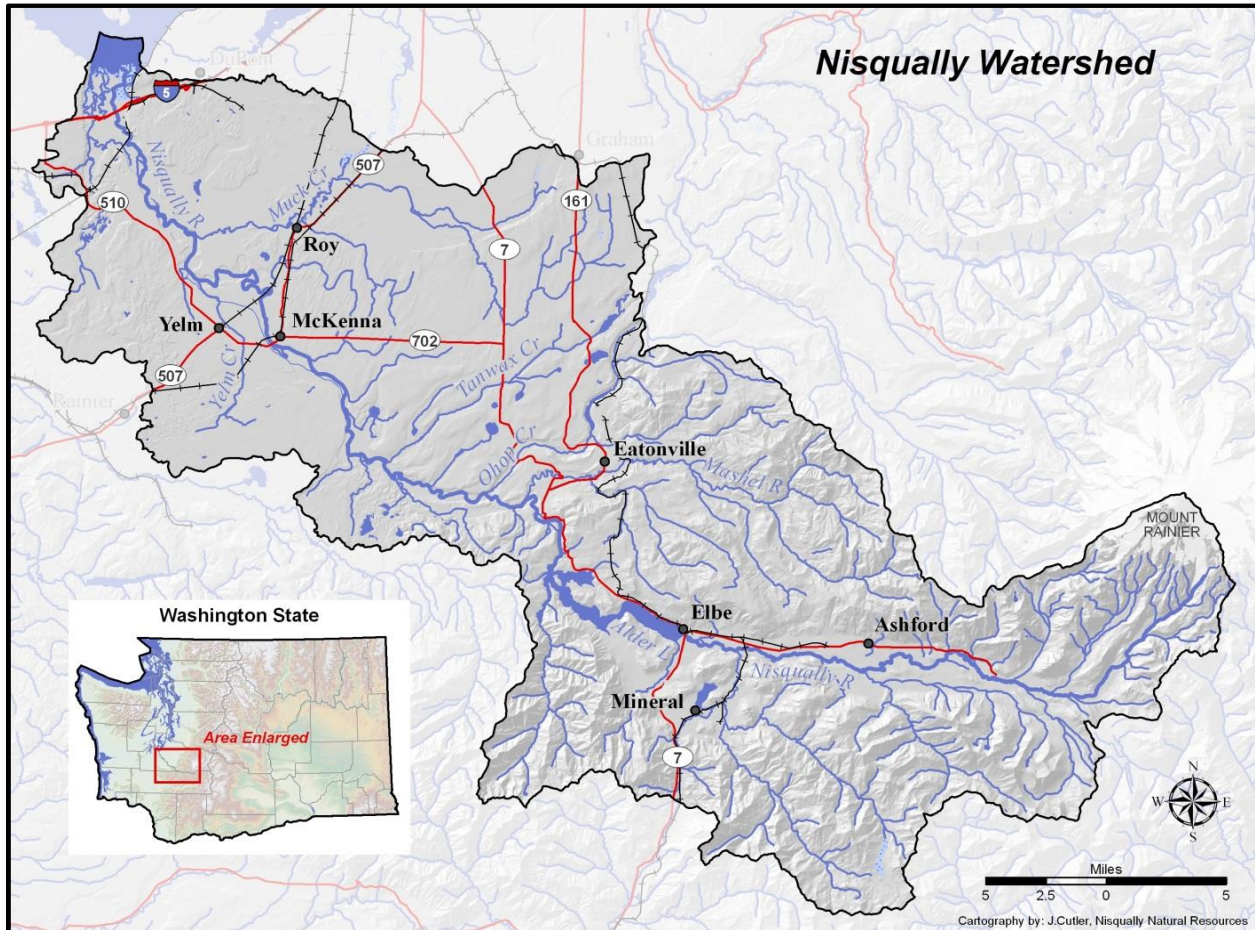


Figure 10 Nisqually Watershed, Washington State
Source: Nisqually River Council, n.d.f.

The NRC is a “non-regulatory coordination, advocacy, and education organization” (NRC, n.d.g., para 1), whose mission is to “encourage and support sustainability in the Nisqually watershed in order to steward the resources in perpetuity and build a model for harmonious living” (NRC, 2009, p. 11). In its current iteration (Figure 11) it is comprised of 24 members representing federal, state, county and local governments, Nisqually Indian Tribe, Mount Rainier National Park, Nisqually National Wildlife Refuge, as well as various forestry, hydroelectric generation and academic interests (NRC, 2009, pp. 47-48). Also, the Citizen’s Advisory Committee holds three voting seats on the Council and is comprised of local landowners, business, and concerned citizens (NRC, n.d.g., para 3).

There are three main program areas of the NRC. The Nisqually River Education Program works to raise awareness of watershed issues with residents, educators, and students (NRC, 2009, p. 45). The Nisqually Stream Stewards enlists volunteers for conservation and restoration work in the basin (NRC, 2009, p. 44). The Nisqually Sustainable program recognizes local businesses who adopt environmentally sustainable practices and encourages residents to shop at these ‘Nisqually Sustainable’ certified businesses (NRC, n.d.d., paras 7-8).

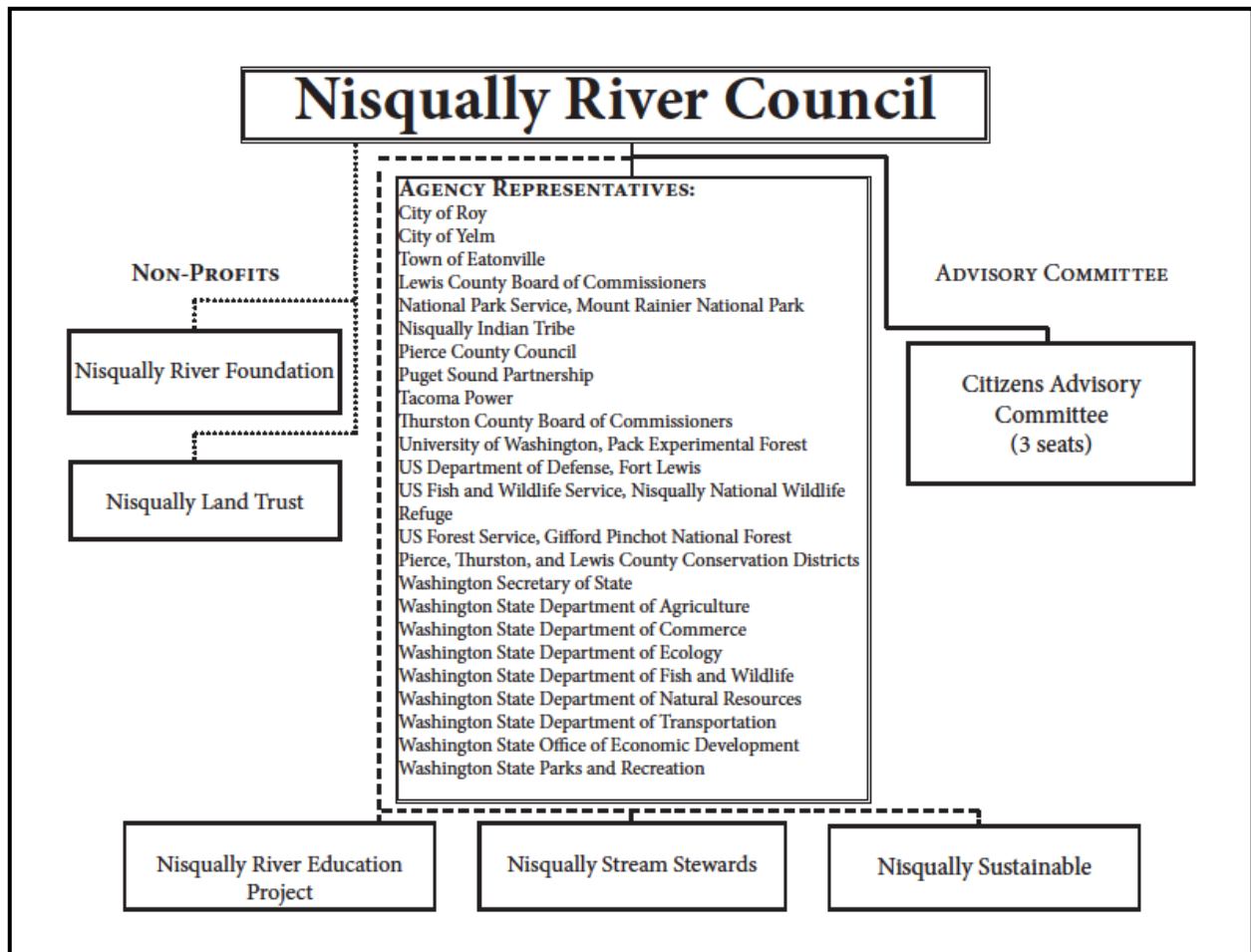


Figure 11 Organizational Structure, Nisqually River Council
 Source: M. Greene, personal communication, September 24, 2015.

The NRC does not have its own funding. Instead, two non-profit organizations support the NRC in its activities: the Nisqually Land Trust and the Nisqually River Foundation. In 2013, the Nisqually Land Trust had three part-time employees and an operating budget of \$1.4 million USD derived from grants, donations and fundraising efforts that were used primarily for land acquisition and conservation projects (82%), and operational overhead (18%) (Nisqually Land Trust, 2014, p. 7).

The Nisqually River Foundation (NRF) provides three full-time staff who coordinate the Council’s programs and manage the federal, state, local grants and private donations used for project funding (NRC, 2009, p. 6). In 2013, the multi-year State funding contract expired, and since then the Foundation has experienced difficulties in securing financing for its core operations, programs, and projects (M. Greene, personal communication, September 24, 2015). In 2015, the NRF’s budgeted income of \$733,300 USD was received from government grants or contracts (66%), previous year’s operating surplus (17%), company or foundation grants (16%), and private donations (1%) (M. Greene, personal communication, September 24, 2015). The NRF’s budgeted expenses for 2015 were \$591,300 USD, which included direct program delivery costs (i.e. contract employees, labour, and incidentals) (57%), own payroll (38%), and operational overhead (5%) (M. Greene, personal communication, September 24, 2015).

The Nisqually Watershed ecosystem is estimated to produce goods and services valued between \$287 million to \$4.2 billion USD annually (Batker et al., 2009, p. 5). A recent study by Stanton, Flores & Batker (2014) indicated that in order to protect the value of this natural asset, ongoing investment is required to ensure its continued health; and specifically, that the NRC would require an additional \$3 million dollars USD annually to fund its Nisqually Watershed Stewardship Plan over the next 50 years (p. 13). The study proposed the implementation of six alternate funding mechanisms so that the cost of protecting the Nisqually Watershed was shared between those who reside in the watershed and those who benefit from it. The six proposed funding mechanisms included the following (Stanton et al., 2014, pp. 35-40):

- *Watershed Protection Fees*: This mechanism is considered for implementation by both drinking water utilities and hydroelectric utilities located in the basin, and would see ratepayers billed either a flat rate per billing cycle or a sliding volumetric rate based on actual consumption (pp. 35-36).
- *Watershed Stewardship Fees*: This mechanism is considered for visitors to the Mount Rainier National Park and the Nisqually National Wildlife Refuge, and would be a voluntary contribution on a per person or a per vehicle basis in addition to the admission fees currently collected (p. 36).
- *Special Assessments*: This mechanism focusses on the approximately 41,775 land parcels within the Nisqually Watershed, and proposes either a flat rate of \$15 per parcel, or a rate ranging from \$0.001 to \$0.10 per \$1000 USD assessed property value (p. 37).
- *Watershed Investment District*: This mechanism considers the creation of Watershed Investment Districts in Washington State as governing bodies with taxation authority comprised of elected officials and tribal interests from within the district (p. 38).
- *Puget Sound Regional Restoration Fund*: This mechanism considers the creation of a regional restoration fund that assesses fees to marine cargo traffic that utilize the Ports of Seattle and Tacoma. Fees collected in this manner would be distributed to maintain port infrastructure, and to support the watersheds, including the Nisqually, which drain into the Puget Sound Basin (p. 39).
- *Corporate Give Back Fund*: This mechanism considers the development of marketing strategies aimed at corporations who benefit from being located in the Nisqually Watershed such as “Patagonia, Microsoft, Nordstrom, Amazon, Costco and Wilcox Family Farms” and encouraging them to increase their corporate giving programs (p. 40).

The report estimates that the combination of the first three funding mechanisms would generate approximately \$3.15 million USD annually (p. 37), and would be sufficient to meet the NRC’s long-term needs. The remaining options are feasible but would require legislative amendments or new governance structures, as well as broad support from across the entire watershed (p. 37).

5.7 GRAND RIVER CONSERVATION AUTHORITY, ONTARIO

Located in southwestern Ontario, the Grand River is the province’s largest watershed and spans an area of approximately 6800 square kilometres. From its source near Dundalk to its terminus into Lake Erie near Port Maitland, the Grand River is joined along its 300 kilometre length by four major tributaries: the Conestogo, Speed, Eramosa, and Nith Rivers; and, two lesser ones: the Fairchild and Whitemans Creeks (GRCA, 2012, p. 5) (Figure 12).

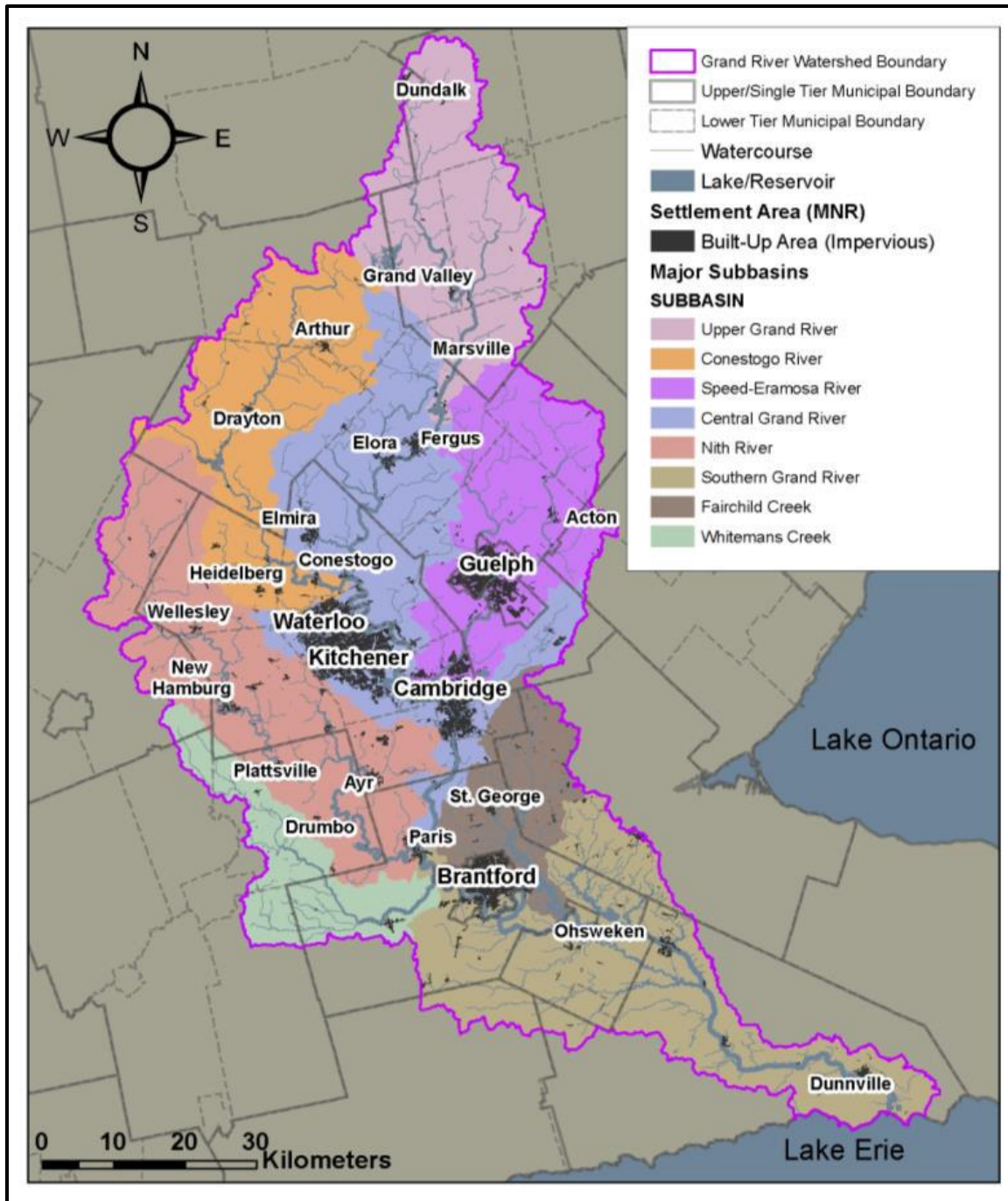


Figure 12 Grand River Watershed, Ontario

Source: Grand River Conservation Authority, 2014b, p. 2-1.

Spanning the later part of the 19th and early 20th centuries, a combination of poor forestry and agricultural practices caused widespread flooding, soil erosion, and water quality degradation throughout the Grand River basin (FBC, 2015, p. 33; GRCA, 2012, p. 3). In 1932, eight municipalities joined out of their shared concern for the Grand River, and formed the Grand River Conservation Commission. In doing so, they became the “first watershed management agency in Canada” (FBC, 2015, p. 33; Nowlan & Bakker, 2007, p. 89).

Building on its experience with the Grand River Conservation Commission and also using the example of the Tennessee Valley Authority model, Ontario passed the *Conservation Authorities Act* in 1946. The Act provided opportunities for two or more municipalities in a common watershed to form partnerships and to pursue joint natural resource management programs (Nowlan & Bakker, 2007, p. 89). The intent of the legislation was three-fold: to promote local initiatives to solve watershed-related problems; to provide a framework for technical assistance and cost-sharing between the provincial government and the partner municipalities; and, to grant jurisdiction to newly established Authorities to issue land-use regulations (Conservation Ontario, n.d., paras 5-7).

The Grand Valley Conservation Authority was created in 1948; and, in 1966 it amalgamated with the original Grand River Conservation Commission to form what is now the GRCA (FBC, 2015, p. 30; GRCA, n.d.c., paras 13-16). In 1994, the Grand River and tributaries received a Canadian Heritage River designation (GRCA, 2012, p. 6).

In its current iteration, the GRCA is home to more than 1 million persons who reside in 39 municipalities and two First Nations reserves (FBC, 2015, p. 30; GRCA, n.d.a., para 1; GRCA, 2015, p. 1); and, it employs 128 full-time and 313 part-time staff (Canada Revenue Agency, n.d.). It is governed by a 26 member Board who are appointed for three-year terms that coincide with the municipal election cycle (GRCA, 2014a, p. 1). The allocation of Board representatives is stipulated under the *Conservation Authorities Act* and is apportioned based on a percentage of the population so that larger municipalities have multiple representatives (i.e. Regional Municipality of Waterloo has ten members) and smaller municipalities share one representative (GRCA, 2014a, p. 2). Representatives are mostly elected officials from participating municipalities, and occasionally are key community stakeholders (GRCA, 2014a, p. 1).

The GRCA's vision is for a "healthy and sustainable natural environment in the Grand River watershed" (GRCA, 2012, p. 2). Its mission is to:

- "develop and implement programs [that will] improve water quality, reduce flood damages, maintain a reliable water supply, facilitate watershed planning, protect natural areas and biodiversity, and provide environmental education,
- be an environmentally responsible provider of outdoor recreation opportunities, and
- maintain a responsive, innovative, accountable and financially sustainable organization" (GRCA, 2012, p. 2).

Accordingly, its activities are classified into seven areas: "reducing flood damages, improving water quality, maintaining reliable water supply, protecting natural areas and biodiversity, watershed planning, environmental education, and outdoor recreation" (GRCA, 2015, p. 1).

Funding for the GRCA's activities has shifted in recent years. In the 1930s – 1940s, 75% of the money for the construction of dams and reservoirs along the length of the Grand River came from federal and provincial infrastructure grants (FBC, 2015, p. 34). Additional transfer payments from the provincial government assisted with "administration, conservation, and recreation activities [and] represented a significant and relatively stable source of funds" (Mitchell, Priddle, Shrubsole, Veale & Walters, 2014, p. 464). However, since the early 1990s, funding from senior governments has either been eliminated, reduced, or become more restricted in terms of approved functions (p. 464). To address these shortfalls, the GRCA has increased its self-generated income (Mitchell et al., 2014, p. 464), and has raised its per capita municipal levy from \$7.37 in 2005 to its current rate of \$10.39 in 2015 (GRCA, 2015, p. 18).

The ability to generate revenue from a range of sources allows the GRCA to fulfill its mandate (GRCA, 2015, pp. 1-2). It continues to access provincial and municipal cost-sharing arrangements for infrastructure projects. It charges levies on property taxes or water bills to the residents of constituent municipalities. It charges user fees for accessing GRCA owned lands (i.e. cottage lot rentals, campsite fees or park entrance fees) (pp. 39–40). It sells hydroelectric power from three dams – the Shand, Conestogo, and Guelph (p. 40). It charges permit fees for building developments in the Grand River floodplain (p. 5). It uses Reserve funds to help bridge costs over fiscal years (p. 5). Finally, it solicits private-sector funds from individuals, corporations, and foundations through fundraising, donations, and grants (p. 1). The GRCA’s 2015 Budget indicated revenues of \$29.5 million from the following sources: self-generated (47%), municipal levies (36%), senior government grants (10%), reserves (4%), and ‘other’ (3%) (GRCA, 2015, p. 6). Its expenditures were categorized as operating budget for maintenance and corporate services (80%), capital infrastructure programs (9%), and special projects (11%) (GRCA, 2015, p. 7).

There are 36 Conservation Authorities (CAs) (Figure 13) that provide watershed management services to almost 13 million persons, representing 90% of Ontario’s population (Conservation Ontario, 2015, p.1). Conservation Ontario is a non-profit association that serves as the voluntary network to “advise, support and assist all conservation authorities in Ontario in achieving their objectives and to act as a liaison between the government of Ontario” (Mitchell et al., 2014, p. 471). Conservation Ontario is not created by the *Conservation Authorities Act*, nor does it receive funding from the provincial government; instead, it receives operating grants from its constituent members (Ontario Ministry of Natural Resources and Forestry [OMNRF], 2015, p. 11).

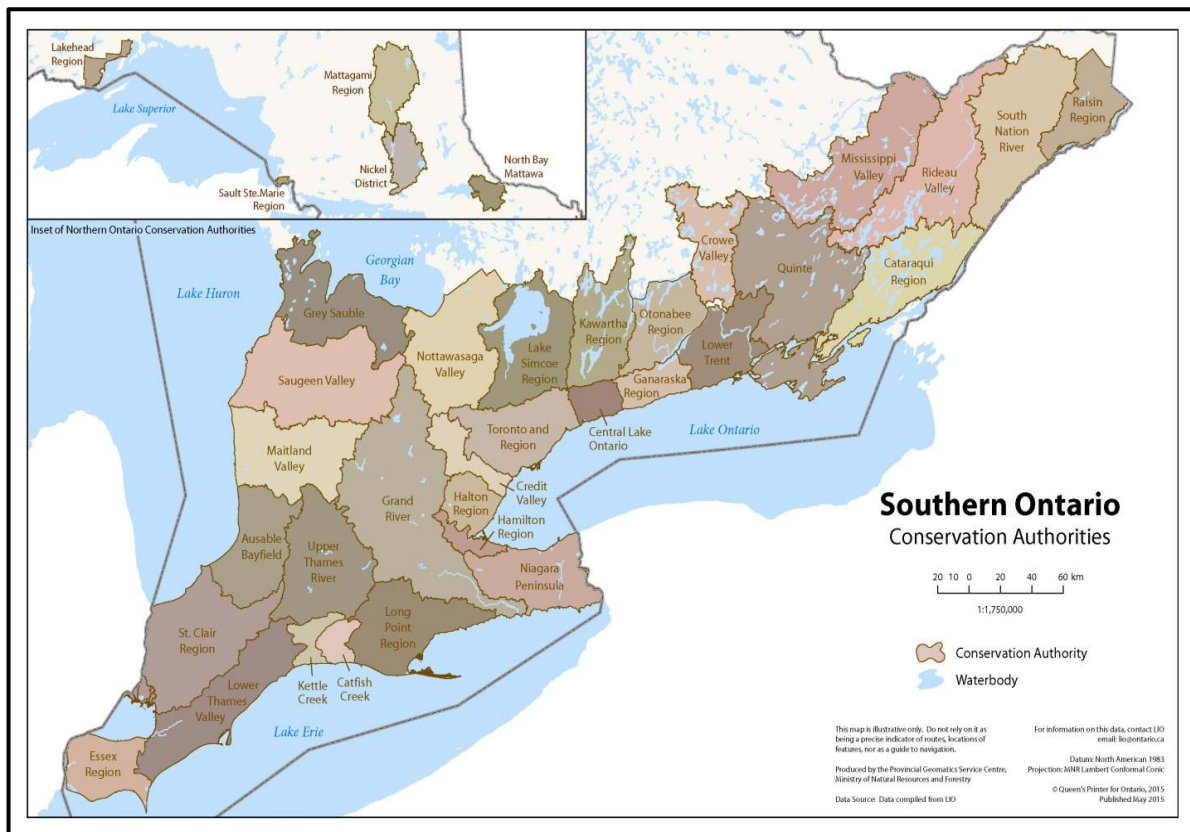


Figure 13 Ontario’s Conservation Authorities
Source: Ontario Ministry of Natural Resources and Forestry, 2015, p. 4.

In the past 70 years, CAs have played a central role in watershed management across Ontario. There is increased awareness that the complexity of responding to climate change, extreme weather events, expanding population, and shifting regulatory requirements (i.e. such as the development of the *Clean Water Act*, 2006 stemming from the Walkerton drinking water tragedy) are creating new pressures. There is also recognition that differences in sizes, budgets, and institutional capacities are causing disparities in the types and levels of activities being provided by the various CAs (Mitchell et al., 2014, p. 461).

In July 2015, Government of Ontario announced a consultation process to review the “roles, responsibilities, funding and governance of conservation authorities under the *Conservation Authorities Act*” (OMNRF, 2015, p. 1). In May 2016, the report ‘Conserving Our Future’ confirmed the relevance of the CA model as well as highlighted “the importance of managing natural resources at the watershed scale”(OMNRF, 2016, p. 2). The next consultation period will focus on responding to the proposed renewal priorities, which include developing improvements in the following areas: accountability in decision-making, consistency in roles and responsibilities, collaboration and engagement among stakeholders, and modernizing funding mechanisms (p. 2).

5.8 HOOGHEEMRAADSCHAP VAN RIJNLAND, NETHERLANDS

Originally formed in 1248, the HvR is the oldest of the Netherlands’ 24 regional water authorities. Bordered by the North Sea on the west, it covers an area of 1,100 square kilometres including the communities of Gouda, Harlem, IJmuiden, Leiden, and Wassenaar; and, with approximately 700 employees provides services to over 1.3 million residents (HvR, n.d.b., para 2-3). In Figure 14, the HvR appears as ‘12 – Rijnland’.

The role and composition of the Dutch regional water authorities have evolved considerably over the last eight centuries. In their current iteration, they are products of the 2009 *National Water Act* and subsequent legislative amendments (OECD, 2014b, p. 18). With a collective mandate to ensure “Droge voeten, schoon water” or “Dry feet and clean water”, their respective borders reflect geographical or water features such as catchment basins, canals, weirs, and dikes; and, they often cross municipal or provincial boundaries (Havekes, et al., 2015, p. 12).

Regional water authorities are financially self-sufficient forms of local governance responsible for the management of ground and surface water systems, water quality and quantity, wastewater treatment, ecosystem protection, navigable waterways, and flood defence (Dutch Water Authorities [DWA], 2014, p. 2; HvR, n.d.b., para 4; OECD, 2014b, p. 31). Of note, drinking water distribution is not performed by the water authorities. Instead, this function is done by private water supply companies whose shares must be publicly owned. In this manner, they are deemed semi-public organizations (Havekes et al., 2015, p. 25). Also, each regional water authority works in partnership with other levels of governments (i.e. national, municipal, and adjacent authorities) as well as with stakeholders from various sectors such as agriculture, commerce, environmental advocacy, industry, recreation and tourism (HvR, n.d.b., para 14).

WATERBEHEER 24 Waterschappen

2014

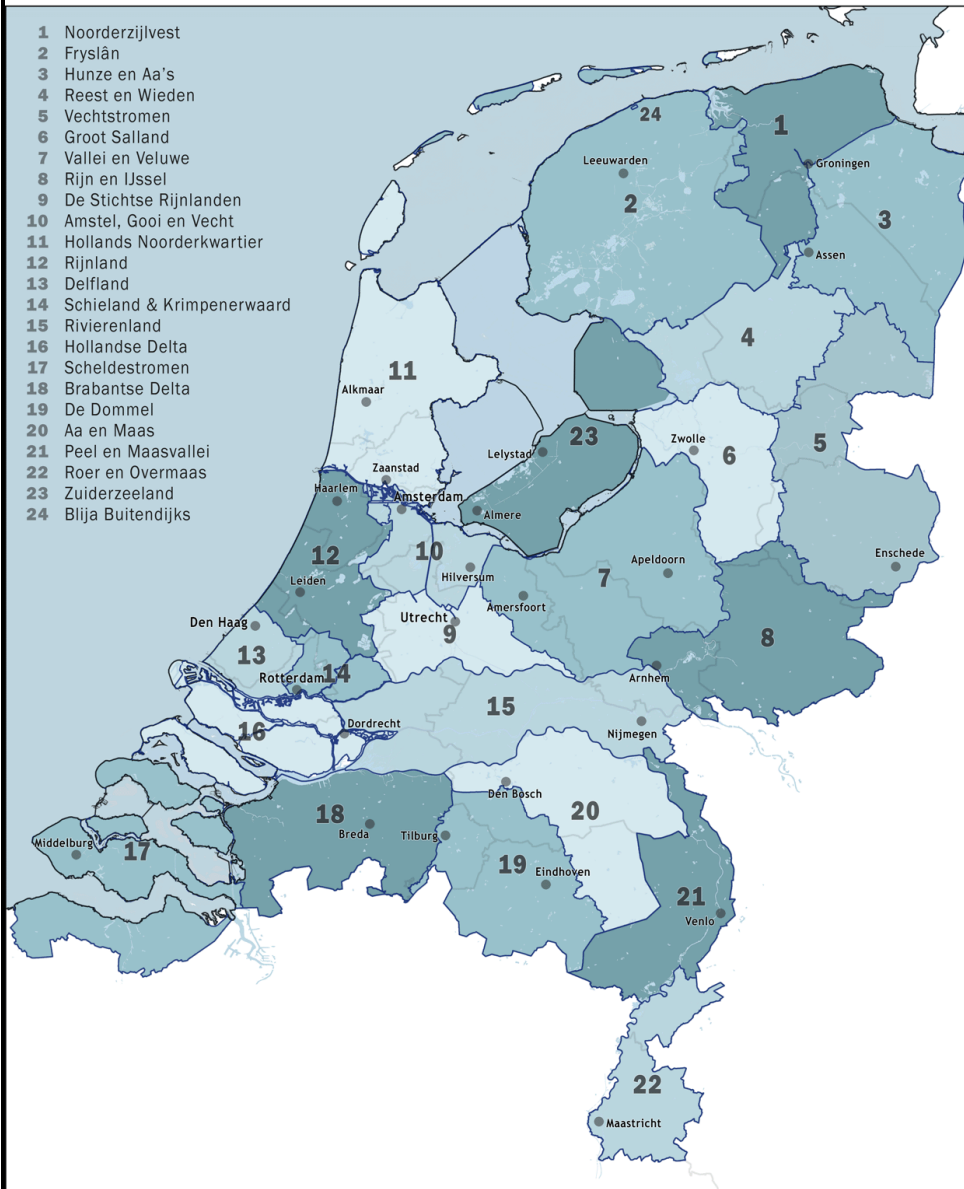


Figure 14 Regional Water Authorities, Netherlands

Source: van Aalst, 2014.

Each regional water authority is governed by a Board that is elected every four years. Based on the ‘interest-pay-say’¹³ principle, the size and composition of each Board is specified in local bylaws and is intended to be representative of key stakeholders (DWA, n.d., para 5; Havekes et al., 2013, p. 88; Havekes et al., 2015, p. 31). Boards are empowered to create bylaws, issue permits, enforce compliance through administrative punishments or criminal code charges, and set annual tax rates to finance their activities (Havekes et al., 2015, pp. 15 & 20). In 2014, the

¹³ This adage intends that those who benefit from the activities and infrastructure of the water authority must pay for those services, and in turn, are entitled a proportionate say in its governance (Lazaroms & Poos, 2004, p. 137).

Board of the HvR consisted of 30 members, of which 21 represented ‘Residents’, four were ‘Owners of Open Land’ (i.e. farmers), four were ‘Businesses’, and one was selected for ‘Owners of Nature Areas’ (i.e. tourism or recreation areas) (Havekes et al., 2015, p. 33).

The financing of regional water authority activities is designed to ensure full cost-recovery and is derived mostly from two sources: sewage system treatment taxes, and water system taxes (OECD, 2014b, p. 208). Using the polluter pays principle, individual households and businesses pay a sewage tax based on a ‘per unit pollution fee’ (v) to finance the collection and treatment of wastewater. For example: residential dwellings and small businesses that discharge less than 44 cubic meters per annum are charged at a rate of 1v; larger businesses that discharge between 44–218 cubic meters are charged at a rate of 3v; and, a higher rate is charged to those that discharge in excess of 218 cubic meters (Belastingsamenweking Gouwe-Rijnland [BSGR], n.d.a., paras 1-3). Based on the user pays principle, property owners also pay a ‘water system levy’ that is used to finance the following: water quality and quantity, water distribution systems, riparian restoration, and flood protection through the maintenance of dunes, dikes and quays (Havekes et al., 2015 pp. 39 - 40). The water system tax is comprised of building charges and three land-usage rate categories (i.e. green spaces, roads, and ‘other’) that are charged on a per hectare basis (BSGR, n.d.b. para 2; OECD, 2014, p. 211). On average, a family in low-lying Netherlands expects to pay approximately €300¹⁴ annually in the various forms of regional water authority taxes (Havekes et al., 2015, p. 61).

In 2014, the HvR regional water authority had operating revenues totaling €193.2 million. Of this, combined revenues from the water system and pollution taxes accounted for €163.8 million (85%); revenues from permit fees was €20.7 million (11%); and, other sources provided €8.7 million (4%) (HvR, 2014, p. 28-29). The 2015 tax rates are set as follows: the Purification Tax is €47.25 per unit of pollution; and the Water System charges include €102.91 per living space, and land-usage rates that range from €4.00 - €303.08 per hectare (HvR, n.d.a., chart).

A unique feature of the Netherlands’ approach to financing water governance is the financial institution Nederlandse Waterschapsbank (NWB).¹⁵ Formed in 1954 in response to the catastrophic floods of the previous year, the NWB is a ‘borrowing alliance’ used exclusively by the Dutch regional water authorities and other local government organizations to access low-cost financing for infrastructure projects related to water management, education, and public health (Havekes et al., 2015, p. 52; OECD, 2014, pp. 211-212; Rees, et al., 2008, p. 31).

5.9 SUMMARY

This section reviewed seven watershed governance organizations. Using Hooper’s (2005) typology as an analytical framework, it examined how they functioned, how they were financed, and what activities they undertook. The two case studies from British Columbia were the Regional District of Nanaimo (RDN) and the Okanagan Basin Water Board (OBWB). The three examples from other Canadian provinces included the Bow River Basin Council (BRBC) in Alberta, the Grand River Conservation Authority (GRCA) in Ontario, and the Clean Annapolis River Project (CARP) in Nova Scotia. The international cases included the Nisqually River Council (NRC) in Washington State, and the Hoogheemraadschap van Rijnland (HvR) Regional Water Authority in the Netherlands.

¹⁴ Based on August 12, 2016 exchange rate (€1 = \$1.45 CDN), this represents \$435 CDN per annum.

¹⁵ The Nederlandse Waterschapsbank is also known as the Dutch Water Bank.

Each watershed organization was the product of its unique external and internal contextual situation. Consequently, there was much diversity in terms of hydrological basins, geographical sizes, population bases, stakeholders, legislative frameworks and internal institutional arrangements. Table 8 summarizes key features of the seven case study watershed organizations.

Table 8 Features of Case Study Watershed Organizations

Type / Acronym	Advisory / Association	Advisory / Corporation	Corporation	Council	Council	Authority	Authority
	CARP	RDN DW-WP	OBWB	BRBC	NRC	GRCA	HvR
Year Created (current / original)	1990	2008 1967	1970	2004 1992	1987	1966 1932	2009 1248
Length (km)	126	n/a	200	645	130	300	n/a
Drainage (km ²)	2,250	2,035	8,000	25,000	1,870	6,800	1,100
Population (000s)	124	147	354	1,300	69	1,000	1,300
Budget (000s)	\$627	\$467	\$3,800	\$392	\$733 ₁₆	\$29,500	€193,200 ₁₇
Staff	5 FT 12 PT	4 FT	7 FT	3 FT	3 FT	128 FT 313 PT	~700 FT

It was noted that the magnitude of the drainage basin did not automatically correlate to the size of the organization's annual budget. For example, the Bow River Basin Council had the largest drainage basin (i.e. 25,000 km²) yet the smallest budget at \$392,000; whereas, the HvR Regional Water Authority had the smallest area (i.e. 1,100 km²) and the largest budget at €193.2 million.

Despite the significant variation in the relative ages of the case study watershed organizations – ranging from less than a decade to almost eight centuries old – the most common impetus for their creation were concerns about contaminated drinking water and environmental degradation. Other contributing factors included unsustainable water consumption, the need for flood protection, and the allocation of water licences. Table 9 lists the most common triggers for the establishment of each of the seven case study watershed organizations.

¹⁶ The Nisqually River Foundation (NRF) coordinates and funds all activities of the NRC.

¹⁷ Based on August 12, 2016 exchange rate (€1= \$1.45 CDN), the HvR's annual budget is approximately \$280 million CDN per annum.

Table 9 Triggers for the Establishment of Case Study Watershed Organizations

Type / Acronym Triggers	Advisory / Association	Advisory / Corporation	Corporation	Council	Council	Authority	Authority
	CARP	RDN DW-WP	OBWB	BRBC	NRC	GRCA	HvR
Contaminated drinking water	✓	✓	✓	✓	✓	✓	✓
Unsustainable water consumption		✓	✓	✓	✓	✓	✓
Degraded aquatic and riparian habitats	✓	✓	✓	✓	✓	✓	✓
Flood protection						✓	✓
Participation in Federal program	✓						
Rejected as Canadian Heritage River	✓						
Invasive aquatic weeds			✓				
Allocation of water licences				✓	✓		

The funding sources for each of the seven case study watershed organizations are summarized in Table 10. These sources included the collection of property or parcel taxes; tariffs charged to users in the form of fees for water consumption, wastewater disposal, or development permits; and, transfers comprised of grants from various levels of government, corporate or philanthropic agencies, as well as donations from community fundraising. Also, there were self-generated revenues including interest income, membership sales, hydroelectric sales, and park entrance charges. It is noted that, with the exception of the HvR Regional Water Authority, which derived its revenues exclusively from taxes and tariffs, the remaining six case study watershed organizations were reliant on a mix of funding arrangements to finance their activities. Of these, the GRCA had the most diverse revenue stream of taxes, tariffs, and transfers, as well as almost half of its annual budget (47%) was gained through self-generated income from the sale or use of owned resources. Finally, it was also noted that the watershed organizations who received higher percentages of their budgets from direct taxes or tariffs appeared to have greater operational stability (Dinar et al., 2005, p. 41).

Table 10 Funding Sources for Case Study Watershed Organizations

Type / Acronym	Advisory / Association	Advisory / Corporation	Corporation	Council	Council	Authority	Authority
	CARP	RDN DW-WP	OBWB	BRBC	NRC	GRCA	HvR
Funding Sources							
Budget (000s)	\$627	\$467	\$3,800	\$392	\$733	\$29,500	€193,200
Taxes							
Property / Parcel Taxes		✓	✓			✓	✓
Tariffs							
Water Use Fees						✓	✓
Wastewater Fees							✓
Permit Fees						✓	✓
Transfers							
Senior Government Grants	✓	✓	✓	✓	✓	✓	
Regional/ Local/ Tribal Government Grants				✓	✓		
Grants - Corporate / Foundations	✓		✓	✓	✓	✓	
Donations / Community Fundraising	✓			✓	✓	✓	
Self- Generated							
Interest Income			✓	✓		✓	
Memberships	✓			✓			
Hydroelectric Sales						✓	
Lot Rentals						✓	
Park Entrance / Camping Fees						✓	

Table 11 displays the diverse range of watershed activities for each of the seven case study organizations. The most common activities related to governance and resource stewardship were: community education, conflict resolution, cross-jurisdiction coordination, ecosystem restoration /protection, water quality monitoring, and watershed management planning. Less common activities related to infrastructure responsibilities were: flood protection, maintenance of navigable waterways, stormwater and wastewater management services.

Table 11 Types of Activities for Case Study Watershed Organizations

Type / Acronym	Advisory / Association	Advisory / Corporation	Corporation	Council	Council	Authority	Authority
Activities	CARP	RDN DW-WP	OBWB	BRBC	NRC	GRCA	HvR
Governance							
Community Education	✓	✓	✓	✓	✓	✓	✓
Conflict Resolution		✓	✓	✓	✓	✓	✓
Cross-jurisdiction Coordination		✓	✓	✓	✓	✓	✓
Resource Stewardship							
Ecosystem Restoration / Protection	✓	✓	✓	✓	✓	✓	✓
Water Quality Monitoring	✓	✓	✓	✓	✓	✓	✓
Watershed Management Planning	✓	✓	✓	✓	✓	✓	✓
Recreation Services						✓	
Infrastructure							
Flood Protection						✓	✓
Navigable Waterways							✓
Storm Water Management						✓	✓
Waste Water Management							✓

The findings from the seven case study watershed governance organizations will be combined with the themes from the literature review (Section 3) and the key informant interviews (Section 6) and discussed in Section 7.

6.0 KEY INFORMANT INTERVIEWS

6.1 INTRODUCTION

This section provides an overview of the results from the key informant interviews. The interviews served to elicit a better understanding of sustainable financing options for watershed governance organizations from subject-matter experts currently active in the field. Using the recruitment process outlined in Section 2.4, a total of 20 key informants were contacted by email (see Appendices A and B for recruitment materials) and invited to participate in the research project. Table 12 illustrates the classification of invited key informants by sector: government, watershed organizations, and non-governmental organizations / others.

Table 12 Summary of Key Informants Contacted by Sector

Summary of Key Informants Contacted by Sector		<i>n</i>	%
Government	6	Senior government – 5%	30
		Local government – 25%	
Watershed organizations	5	Watershed organizations – 25%	25
NGOs / Others	9	NGOs – 25%	45
		Consultants – 15%	
		Academia – 5%	
Total	20		100

Note: NGOs = Non-governmental organizations.

Of the 20 potential participants, a total of eight persons ($n=8$) completed the interview process, representing an overall response rate of 40%. The remaining individuals were either: interested but unavailable ($n=2$), declined with thanks ($n=3$), or did not respond to the invitation to participate ($n=7$). Table 13 shows the distribution of participants across the three sectors: government, watershed organizations, and non-governmental organizations / others.

Table 13 Summary of Participants by Sector

Summary of Participants by Sector		<i>n</i>	%
Government	3	Senior government – 0%	37.5
		Local government – 37.5%	
Watershed organizations	3	Watershed organizations – 37.5%	37.5
NGOs / Others	2	NGOs – 0%	25
		Consultants – 12.5%	
		Academia – 12.5%	
Total	8		100

Note: NGOs = Non-governmental organizations.

The Semi-Structured Interview Guide (Appendix C) was used to ensure a consistent approach to the interviews and to facilitate the transcription process. Each participant was assigned the initials WG and a single digit identifier representing the sequence number of their interview (i.e. WG1, WG2). Appendix D lists the participants' interview codes by sector. Participants were

invited to review their draft interview record. All eight participants vetted their interview transcript for completeness and accuracy before it was used in the thematic analysis process.

A summary of the interview findings along with sample comments is presented in the subsections below. The first subsection summarizes the participants' viewpoints on watershed governance. The second subsection describes their perspectives on sustainable financing of watershed governance. The third subsection discusses current financing options used for watershed governance in British Columbia, including the corresponding successes and challenges of these mechanisms. The fourth subsection explores potential financing options for watershed governance in British Columbia.

6.2 WATERSHED GOVERNANCE DEFINED

Participants were asked to describe their perspectives on watershed governance. Table 14 highlights their responses. Only two participants explicitly prefaced their comments by referring to the watershed as being formed by the natural hydrological basin. The majority of participants spoke of the challenges associated with watershed boundaries transcending political jurisdictions and needing to balance the interests of multiple stakeholders. There was a consensus among participants that watershed governance is complex and comprised of several facets. First, it includes the legislation, institutional structures, and policies that make up the governance framework. Second, the community culture, values, and beliefs must be reflected in the decision-making processes. Third, there is an expectation that decision-makers will act in the long-term best interests of all (i.e. humans and the environment) to ensure healthy and sustainable watersheds. Sample responses included the following:

The watershed transcends political boundaries. In our watershed, we have three levels of local government (i.e. regional, local and First Nations), five provincial ministries (i.e. Aboriginal Relations, Agriculture, Community Sports and Cultural Development, Environment, and Forestry Land and Natural Resource Operations), and two federal departments (i.e. Fisheries and Oceans, and Aboriginal Affairs and Northern Development Canada). So watershed governance is bringing all these players together – acting in the best interests of a sustainable and healthy watershed – and meeting the needs of the environment as well as the humans who live and thrive in the watershed (WG2).

It includes legislation, regulation, and policies. It is the social networks, behaviors, and values of the people responsible for the decision-making. The key word is governance – the process of decision-making and making choices (WG3).

It is the actual laws that form the rule sets. It's the cultural patterns that determine what people want to do. It's the community processes that weigh how policies are shaped and applied. It's a continual process of building agreement among the different groups (WG4).

It means taking a 'whole-of-watershed' collaborative approach and focusing on the health and sustainability of the entire watershed – not just on the multitude of decisions for agriculture, mining, or forestry (WG5).

It means the whole spectrum of activities regarding the management and oversight of the watershed. It covers everything from influence to decision-making (WG6).

Table 14 Watershed Governance Defined

Watershed Governance Defined	<i>n</i> =8	%
Watersheds are defined by their hydrological basins.	2	25
Watershed boundaries cross political jurisdictions and stakeholder interests.	5	62.5
Watershed governance reflects laws, institutional structures, and policies.	5	62.5
Watershed governance reflects community values and decision-making processes.	5	62.5
Watershed governance means acting in the long-term best interests of all.	5	62.5
Watershed governance means honouring First Nations' worldviews.	2	25
Watershed governance means having sufficient delegated authority to act.	2	25

Two participants addressed the importance of having meaningful local decision-making presence combined with sufficient delegation of authority from the provincial government. Two participants spoke of the importance of being inclusive of First Nations' communities and worldviews, particularly their multi-generational resource stewardship approach to watershed governance. One of these participants stated in part:

[Watershed governance is] about a sense of spirit, ancestry and the meaning of water as part of the totality of living. [It is not just] management, regulations and policies – what we would call governance structures. [It is] expressing them through water and landscape in a continuous and meaningful way. [It is] continuity with the past and continuity with the future, along with a sense of compassion, empathy and humbleness, and recognition that we need to work with others and to share the resource with others. That is watershed governance. It is much more to do with collective responsibility than it is with the structures of power and order, which is how the Western approach tends to define governance (WG8).

6.3 SUSTAINABLE FINANCING OF WATERSHED GOVERNANCE DEFINED

Participants were invited to describe their viewpoints on sustainable financing of watershed governance. As noted in Table 15, the majority of participants began their response to this question with outlining the challenges of inadequate or unstable financing currently faced by watershed governance organizations. In recent decades, they have observed both federal and provincial governments to be 'in retreat.' Senior governments have addressed their own deficits through wide-scale reductions in services or funding, and consequently, are less able to assist with regional watershed governance issues. Concurrently, local governments have been reluctant to assume new watershed responsibilities or raise property taxes to pay for them. Further, all three local government participants expressed frustration at the inability to access a portion of provincial water licence revenues to fund their watershed activities. Sample comments included the following:

The federal and provincial governments have been in retreat since the mid-1990s. We have seen an incredible reduction in resources [to local governments] due to [senior governments'] heavy debt levels. There is no mechanism in place [for local governments] to share in the provincial water licence fees. This is an issue unto itself. The Province is not receiving enough revenue to [support its own costs] or to share with [local governments] (WG2).

In recent years, there has been the perception of provincial downloading of responsibilities without financial resources; and, a corresponding reluctance of local governments to step into the vacuum (WG7).

Local governments try to avoid raising taxes for new functions (WG1).

Table 15 Sustainable Financing of Watershed Governance Defined

Sustainable Financing of Watershed Governance Defined	<i>n</i> =8	%
Current challenges – retreat of senior governments, limited access to financing mechanisms, and reluctance to implement new local taxes.	6	75
Financing needs to be adequate, accessible and ongoing.	8	100
Financing will likely be from multiple sources and be task-specific.	7	87.5
Financing will likely be augmented through leveraging partnerships.	3	37.5

Further noted in Table 15, there was consensus among participants that sustainable financing must be adequate, accessible and ongoing. It requires taking a long-term perspective; and, revenue streams will likely be received from multiple sources to accomplish specific tasks. Three participants spoke of the importance of maximizing available funding through developing and leveraging financial partnerships with like-minded organizations. Sample replies included the following:

Sustainable financing means adequate and ongoing (WG2).

A watershed governance body can be many things: a local government body, or a provincial agency that's self-financing, or a collaborative body that brings [several groups] together and may not be self-financing. So, the question is, what are you financing? Is it for planning? Or, is it operational for short-term projects or long-term implementation of activities in the watershed? Financing is for the full spectrum of activities – everything from simple planning work to building new waste water treatment plants. It's strategic through to operational. Moreover, sustainable implies over an extended time frame – multiple years, even decades. The problem is that often the funding is not sustainable. Its one-off allocations by senior governments or funding agencies to do a little work that just gets you started; and, [it's insufficient] given the magnitude of challenges facing watersheds across the province (WG3).

Sustainable funding can be characterized as affecting the core operations of the watershed organization: administration, overhead and other necessary roles such as coordination, liaison, communication and engaging with different partners and stakeholders. This is different from funding that is needed for habitat restoration

or a defined planning project where it might be easier to get dedicated funds or a grant to undertake a particular task. The phrase refers to sources of funding that endure over time – have long-term certainty - and are not vulnerable to political whims or the pendulum swings of public support (WG5).

We rely primarily on money from local taxation, and to a lesser degree, grants. We focus on developing partnerships to get things done. One example of this is that we needed to get a better understanding of the health of our surface water. We allocated a portion of grant money to purchase equipment. Ministry of Environment provided the training on the equipment and oversaw the data management function. A local stewardship group provided the personnel to collect the samples. It has been a very successful three-way partnership. When we started, it was a first in the province - it had never been done that way before. As a result of this partnership, in the past four years, we have monitored 51 sites in our watersheds (WG7).

6.4 CURRENT FINANCING OPTIONS FOR WATERSHED GOVERNANCE IN BC

Participants were asked to discuss current financing options used for watershed governance in British Columbia, and offer insights into successes or challenges with these mechanisms. Table 16 summarizes the identified financing mechanisms. The top three funding sources included: transfers from senior governments for planning or infrastructure projects (i.e. Gas Tax Funding); direct taxation by local governments in the form of property or parcel taxes; and, either flat-rate or volumetric rate-based user fees for water distribution or wastewater services. The next most frequently cited sources were grants from conservation trusts, which disburse fees received from surcharges applied to fishing, angling or hunting licences (i.e. Pacific Salmon Foundation or Habitat Conservation Trust Fund); and, grants from either corporate or philanthropic agencies who utilize investment income to support watershed management or stewardship projects (i.e. Real Estate Foundation of BC, Royal Bank of Canada’s Blue Water Project, or Vancouver Foundation). Three participants noted examples of donations in the form of community fundraising, crowdsourcing, or planned bequests. One participant provided an example of a public-private partnership in the form of the Lake Cowichan weir, which is owned /operated by Catalyst Paper Crofton Division and managed jointly with the Cowichan Watershed Board.

Table 16 Current Financing Options for Watershed Governance in BC

Current Financing Options for Watershed Governance in BC		<i>n=8</i>	%
Source	Financing option		
Taxes	Local government – property or parcel taxes	7	87.5
Tariffs	Local government - water distribution /wastewater user fees	6	75
Transfers	Federal / provincial - grants for planning or infrastructure	7	87.5
	Conservation trusts - grants for conservation projects	5	62.5
	Corporate or philanthropic – grants for planning or stewardship	5	62.5
	Donations – community fundraising, crowdsourcing, or bequests	3	37.5
	Public – private partnerships (P3s)	1	12.5

Table 17 highlights the participants' comments on the successes or challenges related to the utilization of these current financing options. There was a consensus among participants that viable watershed governance organizations would access a range of funding mechanisms. Of the potential sources, the most stable were deemed to be local government property /parcel taxes and user fees, which could then be directed to support core administrative functions. However, acquiring local government tax dollars was dependent on having political and public support, and on navigating the associated referendum or alternate approval process.¹⁸ Implementation of taxes and users fees was considered more likely if there were clear links between the source (i.e. the payer), the financing option, and the intended outcome. Grants, whether from corporations, philanthropic agencies, or conservation trusts were also considered a significant form of revenue. The process of grant writing, and in some cases the reporting requirements, were deemed to be time-consuming. Several participants expressed challenges with grant eligibility criteria and the restrictions on grant monies needing to be spent on set projects within a specific time frame. Several participants articulated limitations with crowdsourcing. One participant provided examples of how accessing certain financing options had been problematic for their watershed organization. In two separate circumstances, their affiliation with local government and their start-up status precluded them from applying for grants. As well, their affiliation with local government prevented the use of crowdsourcing to fund a riparian restoration project. Sample replies included the following:

Financing options such as public-private partnerships, grants, and crowdsourcing have their place in terms of catalyzing work, doing initial planning and getting projects going. However, if you want sustainable financing over a period of years or decades, then you have to have the power to tax; and, that power is at the local and senior levels of government. It can be in the form of [transfers from] resource rents, extra tariffs on water allocations, or general revenue (WG3).

Where funds are collected at the local level and reinvested at the local level, there are clear links to the benefits and possibly a greater willingness to pay (WG5).

Base funding through property taxes is essential. It provides steady low-level input that pays for staff, rent, and overhead. Staff can then write grant applications, develop partnerships, and find external funding to do additional projects (WG4).

Grants have been a significant source of funding - sometimes from federal departments such as Department of Fisheries, or others such as the Pacific Salmon Foundation. We have been successful in cobbling together different grants [to achieve various projects]. Grants, now and in the future, will be an important source of revenue, but writing grant proposals is a job unto itself (WG1).

Grants are not consistent over time. There is no guarantee that the money will be there in the long term. When there are fluctuations in funding, it's hard to manage long-term programs. At least with property or parcel tax money, there is security

¹⁸ Authorized under the *Community Charter*, the 'Alternative Approval Process' (AAP) is considered a less expensive process than referendums for local governments to solicit public approval; and, they are typically used for long-term borrowing initiatives that fall outside municipal election cycles (BCCSCD, n.d.a., para 1).

in knowing that it is stable. [We] can move ahead with certainty and achieve what [we've] set out to do (WG7).

Accessing grants has been difficult for two reasons. One, we are closely linked with local government. Two, the grant criteria are not always tailored to start-ups. Also, we considered crowdsourcing for [a riparian restoration] project but decided that with our connection to [local government] it was not a good option (WG6).

Crowdsourcing is not sustainable. It depends more on how you can pick a message and run with it. Then, it becomes very much like grant writing (WG4).

Crowdsourcing may not instill a sense of community or citizen responsibility. Yes, the money may come through but only from a small percentage of the society (WG2).

Crowdsourcing or other forms of social impact investing are best suited to appealing one-off projects where there are clear, tangible outcomes. This is very hard to articulate for year-to-year funding of governance activities (WG5).

Table 17 Successes and Challenges with Current Financing Options in BC

Successes and Challenges with Current Financing Options		<i>n</i> =8	%
Successes	Viability means accessing a range of funding mechanisms.	7	87.5
	Most stable source is local government property taxes /user fees.	7	87.5
	Likelihood of public and political support increases when clear links between source (i.e. payer), financing option, and outcome.	6	75
	Grants represent a significant source of revenue.	6	75
Challenges	Referendums or alternative approval processes may be expensive, time-consuming, and potentially unsuccessful.	6	75
	Grant applications and reporting requirements may be onerous.	5	62.5
	Grant eligibility and usage criteria may be restrictive.	5	62.5
	Soliciting donations or crowdsourcing is not a steady source of revenue and in some cases may not be acceptable.	4	50

6.5 POTENTIAL FINANCING OPTIONS FOR WATERSHED GOVERNANCE IN BC

Participants were asked to identify potential financing options for watershed governance in British Columbia and to suggest considerations for moving the policy discussion forward. As noted in Table 18, the majority of participants identified the most likely future sources as accessing a portion of provincial water licence revenues, and the implementation of property taxes /parcel fees or specific user fees in jurisdictions where they were currently not in use. An important consideration in their responses was the importance of adequately charging for water as a finite commodity. Several participants expressed interest in the expanded use of public-private partnerships (P3s); however, they also voiced the perceived limitations of P3s as being suitable for infrastructure or operations-related work only, rather than for administrative or governance functions. One participant identified the potential of payments for environmental services (PES) but also reflected on the challenges inherent in the scope of changes required to implement that type of framework. One participant drew attention to the innovative approach in Town of Gibson's 'Eco-Asset Strategy' to incorporate natural assets alongside infrastructure

assets in their Asset Management Plan with the intent of eventually including them in their municipal budget. Sample replies included the following:

Fundamentally, we need to get watershed governance right, and there is a chance for a fresh start with the *Water Sustainability Act* (WSA). We need locally-based inclusive governance models that involve cooperative and collaborative relationships with local, regional, First Nations, provincial and federal governments. The source of the funding is not as important as the adequacy; and, there must be clear responsibility, accountability and transparency associated with the funding. Decisions about sources of financing – such as water licence fees, taxes, and grants - will come after the policy decisions have been made about the basic principles. Those who are responsible need to pay; and, those who benefit should also be paying (WG6).

What we have in British Columbia is a failure to charge adequately for water. Whoever extracts water – whether ground or surface - should pay a licence fee that is representative of the value of the commodity. The money could then be collected equitably across the watershed, and then used across the watershed to invest in improvements, protection, and enhancement (WG2).

Sustainability is about due care and attention. It's about having a duty of care to people and all natural life forms, both present and in the future. Moreover, that gives us the basis on which we should finance water. So that when people use water for any reason (i.e. drinking, irrigation, fishing or hydropower), then finance the abstraction of that water in relation to the future duty of care and not just the cost of the withdrawal or the benefit associated with the immediate use of that water. When you are financing these activities, a small levy or contribution would be placed into a fund towards this sustainable duty of care. [This] fee allows for water in the basin to be used for other purposes. So the act of abstracting then becomes the act of sustainable watershed funding (WG8).

Public-private partnerships may be relevant for funding infrastructure projects, perhaps also for operations, but not for governance functions (WG5).

Payments for environmental services (PES) have potential. The challenge would be how to implement them. If [negative externalities] could be integrated into the market or pricing related to the regulatory regime, then we could formally internalize the costs and re-invest that money at the watershed level. It would certainly place British Columbia as a world leader, but it would require many steps to implement that particular framework (WG5).

[We are watching] Town of Gibsons' 'Eco-Asset Strategy', which argues that their natural assets (i.e. their aquifer and forests) should be evaluated and accounted for in their Asset Management Plan in the same manner as their infrastructure assets. This would mean allocating money in the municipal budget to plan for and maintain all assets – natural and man-made (WG1).

Table 18 Potential Financing Options for Watershed Governance in BC

Potential Financing Options for Watershed Governance in BC		<i>n</i> =8	%
Access portion of increased provincial water licence fees or rentals.		7	87.5
Implement property taxes / users fees where currently not in place.		7	87.5
Develop more public – private partnerships (P3s).		4	50
Implement payments for environmental services (PES).		1	12.5
Develop system for evaluation and accounting of natural assets.		1	12.5
Other	Ensure provincial level activities are adequately funded.	2	25
	Permit two or more Regional Districts /municipalities / First Nations to form watershed governance organizations.	7	87.5

Two participants spoke of the importance of economies of scale and ensuring adequate funding for provincial level functions. They stated in part:

While watershed governance organizations advocate for more delegation and funding, some functions should remain at the provincial government level. These functions include inventory, monitoring, and research so that this information can be tracked over time and across watersheds around the province. Next, they need to set minimum standards and objectives. Finally, they need to monitor for compliance and do enforcement activities if required. There are no economies of scale – it is inefficient - if local governments or watershed organizations are each trying to do these functions. Moreover, for the Province to do a good job of these functions, they also need to ensure their own adequate and sustainable financial resources (WG6).

Extra charges for provincial water licence fees or rentals could fund governance and planning work at the watershed level; and, could also be used to fund provincial operations including hydrologists and policy analysts in the Ministries of Environment, and Forestry Land and Natural Resource Operations (WG3).

Seven participants suggested legislative amendments to make it easier for Regional Districts, local governments and First Nations communities to form watershed governance organizations. One participant stated in part:

One possibility would be to amend the *Local Government Act* to establish [watershed governance] organizations that cross between Regional Districts and also permit others to join (i.e. First Nations). The Okanagan Basin Water Board (OBWB) was created under the *Municipalities Enabling and Validating Act* (MEVA) because there was no legislative mechanism to bridge between the three Regional Districts. Otherwise, you could just establish a Service within a single Regional District under the existing legislation - such as the Regional District of Nanaimo’s Drinking Water and Watershed Protection (DW-WP) Service (WG4).

Finally, one participant offered this cautionary opinion:

British Columbia will likely not see a whole-scale change to its water governance structures, similar to Ontario’s Conservation Authorities, unless there is a Walkerton-scale crisis (WG3).

6.6 SUMMARY

This section summarized the findings from the eight key informant interviews representing three sectors: government, watershed organizations, and non-governmental organizations / others.

Participants were asked to articulate their viewpoints on watershed governance and sustainable financing of watershed governance. They described watershed governance as the complex process of decision-making that reflected hydrological basins, jurisdictional boundaries, legislative frameworks, institutional capacities, administrative processes, and community values. They indicated that it also required taking a ‘whole-of-watershed’ approach and being accountable for acting in the long-term best interests of all user groups, stakeholders, and the environment.

Participants highlighted that in order for watershed governance organizations to be viable and effective they needed adequate, accessible and reliable financing; and, that this funding would likely come from multiple sources and be project or task-specific (i.e. governance roles, resource stewardship tasks and infrastructure projects). Forming partnerships with other like-minded organizations was seen as an important method for maximizing available monies.

Participants were asked to discuss current financing options used in British Columbia, including corresponding successes and challenges with these mechanisms. They indicated that the most frequently used funding sources for watershed governance organizations were: transfers from senior governments for planning or infrastructure projects; local government taxation in the form of property or parcel taxes; and, user fees for water distribution or wastewater services. Grants from conservation trusts, corporations, or philanthropic agencies as well as donations from community fundraising or crowdsourcing efforts were also considered to be significant revenue sources. Of the range of potential financing options, the most stable were deemed to be local government property / parcel taxes and user fees; and accordingly, they were best suited for administrative (i.e. intangible) functions. However, due to fluctuations in funding from the various grant and community donation options, these were considered best suited for short-term, operational, or project-based (i.e. tangible) functions.

Finally, participants were asked to identify potential financing options for watershed governance in British Columbia. They spoke of the importance of adequately charging for water as a commodity and proposed accessing a portion of provincial water licence revenues as well as implementing property/ parcel taxes or specific user fees in jurisdictions where they were currently not in use. There was interest in expanding the use of public-private partnerships (P3s), exploring payments for environmental services (PES), curiosity about Town of Gibsons approach to evaluating their natural assets alongside their engineered infrastructure assets, and suggestions for legislative amendments to make it easier for Regional Districts, local governments and First Nations communities to form watershed governance organizations.

The findings from the key informant interviews will be combined with themes from the literature review (Section 3) and jurisdictional scan (Section 5), and further discussed in Section 7.

7.0 DISCUSSION

7.1 INTRODUCTION

The purpose of this report is to examine sustainable financing options for watershed governance in British Columbia. The literature review summarized existing research on watershed governance, financing of watershed governance, and the current status of watershed governance organizations in British Columbia. The jurisdictional scan examined seven watershed governance organizations from British Columbia, Alberta, Ontario, the United States and Europe. Using Hooper's typology as an analytical framework for a comparative case study approach, it catalogued the impetus for each organization's formation, how they are financed, and what activities they perform. The semi-structured interviews with eight key informants from government, watershed organizations, and non-governmental organizations / others, explored their perspectives of watershed governance, as well as discussed current and potential sustainable financing options for watershed governance organizations in British Columbia.

This section responds to the research objective by updating the conceptual framework with the findings identified through the data triangulation processes of the previous sections. It highlights that there is no 'one-size-fits-all' approach to watershed governance models or how they are financed. It examines the contextual variations of watershed governance organizations, their financing options and ranges of activities. It illuminates which governance models best employ the various financing options, and it clarifies the revenue sources that are best suited to the types of watershed governance activities. Finally, it discusses strategies for bridging the financing gap in British Columbia by tapping into alternate revenue streams, and it suggests the need for concurrent water governance reform.

7.2 WATERSHED GOVERNANCE MODELS - NO ONE SIZE FITS ALL

Healthy watersheds are vital for human survival, essential for environmental well-being, and fundamental to economic growth. However, watersheds are increasingly stressed by rising agricultural, industrial and urban demands, and the effects of extreme weather events and climate change. Further, there is understanding of the linkage between water crises and governance crises, and that effective watershed governance is urgently required to improve outcomes for water quality, quantity, and overall ecosystem health.

Since the latter half of the 20th century, emphasis on the hydraulic mission paradigm and the harnessing of watersheds for economic development purposes has shifted towards the more holistic 'thinking like a watershed' decision-making processes of the Integrated Water Resource Management (IWRM) approach. To achieve this, there has been a coincidental drive towards the development of collaborative watershed governance organizations. While it is recognized that watersheds are the preferred spatial scale for water management and governance functions, and that the creation of watershed-scale decision-making organizations is encouraged, this is challenging to accomplish due to the mismatches between hydrographical boundaries and respective jurisdictional or institutional boundaries. As a result, it is noted that there is no 'one-size-fits-all' approach to water governance models (Gupta et al., 2013, p. 40; Rogers & Hall, 2003, p. 35; OECD, 2015, p. 5).

Summarized from the evidence obtained in the literature review, jurisdictional scan, and key informant interviews, Figure 15 expands the logic model that was initially presented in Section 4. It illustrates that watershed governance organizations are unique and influenced by their contextual environments. These factors include the complex aquatic, riparian and terrestrial sub-systems of the hydrological settings, as well as the legislative frameworks, socio-political conditions, administrative structures, institutional capacities, and decision-making processes. Common reasons for the establishment of watershed governance organizations include concerns about contaminated drinking water, unsustainable water usage, environmental degradation, flood protection, and allocation of water licences. As noted in Hooper's typology, watershed governance organizations are products of the levels of delegation from senior governments and have vastly differing mandates. As a result, watershed governance organizations exhibit considerable diversity in their financing sources and functional scope.

Financing for watershed governance organizations is ultimately derived from three main revenue sources: taxes, tariffs, and transfers. Taxes can be in the form of local government property or parcel taxes, or it can be monies received from senior governments via consumptive, income or sales taxes. Tariffs are charged to users in the form of fees for water licences, water consumption, wastewater disposal, development permits, or recreational access. Other financing mechanisms include transfers in the form of grants from corporate or philanthropic agencies, grants from conservation trusts or endowment funds, donations from crowdsourcing or community fundraising, as well as payments for environmental services (PES) or revolving loan funds. Self-generated revenues may include interest income, membership dues, and earnings from hydroelectric sales.

Financing received by watershed governance organizations supports a broad range of activities that are intended to improve overall outcomes for ecosystem health, water quality and water quantity. Of these activities, governance functions encompass the often intangible services such as community education and engagement, conflict resolution, consultation, and cross-jurisdictional coordination. Resource stewardship functions pertain to all non-structural activities such as data collection, mapping, monitoring, planning, and conservation or restoration projects. Infrastructure activities include the development and maintenance of all engineered assets related to flood protection, navigable waterways, stormwater collection, water delivery, and wastewater treatment. Finally, administration functions comprise all aspects associated with operating the watershed governance organization such as personnel, equipment, buildings, and related program costs.

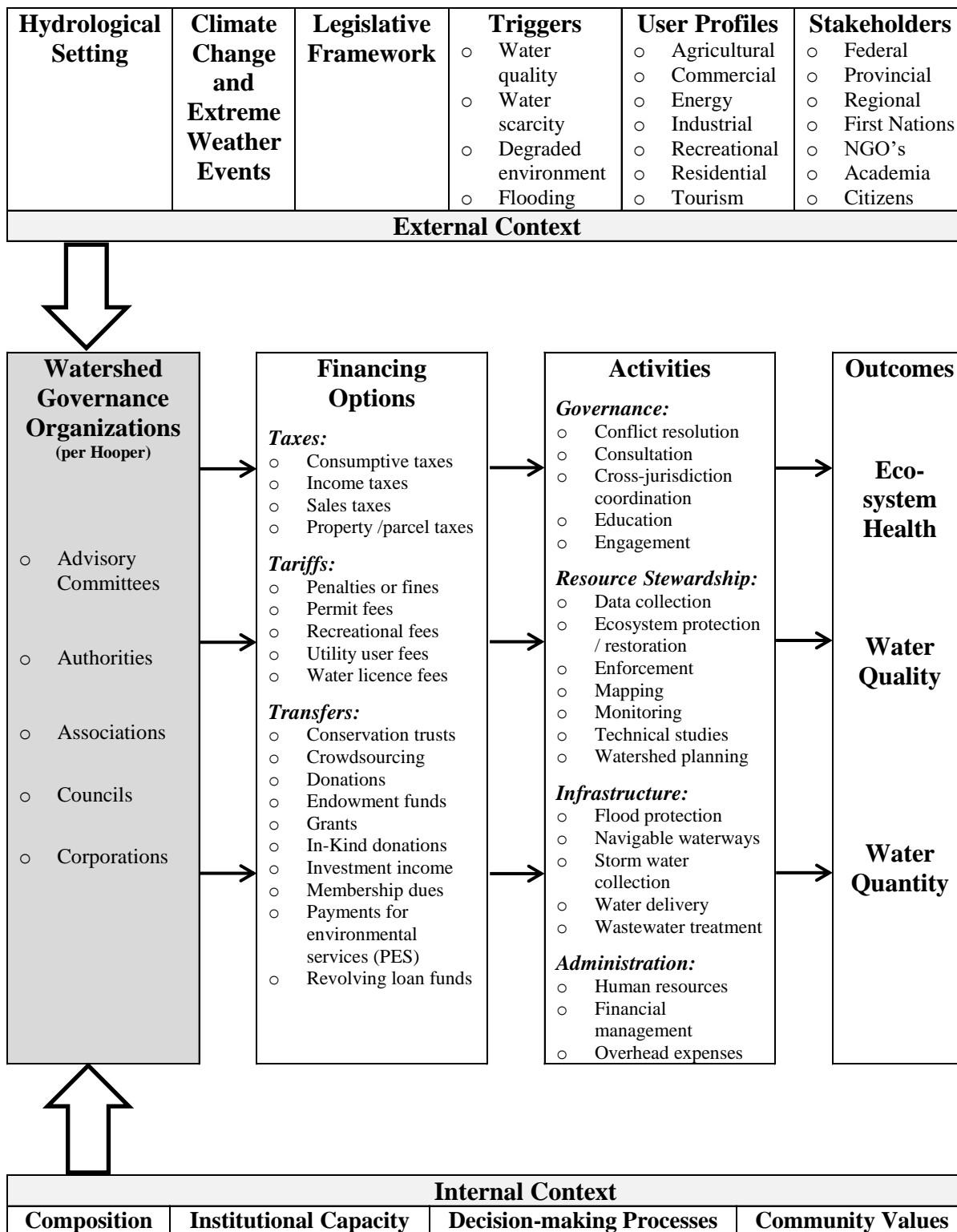


Figure 15 Summary of Findings

7.3 WATERSHED GOVERNANCE FINANCING - NO IDEAL SOLUTIONS

Effective watershed governance is complex and costly. It requires stable and sufficient revenues from taxes, tariffs, and transfers to finance the spectrum of governance, resource stewardship, infrastructure, and administration activities. The data from the literature review, jurisdictional scan and key informant interviews indicated that watershed governance organizations rely on a mix of these funding arrangements, and that there are no magic bullets, singular templates, or ideal solutions for financing water governance (Rees et al., 2008, pp. 12 & 37).

As illustrated in Figure 16, the jurisdictional scan revealed that the three case study water governance organizations with Advisory Committee, Association, or Council status [per Hooper's typology] were heavily reliant on transfers from senior governments and grants from corporate or philanthropic donors, and appeared to have limited financial autonomy. For example:

- The Clean Annapolis River Project (CARP) [Advisory / Association] has experienced challenges to the implementation of its mandate due to its indirect relationship with local governments as well as its reliance on grants from senior governments, corporate and philanthropic agencies (Timmer et al., 2007, p. 196).
- The Bow River Basin Council (BRBC) [Council] served as an example of Alberta's nested, provincially-integrated approach to watershed governance. Named as a Watershed Planning and Advisory Council (WPAC), the BRBC plays a pivotal role in providing leadership and technical assistance to the watershed stewardship groups in its region, and also has a voice at the province's Alberta Water Council. However, it is constrained by its reliance on grants and limited amounts of self-generated income.
- The Nisqually River Council (NRC) [Council] was featured because of its range of non-regulatory, advocacy, and education responsibilities, as well as its unique financing arrangement. The Council does not have its own funding. Instead, it is supported by the Nisqually River Foundation (NRF), which coordinates all transfers from federal, state, local and tribal governments, community grants, and fundraising activities. Since the expiry of a multi-year state funding contract in 2013, it has struggled to finance the NRC's operations. Notably, a recent ecosystem valuation report (Batker et al., 2009) estimated that the Nisqually Watershed generates goods and services in the range of \$287 million to \$4.2 billion USD per annum. Another report (Stanton et al., 2014) suggested six opportunities to capitalize on the basin's ecosystem worth by implementing new funding mechanisms (i.e. utility user fees, tourism user fees, property/ parcel taxes, and corporate donation programs) in order to generate the \$3 million USD per annum needed to fully fund the Nisqually Watershed Stewardship Plan. However, only three of the proposed options are easily implemented. The remaining three options will require substantive legislative amendments, new governance structures, as well as broad public and corporate support.

Further, Figure 16 highlights the contrast whereby the four case study water governance organizations with Corporation or Authority status [per Hooper's typology] received a significant proportion of their budgets from direct taxes or tariffs, and appeared to have greater operational stability and range of activities. For example:

- The Regional District of Nanaimo's (RDN) Drinking Water and Watershed Protection Program [Advisory / Corporation] is recognized as BC's first Regional District to successfully engage in a referendum process to obtain approval for a flat-rate parcel tax

to fund its Drinking Water and Watershed Protection (DW-WP) Service. In addition to revenues from this parcel tax, the RDN DW-WP Program obtains project-specific grants from senior governments, and has successfully engaged in partnerships with local stewardship groups to protect its seven major watersheds.

- The Okanagan Basin Water Board (OKWB) [Corporation] is acknowledged as one of BC’s two examples of formally legislated watershed governance organizations. Incorporated in 1970, the OKWB allows the Okanagan Valley’s three Regional Districts to collaborate on basin-wide water management issues. It receives 91% of its annual budget from municipal levies based on assessed property values, and the remaining 9% is received from transfers or interest income.
- Ontario’s Grand River Conservation Authority (GRCA) [Authority] exists within a provincial scheme that permits two or more local governments in a common watershed to pursue joint water governance programs and engage in direct taxation of constituents via municipal levies. Of the seven case study organizations, the GRCA has the most diverse revenue stream, with taxes and tariffs combined for 83% and transfers representing 17%.
- Finally, the Hoogheemraadschap van Rijnland (HvR) Regional Water Authority [Authority] exists within the Netherland’s national water governance scheme that has fully implemented the polluter pays and user pays principles. The HvR obtains its revenues exclusively from taxes (85%) and tariffs (15%), and has the broadest range of activities.

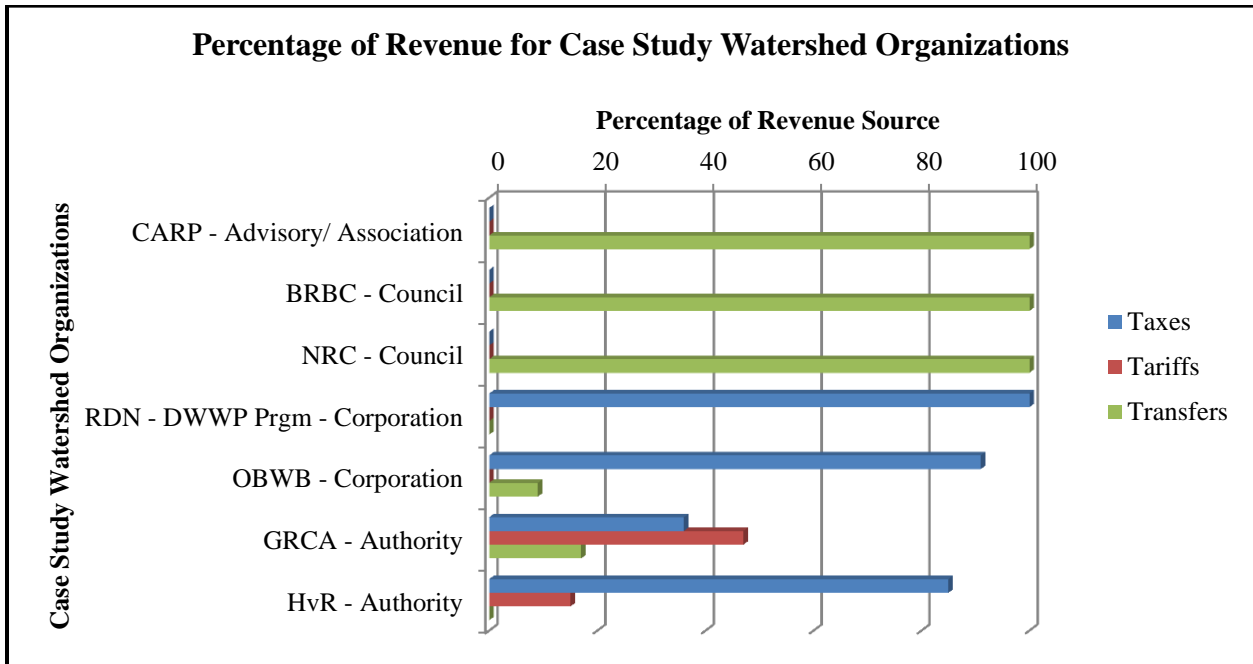


Figure 16 Percentage of Revenue for Case Study Watershed Organizations

The literature review indicated that, fundamental to the discussion regarding sustainable financing of watershed governance is the understanding that water is an economic good that should be priced in a manner that addresses negative externalities, as well as promotes its efficient and equitable use (UN, 1992, Section 2, para 5). The challenge, however, is that water-related goods, services, and resources can exhibit multiple economic characteristics (i.e. private goods, common-pool resources, natural monopoly goods, and public goods). Ideally, these economic characteristics should be used to inform the selection of water governance financing options such that taxation will be used for funding the often ‘intangible’ public goods and services (i.e. administrative overhead costs, cross-jurisdiction coordination, education, mapping or planning activities); and, tariffs or user fees will be paid by beneficiaries of private or natural monopoly goods (i.e. drinking water delivery or wastewater treatment). As noted in the key informant interviews, transfers are also best suited to ‘tangible items’ (i.e. infrastructure and either ecosystem protection or restoration projects). Another consideration is the ability to offset the costs of providing public good functions using more profitable tariff revenue streams rather than solely using taxes. Finally, the decision-making processes related to the pricing of water-related goods, services and resources should be influenced by the four principles: polluter pays, user pays, equity principle, and policy coherence. Figure 17 depicts the suggested alignment of financing options with watershed governance activities.

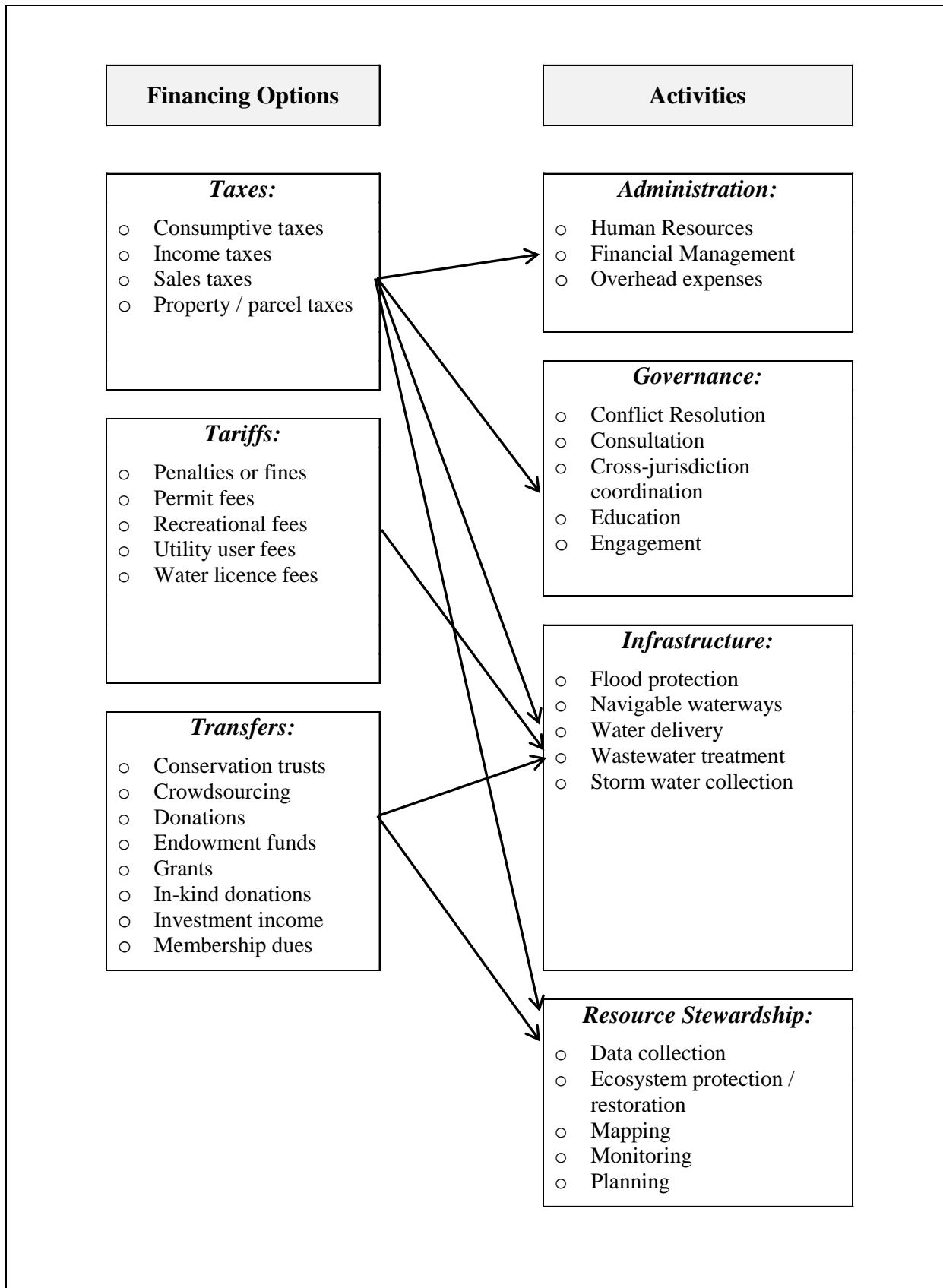


Figure 17 Suggested Alignment of Financing Options with Watershed Governance Activities

7.4 BRIDGING THE GAP - TAPPING INTO ALTERNATE REVENUE STREAMS IN BC

Sustainable financing of watershed governance requires the matching of all available revenue sources with all associated costs from the governance, resource stewardship, infrastructure, and administration activities. From the literature review and the key informant interviews, it was identified that the vast majority of watershed governance organizations in British Columbia are classified as semi-formal or informal, and they are experiencing a significant financing gap between the revenues that are currently available to them and what is needed to engage in effective water governance activities (Figure18). Bridging this financing gap will require the mobilization of all potential sources of funding and the incorporation of a diversified mix of financing mechanisms from the 3T revenue streams (OECD, 2009, pp. 24-30).

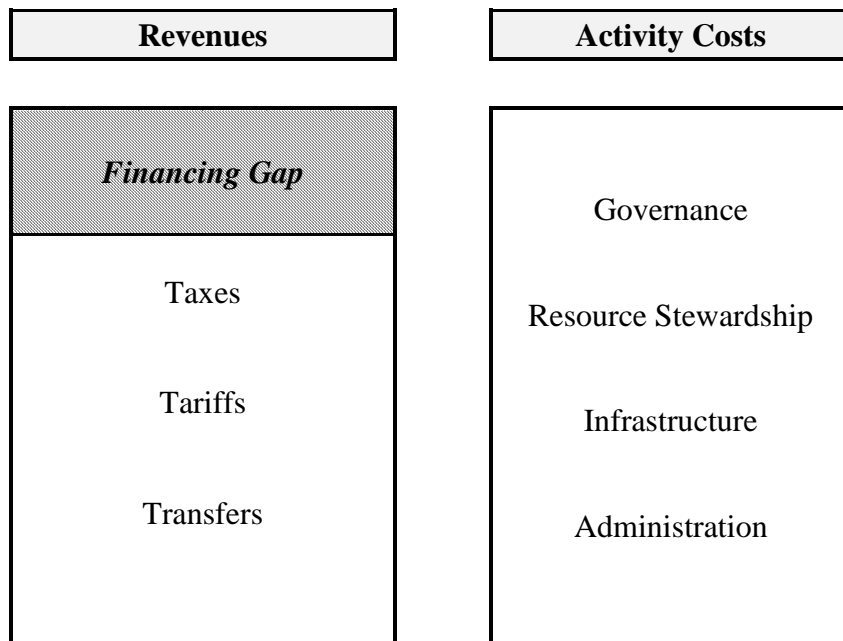


Figure 18 Bridging the Financing Gap
Adapted from OECD, 2012b, p. 60.

Achieving financially sustainable watershed organizations will require the development of coherent financing strategies (Rees et al., 2008, pp. 37-38). First, and commensurate with the appropriate level of delegation, the watershed governance organization will need to consider the economic characteristic of the water-related good, service or resource at hand (i.e. private, natural monopoly, common-pool, or public good) and the four principles (i.e. polluter pays, user pays, equity, and policy coherence). Second, it will need to address the financing objectives that are congruent with its community's values (i.e. adequate, efficient, equitable, feasible, flexible, no free riders). Third, it will need to tailor the selection of the revenue sources and corresponding financing mechanisms to match both the activity and the financing objective. In short, this will require concentrating public funds (i.e. taxes) on public or merit goods, and charging tariffs to

water users, beneficiaries, and polluters.¹⁹ Fourth, if a gap is identified between available resources and the ability to fund required activities, the watershed governance organization may consider the development of partnerships and combination of financial resources with other organizations or agencies (i.e. similar to the RDN DW-WP Program discussed in Section 5.3). Notably, no single revenue source or financing mechanism will achieve all stated needs and objectives: it will require a creative combination of financing mechanisms to achieve all requirements (FBC, 2015, p. 12).

The jurisdictional scan and key informant interviews suggested three specific opportunities for tapping into alternate revenue sources to bridge the financing gap. First, there is the ability to increase the use of existing financing options. The majority of interview participants suggested that the most likely future sources of revenues would consist of increasing the existing provincial water licence fees / rentals or existing local government property taxes, and then earmarking a percentage of this new money for watershed governance purposes. Similarly, there were suggestions to increase and then earmark a percentage of fees currently charged by local government's for water delivery and wastewater treatment. Accessing repayable sources of finance, through either private-sector loans or revolving local funds, may also be suitable, but the caveat is that this form of debt must eventually be serviced from taxes or tariffs collected by senior or local governments. Of note, there was a consensus among the interview participants that access to provincial water licence fees or rentals, or access to local government property/parcel taxes and user fees would represent the most stable form of revenue stream; and accordingly, these were deemed to be best suited for governance or administration activities (i.e. 'intangible' functions).

Secondly, there is the ability to implement financing options in a manner or in a jurisdiction where they are not currently in use. This option could include implementation of new earmarked parcel taxes or user fees. An example of this approach was illustrated in the Regional District of Nanaimo (RDN) case study, which saw a successful referendum process and establishment of a flat-rate parcel tax to fund its Drinking Water and Watershed Protection (DW-WP) Program.

Thirdly, there is the ability to use completely innovative options. In this category, the use of 'social financing' such as accessing grants from conservation trusts (i.e. Pacific Salmon Foundation or Habitat Conservation Trust Fund), corporate social responsibility programs (i.e. Royal Bank of Canada's Blue Water Project or the Real Estate Foundation of BC), endowment funds (i.e. the Gordon and Betty Moore Foundation), philanthropic agencies, donations from community fundraising and crowdsourcing efforts can be significant revenue sources. It is noted that social financing plays a major role in bridging the financing gap for 'tangible' functions since they can "provide an infusion of disruptive capital" (Morris, 2014, p. 14) to promote innovation, experimentation, or to complete short-term projects. However, the concern is that these forms of social financing can "fluctuate over time and are not able to replace the steady flow of public funding necessary for long-term activities such as watershed planning" (Baltutis et al., 2014, p. 57). Where possible, there is also the opportunity to expand self-generated income as in the GRCA example, which generates fully 47% of annual revenue from campsite fees, park entrance fees, floodplain development permit fees, and the sale of hydroelectric power. Finally, during the interview stage, one example emerged related to the Town of Gibson's 'Eco-Asset

¹⁹ By way of recap, Tables 4-6 illustrate the economic characteristics of water, potential financing mechanisms by revenue source, and financing objectives by suggested revenue source.

Strategy’, which advocates that financial management principles currently used for its engineered assets (i.e. roads, water, wastewater and stormwater systems) should also be applied to its natural assets or ‘eco-assets’ (i.e. aquifers, forests, and wetlands). The Town has indicated that these natural assets are an integral part of their overall infrastructure and that by quantifying their value, they would be better able to manage risks, save costs, and maintain healthy ecosystems (Town of Gibson, 2015, p. 5). Accordingly, the Town has included their eco-assets in their overall Asset Management Plan (p. 12), and their future intent is to report them in their municipal financial statements (p. 15).

7.5 SUSTAINABLE FINANCING - REQUIRES WATER GOVERNANCE REFORM

Achieving sustainable financing for watershed governance in British Columbia cannot be solely driven by a bottom-up approach from its semi-formal or informal watershed governance organizations, Regional Districts, municipal governments or First Nations communities. It will require a combination of their collective actions in addition to the provincial government’s active involvement in enabling new legislative and institutional frameworks. It will also require access to adequate, sufficient revenue streams by assigning appropriate financial responsibility to all water users (i.e. application of user pays and polluter pays principles), and then retaining these revenues for use within the watersheds (Dinar et al., 2005, p. 41). Figure 19 illustrates the reciprocal relationship between effective watershed governance requiring sustainable financing, and sustainable financing for watershed governance requiring water governance reform.

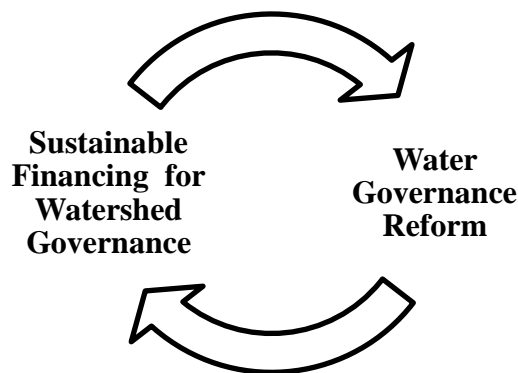


Figure 19 Relationship of Sustainable Financing and Water Governance Reform

From the literature review, jurisdictional scan, and key informant interviews it is apparent that in the absence of an integrated or nested approach to watershed governance in British Columbia, the existing semi-formal and informal watershed governance organizations will remain as a fragmented, patchwork collection of institutions. The interview participants clearly stated there is urgency for improving the mechanisms for Regional Districts, and local governments to form watershed governance organizations with local First Nations communities and stakeholders. As well, they emphasized the importance of having meaningful delegated decision-making abilities in their watersheds, and the ability to access adequate resources to fulfill the required range of activities.

Further to this, the interview participants were unanimous in their statements about the importance of adequately charging for water as a commodity. In their assessment, the current

pricing scheme creates the perception that water is undervalued, contributes to a diamond–water paradox,²⁰ and perpetuates the myth of abundance. Moving forward, a key strategy to promoting efficient and equitable use of water, addressing negative externalities, and generating adequate and sustainable financing for watershed governance in British Columbia will include the effective pricing of water at all levels.

7.6 SUMMARY

This section addressed the findings of the research project. It determined that there is no ‘one-size-fits-all’ approach to watershed governance models. There are many forms of watershed governance organizations and considerable variability in their contextual environments, levels of delegation, financing options, and range of activities. While there are ultimately three main revenue sources for financing watershed governance (i.e. taxes, tariffs, and transfers), there is a range of financing options from within each source to select from. In turn, these revenue sources are used to fund a range of activities including governance, resource stewardship, infrastructure, and administration functions.

It established that there are no ideal solutions for financing watershed governance (Rees et al., 2008, pp. 12 & 37). The literature review indicated that the pricing of water-related goods, services or resources should be influenced by the polluter pays, user pays, equity, and policy-coherence principles. It highlighted that the economic characteristics of water-related goods, services or resources should be matched to the appropriate revenue source (i.e. taxation for the provision of public goods, tariffs paid by beneficiaries of private or natural monopoly goods, and the utilization of private-sector pricing mechanisms to protect common-pool water resources). Moreover, the data from the jurisdictional scan indicated that some watershed governance organizations (i.e. Advisory Committees, Associations, or Councils - per Hooper’s typology) were heavily reliant on transfers from senior governments and grants from corporate or philanthropic donors, and had limited financial autonomy. It also revealed that other watershed governance organizations (i.e. Corporations or Authorities - per Hooper’s typology) received a significant proportion of their budgets from direct taxes or tariffs, and appeared to have both a greater operational stability and range of activities. Notably, it was determined that no single revenue source or financing mechanism would achieve all stated needs and objectives. Instead, it would need a combination of financing options to meet all requirements.

It underscored that the majority of watershed governance organizations in British Columbia are experiencing a financing gap between what is needed and the revenues that are currently available. Bridging this gap will require the development of coherent financing strategies that will tailor the mix of potential revenue sources to the activities at hand. More specifically, it identified three opportunities for tapping into alternate revenue streams. First, increasing existing water licence fees, rentals, or local government property taxes, and then earmarking the new monies for watershed governance purposes. Second, implementing financing options in a manner or jurisdiction where they are not currently in use such as the example of the earmarked flat-rate parcel tax to fund the Regional District of Nanaimo’s (RDN) DW-WP Program. Third, considering the application of innovative approaches such as the use of social financing, developing partnerships and combining financial resources with other organizations, creating

²⁰ From Adam Smith’s classic book, *The Wealth of Nations* (1776), the diamond-water paradox speaks to the apparent contradiction that while water is essential for life it is undervalued; and, that while diamonds are unessential for the preservation of life, they command a higher value (Parkin & Bade, 2013, p. 191).

opportunities to self-generate income; and, as with Town of Gibson, exploring the valuation and recording of eco-assets in a municipal Asset Management Plan.

Finally, it concluded that achieving sustainable financing for watershed governance would require the combined efforts of the Regional Districts, municipalities, First Nations communities, and existing watershed organizations, along with the provincial government's active involvement in facilitating new legislative and institutional frameworks. Key opportunities include the enabling of an integrated approach to collaborative watershed governance and the effective pricing of water as a commodity in British Columbia.

Recommendations to the client are made in Section 8.

8.0 RECOMMENDATIONS

These recommendations are informed by the research findings, and are congruent with OECD's Principles on Water Governance (2015, pp. 9-12).²¹ The first two recommendations are directed towards senior and local governments, and the final recommendation is oriented towards POLIS. They underscore that effective watershed governance and sustainable financing of watershed governance organizations are inescapably intertwined, and that neither will be fully realized without water governance and water-pricing reforms.

1. Enable development of an integrated, collaborative water governance framework.

A key finding of this report is that the absence of an integrated, watershed governance system in British Columbia is a barrier to effective watershed governance. The lack of a coordinated, province-wide water governance framework prevents meaningful delegated decision-making abilities, creates fragmentation, and creates variations in institutional capacities among existing watershed governance organizations. While there is no 'one-size-fits-all' approach to water governance, it is recognized that there is a need for an innovative framework that will enable the creation of collaborative watershed-scale decision-making bodies with appropriate levels of delegation, even where these organizations transcend existing political or institutional boundaries. This new framework may include creating opportunities for two or more local governments to merge their watershed governance interests, and it may contain standards for consistent inclusion of First Nations and community stakeholders.

2. Ensure mobilization of sufficient financial resources.

Another key finding of this report is that effective water governance is costly, and achieving sustainable financing of watershed governance will require the mobilization of sufficient financial resources at all levels of government to finance the spectrum of governance, resource stewardship, infrastructure, and administration activities. The solution to bridging the financing gap requires that the full costs of watershed governance be shared across all water users. It will necessitate the effective pricing of water as an economic good, and implementation of polluter pays and user pays principles. It will require regularly scheduled reviews to the provincial water licence fees and rental price rates. Finally, a portion of these new revenues may then be earmarked to support watershed governance organizations.

3. Promote capacity building.

POLIS should continue its work in building capacity in innovative water governance practices, as well as providing opportunities for dialogue and education on sustainable water governance practices. More specifically, as the provincial government moves forward with the next round of consultations towards full implementation of the *Water Sustainability Act*, that it continue to work in the identification and benchmarking of examples of watershed governance organizations who have implemented or are considering the implementation of innovative watershed governance or financing strategies. Further, a common theme among interview participants was that as BC's historic drought conditions continues to escalate, there is an urgent need to share experiences, identify good practices, and develop tools to move forward.

Section 9 concludes the report and suggests areas for future research.

²¹ See Figure 1 and Appendix E.

9.0 CONCLUSION

This report summarized the results of a research project to identify potential financing options that can be implemented to sustain watershed governance organizations in British Columbia. Using a qualitative research approach, it highlighted existing research on financing watershed governance organizations, examined characteristics of seven case study watershed governance organizations, and included subject-matter expertise from eight key informants.

The research indicated that effective watershed governance is costly. Achieving sustainable financing for watershed governance requires the mobilization of sufficient financial resources at all levels of government to finance the spectrum of governance, resource stewardship, infrastructure, and administration activities. It requires the development of coherent financing strategies that address the economic characteristics of water, fully implements the polluter pays and user pays principles, and incorporates revenue from all 3T sources (i.e. taxes, tariffs, and transfers). Mindful that the form of the watershed governance organization will influence the range of financing options that it can utilize to fulfill its activities, this will require tailoring the revenue sources to the activities and, then addressing identified shortfalls.

It indicated that there are three specific prospects for tapping into alternate revenue streams for sustainable financing of watershed governance in British Columbia. These opportunities included: (1) increasing the use of existing financing options (i.e. increasing provincial water licence fees / rentals, user fees or property taxes), (2) implementing financing options in a manner or jurisdiction where they are not currently in use (i.e. RDN's Drinking Water and Watershed Protection Program), or (3) embracing innovative options (i.e. expanding the use of social financing opportunities).

Effective watershed governance and sustainable financing of watershed governance organizations are inescapably intertwined; and, neither will be fully realized without water governance reforms. British Columbia's current freshwater crisis represents a narrow policy window, and can be the crucible for designing sustainable financing of watershed governance organizations. If the gap between the total costs of watershed governance activities and current financing options is the bad news, then the future consultation processes under the *Water Sustainability Act* for alternative water governance approaches and the ability to expand opportunities for tapping into alternate revenue streams for collaborative watershed governance is the good news.

The following are suggestions for future research related to sustainable financing of watershed governance in British Columbia:

- As noted in the Methodology Section 2.3, four categories from Hooper's typology of river basin organizations (i.e. commissions, tribunals, trusts, and federations) were excluded from this study on the basis of their unique circumstances or the presence of transboundary agreements. A potential area for future research would be to conduct an analysis of governance bodies from each of these four categories to discern how they function and finance their activities. It would then be possible to compare and extend the findings from this study.
- As noted in the Literature Review Section 3.3.3, a research gap exists in that much has been written on financing water delivery and wastewater infrastructure in recent decades, but little exists on financing IWRM or watershed governance functions (Rees et al., 2008, p. 4). Tied to this, there is an opportunity for continued research to discern the 'correct

pricing' of water-related goods, services and resources in British Columbia that will encourage citizens "to waste less, pollute less, invest more in water infrastructure, and value watershed services" (OECD, 2012a, p. 60).

- Finally, as noted in the Key Informant Interviews Section 6.5, there is curiosity about the Town of Gibson's innovative approach to reporting natural assets alongside engineered infrastructure in their Asset Management Plan, with the intent of eventually incorporating them in their municipal financial statements. However, the valuation and recording of eco-assets are not currently permitted under Canadian Public Sector Accounting Board (PSAB) Standards. As such, there is an opportunity to research and develop PSAB Standards that would allow the future inclusion of natural assets in municipal financial reports (Town of Gibson, 2015, p. 15).

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APPENDIX A PARTICIPANT RECRUITMENT EMAIL

FROM: xxxxxxxx @uvic.ca
TO: xxxxxxxx@ xxxxxx
DATE: system date
SUBJECT: Invitation to Participate in Research Project – “Towards Sustainable Financing of Watershed Governance in BC”
ATTACHMENTS: 1. Participant Consent Form 2. Interview Questions

Dear (name of potential participant),

I would like to invite you to participate in a research project that will explore the applicability of various sustainable financing options for watershed governance in British Columbia.

This study is being conducted on behalf of the project client, Oliver Brandes, Co-Director and Project Lead of the POLIS Water Sustainability Project, and is in partial fulfillment of the requirements for the degree of Master of Public Administration, University of Victoria. My affiliation with the University of Victoria may be verified by contacting the School of Public Administration office at xxx.xxx.xxxx or through my academic supervisor Dr. Lynda Gagné at xxxxx@uvic.ca or xxx.xxx.xxxx.

As part of my research, I will be conducting individual interviews with up to twelve volunteers. Each interview will consist of a number of open-ended questions and is expected to last between 45 to 60 minutes in length. The interview will be digitally recorded, transcribed and you will have the opportunity to verify your transcript. All interview data will be anonymized and summarized in the final project report.

You have been identified as a potential participant based on your expertise in either watershed governance financing schemes, asset management or infrastructure financing. During the interview, you will be asked to share your experience and perspectives on these topics as they relate to sustainable financing options for watershed governance in BC.

I have attached two documents for your review: the Participant Consent Form, and the Interview Questions.

Your participation would be greatly appreciated, and your opinions matter. If you have any questions or are willing to participate, please let me know.

Thank you,

Louise Oliphant, BA, CACE

Cell: xxx.xxx.xxxx

APPENDIX B PARTICIPANT CONSENT FORM



**University
of Victoria**

Participant Consent Form

Project Title: *Towards Sustainable Financing for Watershed Governance in British Columbia: Tapping into Alternate Revenue Streams*

Client: Oliver Brandes
Co-Director and POLIS Water Sustainability Project Lead
Centre for Global Studies, University of Victoria

Researcher: Louise Oliphant, Graduate Student
School of Public Administration, University of Victoria
Phone: xxx.xxx.xxxx Email: xxxxxxxx@uvic.ca

Supervisor: Dr. Lynda Gagné, Assistant Professor
School of Public Administration, University of Victoria
Phone: xxx.xxx.xxxx Email: xxxxxx@uvic.ca

Purpose and Objectives of the Research:

- This research is being conducted in partial fulfillment of the requirements for the degree of Master of Public Administration, University of Victoria.
- The purpose of the project is to support the client's research in identifying sustainable watershed governance finance options suitable for implementation in British Columbia.
- The study will: identify examples of watershed governance structures from similar jurisdictions as British Columbia, in Canada and internationally; discern characteristics of these governance bodies, how they work and how they are financed; analyze emergent learning in the field of watershed governance financing; and assess how these insights may be applied to British Columbia's context.

This Research is Important because:

- This research is important because it will add to the rapidly evolving body of knowledge in this field; and, it will contribute to the dialogue between stakeholders, policy-makers and government officials who have an interest in developing financially sustainable watershed governance models.
- It is also timely as British Columbia is modernizing its provincial water management legislation with the introduction of the *Water Sustainability Act* (WSA) in 2016.

Participation:

- You are being asked to participate in this study because of your experience or expertise in either sustainable watershed financing schemes, asset management or infrastructure financing. It is hoped that you will share your perspectives on sustainable financing options for watershed governance in BC.
- Participation in this project is entirely voluntary.

Procedures:

- Your participation will include an individual telephone interview conducted at a mutually convenient time. The interview will consist of a number of open-ended questions, and is expected to last between 45 to 60 minutes.
- Telephone interviews will be digitally recorded, transcribed, and you will have the opportunity to verify your transcript.
- **Inconvenience:** Individual telephone interviews are estimated to take between 45 to 60 minutes, and time spent verifying one's transcript may take up to 30 minutes. Total anticipated time is no more than 1.5 hours.

Compensation:

- There are no incentives, compensation or reimbursements paid for participation in this study.

Benefits:

- **To the participant:** Participants will have an opportunity to share their experience and expertise in sustainable watershed financing schemes, asset management or infrastructure financing. In doing so, they will have the benefit of contributing to the dialogue between stakeholders, policy-makers and government officials who have an interest in developing financially sustainable watershed governance models for British Columbia.
- **To society:** There is potential to support the development of effective watershed governance bodies in British Columbia through the identification of alternate financing options. In doing so, this will enhance the overall sustainability, longevity, and capacity of watershed governance bodies to respond to emerging issues.
- **To the state of knowledge:** There is potential to expand the state of knowledge about innovative watershed governance practices, generally; and, about sustainable financing options for watershed governance bodies, specifically.

Risks:

- There are no known or anticipated risks to you by participating in this research.

Researcher's Relationship with Participants:

- There are no known relationships between the researcher and any potential participants.

Withdrawal of Participation:

- You may decline to answer any of the interview questions.
- You may withdraw at any time without explanation or consequence.
- Should you withdraw, you may provide written direction to the researcher on the disposition of your interview data (i.e. inclusion or destruction).

Continued or Ongoing Consent:

- In addition to the telephone interview, you will be provided an opportunity to verify your transcript.

Anonymity and Confidentiality:

- All interview responses will be confidential. No names will appear in any reports, documents or presentations related to this research. While quotes may be used in the final report, no comments will be attributed to any individual participant.
- Although your interview responses will be anonymized in the final report, as 1) you were identified as a potential participant based on your subject-matter expertise during the document review phase of this research project, and in consultation with the client and academic supervisor, and 2) due to the small population size of the key informant interviews, there is a potential for individuals to deduce a participant’s identity once the study findings are published.
- All data including handwritten interview notes, transcripts, audio files and all related research documents will be kept strictly confidential and in a locked filing cabinet located at the researcher’s personal residence.

Research Results will be Disseminated in the Following Ways:

- A summary of the study will be made available to the participants after the publication of the research.
- The research findings may be disseminated in the following manner: oral defence presentation, posted on the UVIC Theses internet repository, and published as an article.

Disposal of Data

- Data from this study will be retained for one year from the publication date of the research project findings. After which, all electronic data will be erased, and all paper records will be shredded (i.e. August 31, 2016).

Questions or Concerns:

- Contact the researcher or academic supervisor using the information at top of page 1; or
- Contact the Human Research Ethics Office, University of Victoria, xxx.xxx.xxxx or xxxxxx@uvic.ca

Consent:

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researcher, and that you consent to participate in this research project.

Name of Participant

Signature

Date

A copy of this consent will be left with you, and a copy will be taken by the researcher.

APPENDIX C SEMI-STRUCTURED INTERVIEW GUIDE



**University
of Victoria**

Semi-Structured Interview Guide

Project Title: *Towards Sustainable Financing for Watershed Governance in British Columbia: Tapping into Alternate Revenue Streams*

Welcome:

- *Hello and thank you for agreeing to meet with me today.*
- *My name is Louise Oliphant. As part of my coursework towards a Master of Public Administration degree from the University of Victoria, I am conducting a research project on behalf of a client - Oliver Brandes from the POLIS Water Sustainability Project - and I am working under the academic supervision of Dr. Lynda Gagné at the School of Public Administration.*

Before We Start - Review of Participation Consent Form:

- *Have you had the opportunity to review the Participant Consent Form?* Yes No
 - *Review Participant Consent Form and answer any questions.*
- *Have you received sufficient information to participate in this study?* Yes No
- *Do you agree to the digital recording of this interview?* Yes No
- *Do you agree to participate in this interview?* Yes No
 - ***If No:*** *end here by saying “thank you for your time.”*
 - ***If Yes:*** *continue with the script.*

Orientation to Interview:

- *The purpose of this research project is to explore sustainable financing options for watershed governance bodies in British Columbia.*
- *You have been invited to participate in this study because of your expertise in either sustainable watershed financing schemes, asset management, or infrastructure financing.*
- *Our conversation today is an opportunity for you to share your experience and perspectives on these topics.*
- *Today’s interview is expected to last between 45 to 60 minutes and consists of seven open-ended questions.*

QUESTIONS:

Part 1 – Introduction:

The first set of questions is intended to allow you to introduce yourself and to provide some background context to your responses ~ 5 minutes.

1. Please tell me a little about yourself.
 - a. When and how did you begin your involvement with watershed governance issues?

- b. Describe your current role / the role of your current organization as it relates to watershed governance?

Part 2 – Sustainable Financing Options for Watershed Governance Bodies:

This next section of questions is intended to illuminate your perspective of how key concepts are defined ~ 15 minutes.

2. What does the term ‘watershed governance’ mean to you?
3. What does the phrase ‘sustainable financing of watershed governance’ mean to you?
4. There are a variety of funding options available to sustain watershed governance. Please describe the financing methods that you are familiar with?
 - a. Where have you seen these financing methods implemented?
 - b. What were the results?
 - c. In what way were they successes /challenges?

Part 3 – Implementation in British Columbia:

This next set of questions seeks your opinion on how some (or all) of these financing options can be utilized in British Columbia ~ 20 minutes.

5. In your opinion, of the various watershed governance financing options available, which do you believe would be the most appropriate for implementation in British Columbia?
 - a. Please elaborate on what you believe needs to be changed to accomplish this?
 - b. What would the key barriers be to accomplishing this?
6. In your opinion, what does British Columbia need to be doing in order to be considered a world leader in sustainable financing for watershed governance bodies?

Part 4 – Final Thoughts:

This final set of questions is intended to allow you to speak to any topic that we have not specifically covered ~ 5 minutes.

7. We are nearing the end of our time together:
 - a. Is there anything else that you would like to add?
 - b. Are there any questions that you have of me?

Closing:

- *I appreciate your willingness to share your experience and perspectives with me. I have learned a lot, and your contributions will help me with my research project.*
- *In the next days, I will be forwarding an interview transcript to your email account [verify address] and ask that you provide feedback on its content and accuracy.*
- *Thank you again for your time today.*

APPENDIX D INTERVIEWEE CODES

Participant's ID	Sector
WG1	Government
WG2	Government
WG3	Non-government organization / other
WG4	Watershed organization
WG5	Watershed organization
WG6	Watershed organization
WG7	Government
WG8	Non-government organization / other

APPENDIX E OECD PRINCIPLES ON WATER GOVERNANCE

Enhancing the effectiveness of water governance:

1. Clearly allocate and distinguish *roles and responsibilities* for water policy making, policy implementation, operational management and regulation, and foster coordination across these responsible authorities.
2. Manage water at the *appropriate scale(s)* within integrated basin governance systems to reflect local conditions, and foster coordination between the different scales.
3. Encourage policy coherence through effective *cross-sectoral coordination*, especially between policies for water and the environment, health, energy, agriculture, industry, spatial planning, and land use.
4. Adapt the level of *capacity* of responsible authorities to the complexity of water challenges to be met and to the set of competencies required to carry out their duties.

Enhancing the efficiency of water governance:

5. Produce, update, and share timely, consistent, comparable and policy-relevant water and water-related *data and information*, and use it to guide, assess and improve water policy.
6. Ensure that governance arrangements help mobilize water finance and allocate *financial resources* in an efficient, transparent and timely manner.
7. Ensure that sound water management *regulatory frameworks* are effectively implemented and enforced in pursuit of the public interest.
8. Promote the adoption and implementation of *innovative water governance practices* across responsible authorities, levels of government, and relevant stakeholders.

Enhancing trust and engagement in water governance:

9. Mainstream *integrity and transparency* practices across water policies, water institutions and water governance frameworks for greater accountability and trust in decision-making.
10. *Promote stakeholder engagement* for informed and outcome-oriented contributions to water policy design and implementation.
11. Encourage water governance frameworks that help manage *trade-offs* across water users, rural and urban areas, and generations.
12. Promote regular *monitoring and evaluation* of water policy and governance where appropriate, share the results with the public and make adjustments when needed.

Source: OECD, 2015, pp. 9-12.

APPENDIX F OVERVIEW OF WATER LEGISLATION IN BC

Jurisdiction	Statute	Scope
Federal	<i>Canada Water Act</i>	Provides for management of water resources, including research, planning and implementation of programs related to conservation, development, and utilization. If an agreement cannot be reached with the province, the Act provides for unilateral action by the federal government. The provisions for unilateral action are limited to federal waters and inter-jurisdictional waters of “significant national interest” or where water quality has become a matter of “urgent national concern”.
	<i>Canada National Parks Act</i>	Provides for the creation and management of national parks on federal land.
	<i>Canadian Environmental Assessment Act</i>	Provides for the environmental assessment of projects where the proposed project is on federal land (i.e. Indian Reserve), is under federal sponsorship and a federal act applies (i.e. the <i>Navigation Protection Act</i>).
	<i>Canadian Environmental Protection Act</i>	Provides for protection of the environment and human health by managing toxic substances, marine pollution, disposal at sea, and other sources of pollution. Also addresses international water pollution and permits the federal government to take action if the province is not addressing the issue. In the case of environmental emergencies, provisions in the Act govern if no other federal or provincial regulations exist.
	<i>Fisheries Act</i>	Provides authority over fish and fish habitat. Water quality is protected through provisions for prevention of pollution of waters inhabited by fish.
	<i>International Boundary Waters Treaty Act</i>	Provides for the protection of international waterways between Canada and United States by requiring a licence to obstruct or divert boundary waters.
	<i>Navigation Protection Act</i>	Provides for the protection of the public right to marine navigation and protects the safety of mariners and the marine environment (includes freshwater).
Provincial	<i>Water Sustainability Act</i>	Authorizes licences for stream water and groundwater use. Establishes water objectives to ensure water quality and water quantity; and to sustain aquatic ecosystems. Protects critical environmental flow thresholds for streams in water licensing decisions. Establishes Water Sustainability Plans. Authorizes general and high penalty offences.
	<i>Water Act</i> (now <i>Water Users’ Communities Act</i>)	Mostly repealed and replaced by the <i>Water Sustainability Act</i> (WSA) with the exception of provisions related to water users’ communities. Renamed the <i>Water Users’ Communities Act</i> .

Jurisdiction	Statute	Scope
Provincial	<i>Water Protection Act</i>	Prohibits bulk water exports and large-scale water transfers between watersheds.
	<i>Water Utility Act</i>	Provides for regulating privately operated water systems servicing five or more persons or a corporation. Operators are subject to the same duties, responsibilities and restraints that are imposed on a public utility under the <i>Utilities Commission Act</i> .
	<i>Dike Maintenance Act</i>	Establishes the inspector of dikes to supervise construction and maintenance of dikes, and operation of dike authorities.
	<i>Drainage, Ditch and Dikes Act</i>	Establishes a scheme for the regulation and authorization of ditches, watercourses, dikes and drainages throughout BC.
	<i>Drinking Water Protection Act</i>	Administered by Health Authorities, the Act requires that water supply systems must provide potable water and must have construction and operating permits. It also establishes qualification standards for operators, requirements for emergency response, water monitoring, water source and system assessments; and, a process for preparing a drinking water protection plan.
	<i>Environmental Assessment Act</i>	Establishes an environmental assessment process and requires an environmental assessment certificate before a major project can be constructed. Hydroelectric power projects with the capacity to produce 50 megawatts or more are subject to review under this legislation as are certain major projects relating to dams, dikes, water diversion, groundwater extraction and shoreline modification.
	<i>Environmental Management Act</i>	Regulates industrial and municipal discharge, pollution, hazardous waste, and contaminated site remediation. Requires environmental plans for flood control, drainage, soil conservation, water resource management, waste management, and air quality management.
	<i>Fish Protection Act</i> (now <i>Riparian Areas Protection Act</i>)	Provisions of this statute related to the protection of fish populations and fish habitat by prohibiting bank-to-bank dams on 17 protected rivers; and, the authorization of ‘sensitive streams’ for fish sustainability, provincial directives for streamside protection, and reduction in water use during periods of drought (temporary) or by Water Sustainability Plans, have now been moved to the WSA. Now renamed the <i>Riparian Areas Protection Act</i> .
	<i>Forest and Range Practices Act</i>	Governs forest activities on Crown land. Authorizes regulations that set objectives for water that must be addressed through results and strategies identified and undertaken by forest and range agreement holders. Also provides for designation and protection of Community Watersheds, and watersheds with significant downstream fisheries and watershed sensitivity.

Jurisdiction	Statute	Scope
Provincial	<i>Oil and Gas Commission Act (Oil and Gas Activities Act)</i>	Provides for administration of oil and gas development in the province by the Oil and Gas Commission (OGC). The OGC has the authority to issue water approvals under the WSA associated with oil and gas activity.
	<i>Park Act</i>	Provides for the establishment and management of provincial parks and recreation areas dedicated to preserving the natural environment.
Local	<i>Community Charter</i>	Provides a framework for municipalities to identify and meet community needs. Related to water management, it provides the authority to establish bylaws in “spheres of concurrent authority” such as protection of the natural environment and protection of public health.
	<i>Local Government Act</i>	Provides corporate authority to local governments (i.e. municipalities, regional districts, and improvement districts). Related to water management, it provides powers and responsibilities related to land-use, growth, and infrastructure (i.e. stormwater management).

Sources: Adapted from BCMOE, 2013, pp. 101 - 103; Government of BC, Consolidated Statutes and Regulations (n.d.); Government of Canada, Consolidated Acts, n.d.