USING CONSUMER BELIEFS AND VALUES IN THE DESIGN OF SUSTAINABLE WATER GOVERNANCE SYSTEMS

By

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Abstract

Uncertainty clouds the future of the our drinking water resources in the midst of climate change, mismanagement, degrading quality, and increasing demand. This has increased the necessity for consumer trust in water governance systems and consumer buy-in and voluntary action in support of sustainable water management policies. From theoretical and empirical perspectives, this study explores the role of beliefs and values in designing and operating water governance systems capable of successfully delivering sustainable water supplies (e.g. conservation, equity, accessibility, affordability, meeting consumer needs, and clean drinking-water). It concludes by presenting a water governance system design tool. This provides guidance for the use of trust-building dialogues to identify water governance operating principles which respect human rights and reflect consumer beliefs and values and incorporate these in the design of successful water governance systems in developed and developing regions. Future uses include application as a companion to World Bank's water initiatives.

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Table of Contents			
Abstract	II		
Acknowledgements	III		
SETTING THE STAGE	1		
FIGHTING FOR THE RIGHT TO WATER AND THE RIGHT TO CHOICE	2		
UN THE PATH TO	4		
BEYOND CARROTS AND STICKS	5		
ROADMAP	6		
PRIMARY RESEARCH QUESTION	6		
SECONDARY RESEARCH QUESTIONS	6		
PART 1: THEORETICAL EXPLORATION	7		
PART 2: PRACTICAL EXPLORATION	8		
PART 3: APPLICATION	9		
PART 1: THEORETICAL EXPLORATION	10		
BRIDGING THEORIES	10		
OUTCOMES	10		
THE HUMAN RIGHT TO WATERA BELIEF	11		
THE RIGHT TO SELE DETERMINATION THE FORGOTTEN BELIEF	 13		
HEADWATERS			
GOVERNANCE AND GOVERNANCE SYSTEMS	20		
WATER-RESOURCE GOVERNANCE	20		
GENERAL SYNOPSIS I	28		
MECHANISMS	30		
HUMAN RIGHTS THROUGH GOOD GOVERNANCE	30		
Sustainability and Good Governance	34		
GENERAL SYNOPSIS II	36		
BARRIERS & DRIVERS	37		
BARRIERS TO PARTICIPATION	37		
TRUSTDRIVING PARTICIPATION	38		
Point of Origin: Beliefs and Values	40		
THE INTERACTION OF BELIEFS AND VALUES IN WATER GOVERNANCE	41		
PART 2: PRACTICAL EXPLORATION	47		
	<i>۲</i> ۸		
PUTTING THEORY INTO PRACTICE	4/		
BRIDGING IVIE THODS	49		
STUDY LOCATIONS	50		

Арргоасн	55
EXPLORATORY SURVEY	55
Data Analysis Methods	64
Online Survey Tofino and Ucluelet	65
RAPID RURAL APPRAISAL PUERTO MAGDALENA AND PUERTO SAN CARLOS	65
Participant Bias	66
Case Study Findings	66
EXPLORING BELIEFS AND VALUES AS AN INDICATOR OF TRUST	67
EXPLORING THE DIFFERENCES BETWEEN COMMUNITIES	76
PART 3: APPLICATION	89
Recap	89
A CONSUMER BELIEFS AND VALUES-BASED WATER GOVERNANCE SYSTEM DESIGN TOOL	90
GOAL	91
USING THE TOOL	92
Uses and benefits for Stakeholders	95
Future Work	100
ONE FINAL OBSERVATION – A NEW HORIZON FOR BOTTLED-WATER COMPANIES	102
References	104

List of Appendices

- Appendix A Online survey for Tofino and Ucluelet
- Appendix B Ethics Review
- Appendix C Data analysis methods for online survey responses
- Appendix D Complete listing of all relationships found between beliefs and values categories (Part A, D, & E) and WGS operating principles (Part B).

Appendix E - Definitions

List of Tables

Table 1. Operating principles associated with the three generic water governance systems. 22
Table 2. The variables being explored by each of the study questions. 50
Table 3. Comparison of various attributes of the study communities
Table 4. The number of invitations sent and resulting number of individuals (participants) who participated in the online survey administered in Tofino and Ucluelet
Table 5. Results of the online survey summarizing which operating principlesparticipants associated with each type of water governance system. The data ispresented as the number of participants that chose an operating principle and thecorresponding water governance system they selected.70
Table 6. Relationship between the categories of beliefs and values selected by participants and the operating principles they selected for their 'Ideal' WGS. 73
Table 7. Comparison of participant trust in each water governance system
Table 8. This table identifies the study communities used to address each studyquestion.78

List of Figures

Figure 1. Theoretical framework for a consumer beliefs and values-based approach to drinking water governance design
Figure 2. Water governance systems situated along a line indicating the degree of difference between their respective operating principles
Figure 3. A theoretical framework showing the process and outcomes of a consumer beliefs and values-based approach to the design of drinking water governance systems. The model takes a funnel shape in order to reflect the bottom-up and top-down nature of a belief and values based approach to water governance
Figure 4. Topics addressed in the survey as questions with regards to participant 57
Figure 5. Topics addressed in the survey as questions with regards to
Figure 6. Topics addressed in the survey as questions with regards to participant 59
Figure 7. Framework showing the process and outcomes of a consumer beliefs and values-based approach to the design of drinking water governance systems
Figure 8. The location where a belief and value-based tool would be used to facilitate dialogue between stakeholders and guide the design of water governance systems within a beliefs and values-based approach to water governance
Figure 9. The example of an Ideal WGS as situated along the WGS line using a ranking system and the results of the beliefs and value-based survey. Since the Ideal WGS ranked less than partway between a community and public system, maximum levels of consumer trust would be found in WGS that more closely resembled a hybrid community-public or public system. 95

"When the well is dry, we know the worth of water."

Benjamin Franklin (1706 – 1790), from Poor Richard's Almanac, 1746

"The water crisis is essentially about how we as a society and as individuals perceive and govern water resources and services"

United Nations World Water Assessment Programme, 2003

"You may be deceived if you trust too much, but you will live in torment if you don't trust enough."

Frank Crane (1861 – 1928) – Columnist

SETTING THE STAGE

Uncertainty clouds the future of our drinking water resources in the midst of climate change, mismanagement, degrading quality, and increasing demand. In response, the eyes of governments, corporations, civil society, and consumers have fixed their gaze on the future of drinking water governance; who should control water where, when, and how. Decisions regarding water, many of which are precedent setting, are being made daily around the world with stakeholders pushing their own agenda. Consumers, seldom included or considered in these decision-making processes; are left to contend with the fallout of the often misguided choices of other stakeholders and expected to adhere to decisions they do not trust. The outcome has been an increase in water governance conflicts; clashes between stakeholders due to their different fundamental beliefs and values with respect to such issues as access, ownership, human rights, and decision-making.

At the heart of every decision are the distinct beliefs¹ and values² of the individual, communities, corporations, and governments that make those decisions. These beliefs and values are derived from the more general beliefs and values held by the decision-maker concerning societal conditions such as societal interactions (e.g. how decisions are made, resource distribution, etc.), government, economy, religion, neighbours, and environment. Studies show that our capacity to trust other individuals and groups arises from having shared beliefs and values about these societal conditions (Earle & Cvetkovich, 2000)

¹ Oxford English dictionary defines beliefs as "...firmly held opinion(s)."(Author, 2007) This is the definition used herein.

 $^{^{2}}$ Oxford English dictionary defines values as "...the regard that something is held to deserve; importance or worth." (Author, 2007). This is the definition used herein.

Water governance is the sum of a series of decisions made by decision makers, typically representing the government and private industry. Water service providers are guided by these decisions which together become the operating principles associated with the drinking water governance system. These principles (e.g. how decisions are made and by whom: refer to Appendix A) are the institutional beliefs and values that determine how a governance system solves problems towards the efficient and equitable allocation of drinking-water.

As members of governed societies we have chosen to conform to the decisions of others, decisions that may not necessarily mirror our beliefs and values. However, unlike many decisions that govern our day to day lives, those concerning drinking water are decisions about the very source of life. Suppressing the public's right to selfdetermination in matters relating to water governance can threaten their right to water, setting a water governance system up for failure. As consumers turn against the system, conservation policies go unheeded, service bills go unpaid, and consumer trust in the system dissolves. In severe cases, large scale consumer protests have resulted further damaging the already fragile relationships between stakeholders. Governments, corporations, and civil society groups are quickly discovering that the general public/consumers have their own unique views concerning water governance and are demanding to be heard.

Fighting for the Right to Water and the Right to Choice

Consider this: In the late 1990's, the World Bank along with the Bolivian national government conducted closed-door negotiations that would result in a variety of changes to the drinking water governance system of the city of Cochabamba. The

decisions made by these parties, together with the newly appointed service provider Bechtel, restructured the Cochabamba water system to a form of private water management from a publicly managed one. These decisions were highly contentious, having been made without the involvement of the general public or the consideration of their beliefs and values. Bechtel was given full ownership of Cochabamba's drinking water resources, and proceeded to raise the price of water by 200%, entirely without consumer input (Schultz, 2003). Consumer trust in the private management style of WGS fell, and opposition increased as water governance decisions (pertaining in particular to affordable access) that were contrary to consumer beliefs continued to be made (Nickson & Vargas, 2002). Consumers organized large protests to initiate a change in the WGS and remove the corporation acting as service provider from its role. Within a year of the WGS reform, the service provider fled the country and public management of WGS resumed (Pitman & Ringskog, 2002).

There are many other examples of water governance conflicts in both developed and developing countries. These are generally not as extreme as what occurred in Bolivia, typically taking the form of public protests against decision-makers and stakeholders or as work-around(s). For example, in Tofino, Canada, a drinking-water ban imposed due to a severe water shortage had limited results as several businesses continued to use water, sceptical of the gravity of the situation, and not satisfied by the efforts of the municipal water service to pre-empt the shortage and seek alternative water sources (e.g. water trucks) (Canadian Broadcasting Corporation, 2006; Westad, 2006). This further aggravated the situation, increasing the strain on the water resources and discord among stakeholders in the community. Despite their scale, water governance conflicts share two central themes, the human right to water and the right to self-determination. The first of these rights guarantees life and livelihood, while the second guarantees a voice and a choice. Ignoring consumer input or preventing them from participating in water governance limits the effectiveness of a governance system as these systems will not represent the beliefs and values of the local consumer. These conflicts often begin with the marginalization of the largest stakeholder group (consumer) and their right to self-determination being denied. This limits the ability of a water governance system to grow organically from the beliefs and values of the local consumer resulting in an ineffective WGS unable to meet the expectations and demands of consumers.

The most severe of water governance conflicts, such as the one described in Cochabamba, begin with the denial of the consumers' right to self-determination, which can give way to a difference of beliefs between stakeholders about how and whether the right to water is protected by the water governance system. As no individual would deliberately deny themselves access to water, a governance system that protects the right to self-determination by encouraging and acting on consumer feedback would encourage guarantee the long term protection of the right to water creating public support and respect for conservation measures as wells as a productive decisionmaking environment.

On the Path to...

Sustainability: This word conveys the complex social, environmental, and economic conditions and interactions involved in providing drinking water. These include the primacy of water to human life and livelihoods (matters of human rights), interactions between water suppliers and consumers (matters of governance) and how our individual beliefs can influence the success of the policies required to ensure sustainability (matters of present and future well-being). Understanding these many facets of sustainable drinking water management can pave the way to good governance of drinking-water resources, by allowing decision-makers to tailor policies that best interact with local consumer beliefs and local socioeconomic and environmental conditions.

Beyond Carrots and Sticks

The effective and efficient delivery of life-dependant resources such as drinking water goes beyond enforceable restrictions and regulations. Drinking water policy and programs need to reflect consumer rights, beliefs and values. This requires trust-building dialogue to define water governance operating principles that reflect these rights, beliefs and values and soft systems approaches to defining and delivering consumer supported sustainable drinking-water policies and programs.

This study explores the role of shared beliefs and values in designing water governance systems with the goal of building consumer trust and support for successful sustainable water management policies (e.g. conservation, equity, accessibility, affordability, meeting consumer needs, and clean drinking-water). It concludes with a beliefs and values-based approach to water governance systems and a tool to assist in the design of such systems as part of improving the success of water governance in both developed and developing worlds.

ROADMAP

This section provides a road map for this exploration. The study consists of three parts: Theoretical Exploration; Practical Exploration; and Application. Three research questions are used to structure this exploration and test the applicability of a beliefs and values approach to water governance.

Primary Research Question

Although considerable research has been conducted in the realm of shared beliefs, values and trust with regards to public policy in internet commerce, hazardous waste management, and forestry (Beierle & Konisky, 2000; Cvetkovich & Löfstedt, 2000; Govier, 1997; Kyllönen et al., 2006), no research was found that applies these approaches to drinking water governance. Therefore, the primary question that will need to be answered during the course of this study is:

 Can consumer beliefs and values about societal conditions³ be used as an indicator of the type of water governance system that a consumer would trust?

Secondary Research Questions

Although water is a common need of every human and some form of water governance exists in every human settlement, no information was found to show how the beliefs and values of consumers vary between service areas.

³ Refer to Appendix E for definition.

- Do differences in beliefs and values and trust in water governance systems exist between adjacent communities where one community has a water surplus and the other has a water shortage?
- Do differences in beliefs and values and trust in water governance systems exist between Canada and Mexico in the context of developed and developing countries?

Part 1: Theoretical exploration

My approach to determining the validity of a beliefs and values-based approach to water governance involves an extensive exploration of the relationship between societal characteristics and trust, the impacts of trust on governance, and variations in water governance systems. I start by looking at the interaction between 'the human right to water' and the 'the human right to self-determination'. I then consider the role of these rights in the context of good governance and sustainable drinking water management. My focus then shifts to water governance systems, the array of decisionmaking processes that dictate water access and use, and the role that beliefs and values play in the ability to trust⁴ these systems and the decisions of others. With the resulting theoretical framework in place, I propose an approach to water governance design that draws on the beliefs and values of consumers to create water governance systems that are trusted by consumers and that realize sustainability and human rights.

⁴ Refer to Appendix E for definition

Part 2: Practical Exploration

The practical exploration tests the theoretical framework in the real world, by using an exploratory survey that seeks to find answers to the three study questions. As noted above, wherever human settlements exist, water governance systems are present and take many forms. A Water Service Area (WSA) is a geographical or political area whose population (referred to as 'the consumers' or 'the public') is provided with water by a water service provider (the provider) that is guided by the operating principles of the existing WGS. The boundaries of these areas, typically decided on by the most influential of the stakeholder groups (primarily government decision-makers), vary in size with socio-economic and political characteristics, density, population, and environment.

Two water service areas (also referred to as communities) in Canada and Mexico have been chosen as study areas to explore for answers to the study questions. The study areas are similar in many ways, while also very distinctive, allowing for a comparison between communities in developed and developing countries with and without water scarcity issues. Given the unique characteristics of each community and time constraints, the study combines methods, using a qualitative exploratory survey in Mexico administered orally and a quantitative exploratory survey in Canada administered using the internet. Once tabulated, the findings of the practical exploration are interpreted and summarized by study question linking the findings to the theoretical framework developed in the theoretical exploration.

Part 3: Application

The focus then turns towards how to use the findings of this study to move towards a beliefs and values-based approach to water governance that realizes human rights and sustainability. The criteria for creating beliefs and values-based governance systems are discussed⁵. An implementation strategy for such an approach is offered as is a non-technical description of a tool to translate consumer beliefs and values into WGS that are trusted by consumers and are able to realize human rights and sustainability. The implementation strategy is broken down by stakeholder group, demonstrating the role each group has in a beliefs and values based approach to water governance and the benefits they will see to such an approach.

⁵ These types of WGS maximize consumer trust by paralleling those things that consumers have a firmly held opinion on (beliefs) or consider to be of importance (values).

PART 1: THEORETICAL EXPLORATION

Bridging Theories

The following section presents and bridges theories traditionally considered independent of drinking water governance and each other. This draws on research from a variety of disciplines including ethics, risk management, human rights, sociology, anthropology, and international development. I begin with a description of the human right to water and the right to self-determination and their realization as *outcomes* of a water governance system. This is followed by a discussion of sustainability and good governance as *mechanisms* for facilitating human rights through water governance. Public participation and trust are then offered as *drivers* that enable good governance and sustainability in the context of water governance. Ultimately, beliefs and values are offered as the *origin* of trust. The outcome will be a theoretical framework for a consumer beliefs and values-based approach to drinking water governance design (see Figure 1).



Figure 1. Theoretical framework for a consumer beliefs and values-based approach to drinking water governance design

Using Consumer Beliefs and Values in the Design 11

Outcomes

The Human Right to Water...A Belief

Synopsis: The right to water is an internationally accepted and guiding belief that is not

limited to water-rights activist groups, yet debate rages on about how to secure this

right.

"Everyone has the right to life, liberty and security of person."

(United Nations, (December 1948). Article 3. Universal Declaration of Human Rights)

"...in no case may a people be deprived of its own means of subsistence."

(United Nations, (January 25, 1997). Article 1.2. The United Nations International Covenant on Civil and Political Rights)

"Water is fundamental for life in human dignity. It is a pre-requisite to the realization of all other human rights."

(United Nations Committee on Economic Social and Cultural Rights, U. (January 2003). The Right to Water, General Comment No. 15 E/C.12/2002/11. *International Covenant on Economic, Social and Cultural Rights*)

As these statements demonstrate, the Human Right to Water is among the most influential beliefs of the human race, fundamental to all other human rights. Since the 1970's, the international community has implicitly recognized the human right to water in several documents (United Nations World Water Assessment Programme, 2003), but it was not until 2002 that the human right to water was explicitly recognized by the adoption of General Comment 15 on the right to water by the UN International Covenant on Economic, Social, and Cultural Rights (CESCR). Although General Comment No. 15 does not recognize a right to *free* water, it establishes an obligation of signatory states to provide 'sufficient, affordable, physically accessible, safe, and acceptable water for personal and domestic use' (COHRE, AAAS, SDC, & UN-HABITAT, 2007; United Nations Committee on Economic Social and Cultural Rights, 2003) economically affordable access to water and water services. As of October 11th, 2007, 157 states were party to this treaty (Office of the United Nations High Commissioner for Human Rights, 2007).

The obligations of governments to maintain human rights are summarized by three principles: respect; protect; and fulfill. *Respect* for the human right to water, requires parties to the CESCR to refrain from any conduct that may interfere with the enjoyment of this right. This includes practices that may deny equal access to drinkingwater or the unlawful pollution of water by state-owned facilities. Parties must also *protect* this right by preventing third parties from interfering in any way with the enjoyment of this right. Furthermore, they must adopt measures necessary to progressively *fulfill* this right, acknowledging that specific factors such as regional water scarcity may impede this right (United Nations Committee on Economic Social and Cultural Rights, 2003).

Many civil society groups have demanded a more binding approach to the right to water that would ensure affordable access to clean water, secured and protected as a human right worldwide. They believe that access to water would be guaranteed by transparent, democratic water systems, locally owned and controlled, preventing governments, private industry, and international financial institutions from impeding the realization of this right (Naidoo, 2007). In an effort to maintain their business interests, the private water industry and international financial institutions have endorsed the human right to water by adopting the right to water rhetoric of civil society with fundamental differences. Unlike civil society, these economic groups believe the debate over how to achieve the right to water should be closed in order to permit action to ensure the right. This would begin with governments identifying the local public authority responsible for the implementation of the right to water, their duties, and their financial resources. This public authority can then make use of "efficient" (private) water operators to produce results (Payen & Moss, 2007).

These polarized views held by civil society and the water industry on the world of water rights and water governance are championed by several groups. The Blue Planet Project, an international civil society movement begun by the Council of Canadians, along with its many partners and supporters spearhead the civil society push for the right to water and public control. Meanwhile private industry such as Suez and Veolia, and financial institutions such as the World Bank use the newly formed International Federation of Private Water Operators known as *Aquafed* to push for the right to water and the role of private industry. The opposing viewpoints held by the members of these civil society and private industry groups form the epicentre of ongoing international debate.

The Right to Self Determination...the forgotten belief

Synopsis: When exercised, the right to self determination ensures the appropriate societal conditions are present for a policy to succeed and that the policy mirrors the public's beliefs and values.

"1. All peoples have the right of self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development."

(United Nations, (January 25, 1997). Article 1.1. The United Nations International Covenant on Civil And Political Rights)

This is the first right identified in the UN International Covenant on Civil and Political Rights. As of July 20, 2007, 160 nations were party to this legally binding covenant. The Covenant recognizes that in order to preserve the ideal of free human beings, able to enjoy civil and political freedom and freedom from fear and want, conditions must be created whereby all may enjoy civil, political, economic, social and cultural rights. To achieve this, the Covenant requires member parties to, among other things, ensure a competent judicial system, protect the individual's freedom of choice (self-determination), their right to peaceful assembly, and to take part in public affairs (United Nations, 1997). The intended outcome of this Covenant is good governance, ensuring the protection of all human rights and freedoms.

The right to self-determination allows us to develop our lives and communities in ways that are in accordance with our beliefs and values and those of our neighbours. It gives us the ability to tailor our political, economic, and social systems to these values and the local conditions that make each community and every country unique (Stiglitz, 2002). Tending to these unique circumstances is a vital part of good governance and requirement to achieving the intended outcomes of any policy. The realization of this right requires that "every citizen shall have the right and the opportunity...(t)o take part in the conduct of public affairs, directly or through freely chosen representatives." (as described by Article 25 of the United Nations International Covenant on Civil and Political Rights, 1997)

Self-determination through participation is both a human right and a fundamental attribute of good governance (see p.35). This right is alive and well in theory, recognized as key to achieving such things as political stability and the UN Millennium Development Goals (United Nations, 2008b)⁶. Yet, in practice this right is often forgotten or denied when communities and countries are required to adopt policies.

The efforts taken by the IMF and the World Bank to improve the efficiency of governments and infrastructure in developing countries by vigorously pursuing and fast-tracking privatization and market liberalization in such countries in the absence of the capacity for good governance illustrate this point. Joseph Stiglitz, renowned development economist and former Senior Vice President and Chief Economist of the World Bank, believes the efforts of these institutions have tended to fail because they take a narrow ideological approach and lack sequencing (Stiglitz, 2002). In other words, poor policy performance has been a result of the tireless pursuit of a single remedy to the very complex circumstances of developing countries, in effect ignoring that the many preconditions required for such economic practices do not exist in all countries. These include an established tradition of property rights, competition, and perfect information as well as other legal and economic instruments. It's not just enough to have these preconditions in place as legal writings or infrastructure, they need to be part of the public's view of the world (Stiglitz, 2002), their beliefs and values, much like they are in countries where liberalization and privatization originated and thrive.

⁶ The UN MDGs are a set of eight goals that 189 member states of the UN have agreed to try to achieve by 2015 The goals address issues such as poverty, hunger, sustainability (which includes access to safe drinking water), HIV/AIDS, gender equality, and universal education (United Nations, 2008b).

While there is no denying that developing countries must receive assistance, Stiglitz believes that the role of international economic institutions should be to educate countries of the consequences and risks of each alternative for such things as economic systems rather then imposing their own beliefs and values upon the country and its people. The citizens of a country must be left to weigh the alternatives and through a democratic political process, make their own choice as to which alternative best suits their condition and values (Stiglitz, 2002). "The essence of freedom is the right to make a choice ---and to accept the responsibility that comes with it." (Stiglitz, 2002).

Headwaters

There are many ways to realize the right to water, but not everyone considers all methods appropriate. Furthermore, not every method works in every situation. The right to self-determination exists to ensure that how we govern our communities is harmonious with our beliefs and values and the local conditions in which the policies must function. In the context of water governance, the right to self-determination guarantees that the public has the opportunity to inform the design of a water governance system and thereby choose what they feel is the most appropriate way of realizing the right to water given their situation.

Water governance systems, like economic or political systems, need to be built on the values systems of the public with the existing unique societal conditions⁷ in mind (United Nations World Water Assessment Programme, 2003). Through public

⁷ The term 'societal conditions' is my own. It is the result of a need to consolidate the variety of views from various authors (Castelfranchi & Falcone, 2001; Delhey, 2002; Fiske, 1992; Govier, 1997) regarding the characteristics of a community. Refer to Appendix E for definition.

participation and self-determination, public values and societal conditions set the foundation of the social infrastructure necessary to support these systems. For example, democracies and liberal economic systems cannot exist if the public values do not include universal suffrage and property rights combined with the existence of judiciary system and a form of currency (Stiglitz, 2002).

When international development banks, specifically the World Bank and the International Monetary Fund (IMF), have approached debt-ridden developing countries with debt forgiveness, their offer frequently comes with a catch in the form a structural adjustment program. These programs involve the privatization and liberalization of publicly managed infrastructure, including drinking water systems, without any consultation with community members by these banks or the national governments. While these banks offer several different models of privatization (market systems) to pick from, they only offer privatization without guaranteed public participation. The country is not offered a choice of systems and its people denied the opportunity to have input into the design of the system (World Bank. & PPIAF, 2006). For a developing country that faces billions of dollars in debts, a dwindling economy, and social unrest, there is only one choice to lessen the burden: accept the Banks' offer and embrace privatization. This process, devoid of public participation and evaluation of local conditions, has been the status quo for reforming water governance systems in developing countries. The result has been public protest and poor governance performance as seen in such countries as Bolivia, Ghana, and Argentina (Barlow & Clarke, 2002).

The right to self-determination through participation in water governance has also been revoked in developed countries. For example, the city council of Stockton, California, denied its residents the right to vote on a 20 year, \$600 million water service contract with a multinational water corporation despite community member collecting 18,000 signatures in opposition of the contract, more than enough to trigger a referendum,-enabling them to vote (Goodman, 2007).

The validity of privatization as a model for drinking water governance is not in question at this point. What should be in question is whether the human right to water has been achieved while guaranteeing the users right as a human to self-determination through participation in public affairs. This is a standard argument against international trade policies developed with little public participation, such as the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trades (GATT). Whether or not these trade policies can realize the right to water will not be argued here. What should be noted is that these trade policies have the power to overrule national and local water conservation policies (Ederington & Minier, 2003; Barlow, 2007), policies designed by local and national governments based on their societal conditions and public input. As a result, these trade policies could cripple the public's right to water by denying their right to choose how they achieve this.

Private industry and civil society advocate a single approach to water governance (i.e. a market system or public system, respectively) as a means of realizing the human right to water. However, a single type of water governance system cannot protect human rights as it does not account for the unique needs of consumers and the unique conditions of their water service area. The right to self-determination exists so that institutions support public participation in the development of policies that will satisfy their needs (e.g. access to water) in a way that conforms to their beliefs and the features of their society. A single umbrella governance approach to implementing the right to water is devoid of choice. The right to water without the right to choose how it's governed is an empty promise that can lead to a failure to meet consumer needs.

Governance and Governance Systems

This exploration into realizing the human right to water and self-determination leads to the door step of governance, the arena where self-determination through public participation meets decision-making and the realization of the right to water.

Governance and government are not the same. Government refers to those individuals who are in a position to make decisions for the general public. Governance, however, is an inclusive concept that actively recognizes the relationship and dialogue between society and government (Rogers, 2002). This includes the various interests of civil society, government, and the private sector as well as the partnerships, and networks that exist between them (Pierre, 2000).

The notion of a 'governance system' comprises "all social, political and economic organizations and institutions, and their relationships, insofar as they are related to the realm of the public policy being discussed." (United Nations World Water Assessment Programme, 2003)

Water-Resource Governance

The water governance systems born from the relationship of society are "concerned with how institutions rule and how regulations affect political action and the prospect of solving given societal problems, such as efficient and equitable allocation of water resources" (United Nations World Water Assessment Programme, 2003).

While water resource governance systems (WGS) share a common goal (to allocate water resources), there are many different ways governance systems can manifest themselves to accomplish this goal. The three common variations of WGS are

community, public, and market (Bakker, 2003). Each system is unique, the product of stakeholder relationships, the different schools of thought about the desired outcomes of a WGS, and how to achieve these outcomes.

The qualities which make them unique can be referred to as operating principles. These principles include the systems orientation to water (whether water is considered a commodity, commons, etc.), the level of consumer involvement in decision-making, and the transparency of operations, and equity. The operating principles also determine the type of water service provider and serve to guide the decisions and actions of providers. Service providers include: a community (consumer) group, a government-owned corporation (Bakker, 2003), or a private corporation. In other words, WGS operating principles are the expression of the institutional beliefs and values that determine what form the governance system will take and how it will function to meet its goals.

Table 1 summarizes the various operating principles that exist for three of the most common water governance systems (Bakker, 2003; United Nations, 2003; United Nations World Water Assessment Programme, 2003; World Bank. & PPIAF, 2006).

Operating Principles	Market	Public	Community	
Source Property Rights	Private or	Government (level of		
(source owned by)	Government	government may vary)	Community	
Asset Owner	Private Corp	Government	Users	
Asset Manager (service provider)	Private Corp	Government	Users	
Organizational Structure	Corporation	Civil Service	Association/cooperative	
Provider Motivation	Maximize profit Efficient output	Minimize risk, meet legal requirements	Serve community interests Effective performance	
Orientation to environment (provider)	Commodity	Commodity/Commons	Commons	
Access to Water	Economic equity	Equality/Economic Equity	Equal	
Accountability	Government	Consumers?	Community members	
Accountability Mechanism	Contract	Service Hierarchy	Community Norms	
Decision-makers	Experts, companies, individual (tap end only)	Experts, public officials,	Leaders and members of community organization	
Participation of Consumers (method and degree)	Individualistic, minimal	Collective – top down, minimal	Collective – bottom-up, significant	
Consumer Role	Customers	Citizens	Community members	
Transparency	Minimal	Moderate	Significant	

Table 1. Operating principles associated with the three generic water governance systems.

Operating principles are defined and selected by the stakeholder groups actively participating in the dialogues and decisions that take place during the design stage of the governance system (Bakker, 2003). These dialogues can take the form of community meetings, contract negotiations, meetings with lobby groups, and other such forums for stakeholder engagement (United Nations World Water Assessment Programme, 2003). During these dialogues, each group involved is seeking to satisfy their own interests based on their perception on how best to meet the needs of the water service area given the various local conditions. Since the stakeholder groups involved in the dialogue can vary, a range of water governance systems is possible.

For example, the World Bank's water privatization toolkit outlines five possible hybrids of a market governance system (e.g. management contract, affermage-leases⁸, lease, concession, and divestiture), all distinguished by different combinations of operating principles such as who has the property rights to the source and the degree of public participation (World Bank. & PPIAF, 2006). These systems are a reflection of the perspective held by the World Bank and private industry, representing what they believe to be the best method of securing clean and affordable water for the masses. On the other hand, the dialogues between the public and government typically produce water governance systems that partner these two stakeholders as joint owners of the delivery system, with the level of public participation unique to this type of governance system (United Nations World Water Assessment Programme, 2003).

⁸In Affermage-Leases the operator is responsible for operating and maintaining the business, but not financing investment

The types of water governance systems can be placed along a continuum (see Figure 2), with their position determined by the degree of difference between their respective operating principles. As we move from left to right along the continuum, consumers play a reduced role in the decision making process while private control/ownership of infrastructure and source increases. Along the continuum, between each of the common systems, are the various hybrids that may arise from stakeholder dialogues.



Figure 2. Water governance systems situated along a continuum indicating the degree of difference between their respective operating principles

Past: Condition Oriented

The governance of water is not a new concern even though it may now just be entering the public eye. Over the course of history every civilization has developed water resource governance systems. Historically, these systems were explicitly tailored at the community level to complement the environmental, social, religious, and economic conditions.

An example of this can be found in the history of the indigenous Hawaiians. Prior to the arrival of European explorers, Hawaii's water-resource governance system was intricately designed to meet the numerous conditions arising from the island environment and the Hawaiian culture. The system reflected Hawaiian beliefs about the connection between gods, humans, and nature, and the expectation by the gods that humans manage, use, and protect nature appropriately (Berry, 2007). In an effort to create self-contained communities that conformed to these beliefs, Hawaiians divided the islands into *ahupua'a*. These areas were shaped like a piece of pie, with the large end along the coast and the small end at headwaters of the mountain. The *ahupua'a* area was designed to give the community all the means it required to survive: fertile land, ocean, and freshwater (McGregor (1996) in Berry, 2007). From these beliefs the operating principles of the water governance system arose. The result was a water governance system that determined access to water based on the individual's contribution of labour in maintaining the intricate delivery system (Nakuina (1893) in Berry, 2007). Maintenance of the delivery system and the allocation of water for domestic and farming use in each *Ahupua'a* were administered by a *luna wai* ('water master') chosen by the konohiki, the individual responsible for the *ahupua'a*. The interconnectedness of water and governance in Hawaiian culture was such that the Hawaiian word for law (*kanawai*) was derived from water, which means sharing of the waters (Handy & Handy (1991) in Berry, 2007).

Further examples of WGS tailored to the local societal conditions can be found wherever human settlements have existed. For instance, military settlements, such as the English barracks that occupied the arid rock of Gibraltar, had governance systems for water resources. The quantity of water allotted to each member of the military community reflected rank, gender, and age (Sawchuk, Burke, & Padiak, 2002).

In most of the Middle East and Northern Africa (MENA) where water resources are very scarce, the operating principles of the water governance system have been historically founded in the Islamic religion. The Quran goes so far to say that on the day of resurrection, Allah would ignore three people including "a man [who] possessed superfluous water on a [the] way and he withheld it from the travellers." (Al-Bukhari 3.838 as quoted in Faruqui, Biswas, & Bino, 2001). This belief was realized as an operating principle of water governance by Othman (a companion of the Prophet), who bought the well of the Arabian settlement of Ruma and made its water available free to the Muslim community (Faruqui, Biswas, & Bino, 2001).

Present: Goal oriented.

Over the centuries growing populations and their environmental impacts have changed the social, political, and economic conditions of our communities. These mechanisms drove our innovation and imagination to design new organizational forms that meet our changing values and beliefs. These changes took the form of new social structures (e.g. class-systems and religions) and systems of government capable of meeting the needs of more people evolved and new economic theories and systems developed to meet expanding commerce and growing demands.

The governance of water resources has also changed to meet the variety of changing societal conditions of water-service areas such as political systems, community structures, social hierarchies, and economic systems. Even effective WGS have needed to evolve in order to manage the changing local conditions, sometimes leading to a centralized or decentralized public system. The same point applies to municipal WGS (public) that have transitioned to private systems.

However, not all cases of governance reform have been positive. The mechanisms guiding the reform of WGS have changed; WGS reform is now driven by the goals of stakeholders other than consumers, shifting away from bottom-up, condition oriented approaches. An instance of this occurred in East Africa when private foreign companies sponsored by development agencies dammed a river to create electricity

and help regulate irrigation without considering local practices and environment (Adams & Anderson, 1998). Without the input of the public, developers failed to recognize that the region's farming methods were dependent on the river's annual flood pattern, which allowed locals to produce a variety of crops in one year. The dam, despite its good intention, threw the economy and livelihood of the communities reliant on this environmental cycle into a state of shock. The communities affected can only produce one crop because of the disruption of water flow. This effort failed because it was focused on the goal of the government and private industry and not the societal conditions of the local area (da Ponte, 2003).

The system reform in Cochabamba, Bolivia, faltered for similar reasons. The market style WGS that replaced the public system did not reflect the economic, social, and political conditions of Cochabamba (Moss, Wolff, Gladden, & Guttieriez, 2003). The outcome was prolonged public protest leading to the return of the WGS to an improved version of the previous public system. At the time Cochabamba's societal conditions included economic corruption, political instability, lack of public representation, dependence on affordable access to water, and poverty. The goals of the stakeholders pushing the reform were focussed on the development and the delivery of water through the liberalization and privatization of publicly-owned infrastructure. These stakeholder goals (profit and efficiency), not the local societal conditions for liberalization and privatization; they included an established tradition of property rights, competition, and perfect information as well as other legal and economic conditions. These societal conditions did not exist in Cochabamba (at the time) in a form that would support a market WGS to organically develop and thrive.
General Synopsis I

This exploration began with the discussion of the human rights context supporting a common global belief in the "right to water". The belief has been officially recognized by most of the human community; however, the details of how to guarantee this right are still at the centre of international debate. The discussion then turned to the "right to selfdetermination", another belief officially identified by the international community as a human right. The preservation of this right requires that all people are given a choice and are able to participate in the governance of their communities. These two rights crossed paths as the exploration identified that guaranteeing both of these rights is critical to promoting universal human rights. However, given the importance of water resources and the increasing pressures applied to them, the right to self-determination needs to be considered if one hopes to fully realize the human right to water. This was made apparent by the events in Cochabamba, Bolivia and Stockton, USA where the public had no front-end choice or opportunity to participate in water governance.

The preservation of human rights set the context for comments on the concept of water governance, the attributes of the various systems, and how the mechanisms guiding the design of these systems have changed through time. This comparison of systems past and present has shown that over the course of history the mechanisms guiding the design of WGS has shifted from an emphasis on the societal conditions of the water service area, to the goals of the most influential stakeholder group (typically industry and/or government). This shift of mechanism has led to the design of WGS that can deteriorate in a service area that does not have the necessary set of value system-based, participative decision-making societal conditions present.

To realize human rights as an outcome of water governance, new mechanisms need to be considered. These mechanisms should yield successful WGS tailored to the local societal conditions. To mechanisms with this potential are 'good governance' and 'sustainability'.

Mechanisms

Human Rights through Good Governance

"Transparent, responsible, accountable and participatory government, responsive to the needs and aspirations of the people, is the foundation on which good governance rests, and such a foundation is a sine qua non [requirement] for the promotion of human rights..."

United Nations Commission on Human Rights, T. (April 25, 2001). Commission on Human Rights resolution 2001/72. *The Role of Good Governance in the Promotion of Human Rights* : The United Nations High Commissioner for Human Rights.

In 1998, the World Bank used the concept of 'good governance' to identify several governance traits as benchmarks to gauge the performance of the prevailing administrative structure of a country, specifically that of aid donors and recipients. The Bank believed that a country that met these benchmarks would have lower transaction costs, thereby preventing corruption and increasing financial efficiency (United Nations World Water Assessment Programme, 2003). This would certify the structural integrity of the donor government, an important precondition to ensuring they can be an efficient medium of multilateral aid investment to developing countries (aid recipients). In more recent years the concept has been used by development banks as a condition for aid or loans to ensure recipients make reforms towards good governance. This has resulted in some contention since the promotion of good governance has been seen by some as a means of masking the World Bank and IMF agenda of market reform through liberalization (Chowdhury & Skarstedt, 2005; Woods, 2000)

The meaning and uses of the concept of good governance are in constant evolution. The promotion of human rights requires an enabling environment, especially in developing countries. As such, the concept of good governance has been adopted by the human rights movement as an essential mechanism to creating an environment that enables the realization of human rights. The Office of UN High Commissioner for Human Rights (OHCHR) issued Resolution 2000/64 to legitimize the importance of good governance in the promotion and protection of Human Rights. The Resolution defined the five key attributes of good governance (Chowdhury & Skarstedt, 2005; United Nations Commission on Human Rights, 2000; United Nations, 2008):

- Participation
- Transparency,
- Responsibility,
- Accountability, and
- Responsiveness (to the needs of the public)

The attributes of good governance are to some extent interdependent (United Nations Development Programme, 1997), each one an outcome of the other four while also reinforcing and enabling the others. However, public participation plays a superior role in initiating good governance and promoting human rights, in particular the "Right to Self-Determination." The public must participate in a dialogue with decision-makers in order for a governance system to listen and respond to its needs. If the public are to participate in an effective manner they need to have access to information regarding the actions of government, which is only possible if the government is transparent. Without an engaged public to hold the government accountable, the government may not act in a responsible and law-abiding manner. Once the public feel they are able to influence government actions they will be more willing to participate, thereby strengthening the

good governance system. This level of public interaction with their governance systems satisfies the public's right to self-determination while guaranteeing their human rights are also realized.

Further recognizing that these attributes parallel many of the civil, political, cultural, economic, and social rights set out in the UN covenants on human rights, the OHCHR issued resolution 2001/72 (United Nations Commission on Human Rights, 2001) to the UN Millennium Declaration reaffirming the role of good governance in the pursuit of human rights. The United Nations Development Programme followed suit by expanding the definition of good governance to include four more attributes (United Nations, 2008a; United Nations Development Programme, 1997) whose effectiveness hinges on public participation. These attributes include:

- Effectiveness and Efficiency
- Equity and Inclusiveness,
- Consensus orientation, and
- Strategic Vision⁹

The concept of good governance shares a common foundation with the human right to water and the right to self-determination. It too is a reflection of a set of values (United Nations General Assembly, 2005). Good governance is an expression of human rights, representing many of the common values held by the human community. It is the manifestation of these values as well as the mechanism for realizing them.

The level of public participation that accompanies good governance ensures that the views of the community as well as the other stakeholders are heard and used to

⁹ This strategic vision would consist of a long-term vision of the leaders and the public which is grounded in the understanding of the historical, social, and cultural complexities of their perspectives.

formulate policy. This can only be achieved through decentralized governance and the Principle of Subsidiarity; management at the lowest appropriate level. When subsidiarity is practiced it provides decision-makers with stakeholder input to and insight about (most importantly from the public) local societal conditions, allowing decision-makers to tailor pending policies to these conditions (United Nations World Water Assessment Programme, 2003). Societal conditions include¹⁰:

- Societal interactions (e.g. how decisions are made, resource distribution)
- The existing social and structural institutions including their processes¹¹;
- Reliance on the environment and its quality;
- The relationships between community members; and
- The history of the conditions in the community.

These conditions manifest themselves in unique combinations in every community, and hence can only be incorporated into decision-making in the presence of decentralized governance and subsidiarity.

¹⁰ The term 'societal conditions' is my own. It is the result of a need to consolidate the variety of views from various authors (Castelfranchi & Falcone, 2001; Delhey, 2002; Fiske, 1992; Govier, 1997) regarding the characteristics of a community.

¹¹ These institutions, systems, and processes include, but are not limited to, government, industry, economic institutions and processes, religion, and civil society.

Sustainability and Good Governance

The attributes of good governance, in particular public participation, provide the necessary conditions to promote sustainability by ensuring subsidiarity.

A fundamental shift in the development, implementation, and outcome of public policies will be required to realize sustainability. A society where the social, economic, political, and environmental needs are factored into decisions and realized in the outcomes will have a very different set of regulations, requiring flexibility with regard to what people do and how they think. To make sustainability a reality requires a strong public commitment to implement decisions as well as a commitment by government to listen and act on the outcomes of shared decision-making processes that reveal, balance, and accommodate a full spectrum of interests (Owen, 1998). This requires a degree of subsidiarity to address local needs and conditions, empower local people, create self-reliance, and social justice (United Nations World Water Assessment Programme, 2003). It is for these reasons that the sustainability movement has also adopted good governance as a necessary component for achieving its goals. During the World Summit on Sustainable Development (Earth Summit 1992) the Johannesburg Plan of Implementation was agreed upon as a means of achieving Agenda 21 and the Millennium Development Goals. The Plan states that:

"4. Good governance *within* [italics added] each country and at the international level is essential for sustainable development. At the domestic level, sound environmental, social and economic policies, democratic institutions responsive to the needs of the people, the rule of law, anti-corruption measures, gender equality and an enabling environment for investment are the basis for sustainable development." (United Nations, 2005) This excerpt from the Plan emphasises the importance the international community has placed on the role of good governance in creating the proper decision-making environment necessary for sustainability, with each of the nine attributes of good governance (recall the previous section) securing a unique requirement for sustainability. The UN Development Programme also recognizes that the presence of good governance guarantees the five components of sustainable human development which include (United Nations Development Programme, 1997):

- Empowerment
- Co-operation
- Equity
- Sustainability
- Security

Sustainability plays a dual role as both an outcome and mechanism in this theoretical exploration. As an intended outcome of water governance, like the right to self-determination and the human right to water, sustainability begins with good governance. Consequently, when the components of sustainable human development are realized through good governance, sustainability acts as a mechanism, reinforcing good governance and promoting human rights (as captured by empowerment, equity, and security).

General Synopsis II

"The Second World Water Forum in The Hague in 2000 identified water governance as one of the highest priorities for action and expressed the need to govern water wisely through the involvement of the public and in the interests of all stakeholders"

(United Nations World Water Assessment Programme, 2003, p371)

The prevalent top-down approach to water governance has resulted in a limited level of public participation, contributing to poor policy performance and a disregard for local societal conditions. In light of this, water governance reform has taken the stage as a top priority for industry, governments, and civil society.

Good water governance requires public participation in decision-making at the water service area level. This enables various stakeholders to share their experience, knowledge, understanding of the local societal conditions (United Nations World Water Assessment Programme, 2003, p378), the protection of human rights to water and the pursuit of sustainability. There are barriers to public participation which must be addressed by decision-makers maximize the benefits of good governance, and there are drivers, for instance trust, that facilitate public participation. These barriers and drivers are discussed in the following section.

Barriers & Drivers

Barriers to Participation

The future of WGS relies on public participation regardless of the governance model used and where it is applied. The process begins with a choice on the part of the citizen/consumer on whether to participate in the decision-making. This can be the biggest step (Lowndes & Wilson, 2001; Lowndes, Pratchett, & Stoker, 2001). A study of citizen perspectives on public participation identified three four reasons that citizens do not participate:

- A negative view of authority¹²
- A lack of awareness about the opportunities to participate
- Social exclusion (e.g. 'It's not for people like me.')

Many of the study participants felt marginalized for personal reasons (e.g. gender, race, and age), or they were not being heard, or the same individuals dominated discussion.

Those who participated in water resource governance contributed to the selection of the operating principles for the WGS. For example these principles would reflect whether participants believe in having a WGS with minimal public input or a high degree of public participation or something in between. These operating principles would also be influenced by the beliefs of those participants who are highly motivated by their

¹² This consists of the public view and experience that public representatives (e.g. councillors) tend to make promises and not deliver on them, the feeling that they are in it for themselves, and that they are inaccessible and unlikely to be interested in the concerns of citizens.

interests and who are effective communicators relative to those who are deterred from participating. If so, these principles would not reflect the beliefs of the non-participating stakeholders or even the broader public, leading to lack of support for, non-compliance with and ultimately even outright opposition to policies and programs, especially over the longer term.

Trust...Driving Participation

Personal trust in institutions is based on the belief that other actors in society will not harm or negatively alter one's circumstances, and at best, will try to act in one's best interests (Newton, K. 2006). It is reasonable to conclude in conceptual terms that the absence of trust can lead to disconnections between the governed and those who govern and that these disconnections will have adverse impacts on policy development and implementation. By extension it is also reasonable to conclude that the presence of trust in institutions and between stakeholders can contribute to economic growth and efficiency in market economics, stable and efficient as well as legitimate democratic government, the equitable provision of public goods, social integration, co-operation and harmony (Newton, K. 2006; Pellizzoni, 2003; Delhey & Newton, 2002; World Bank, 2002; Grootaert & van Bastelaer, 2002; Castelfranchi & Falcone, 2001; Govier, 1997).

In the context of water governance, trust plays a critical role considering that consumers delegate the responsibility of managing and delivering this essential resource to them and their families. Yet, trust is often taken for granted or not considered in water resource governance even though it can make the difference between effective water governance and failure. Consumer trust aids the creation and implementation of sustainable water management policy on three levels (Govier, 1997; Lowndes, Pratchett, & Stoker, 2001; Lowndes & Wilson, 2001; Newton, 2006).

a. Enables public participation:

The presence of trust overcomes public resistance to participate in governance, yet a level of distrust is also necessary to ensure a healthy civil society. Finding a balance is essential from the outset. Too much distrust impedes participation by the majority and creates a passive public. Civil-society groups will only represent the interests of those who are active participants, further intimidating the general public, and deterring them from participating (Govier, 1997; Lowndes, Pratchett, & Stoker, 2001).

b. Promotes consumer cooperation and compliance

Not only will the future of water resource governance require change in the institutional realm but also in the private realm of consumer behaviour. Water governance and management rely on soft systems-based public policy, requiring consumer buy-in and voluntary actions by consumers while relying on learning processes and procedural change rather than enforced restrictions and regulations. This applies especially in the case of water-conservation policies such as water-use restrictions. As such consumer trust in the WGS and other stakeholders is critical to promoting consumer cooperation and thereby facilitating the effective implementation of policy at the consumer level (Grimes, 2006).

c. Imposes responsibility and accountability while creating a productive decision-making environment

Furthermore, as the public becomes increasingly aware of the state of water resources locally and globally, their concern about securing access to the resource will inevitably grow. Security comes with knowledge that the WGS and the other stakeholders are trustworthy, capable and willing to make decisions to protect the interests of local consumers. This imposes a sense of responsibility on the service provider to perform for its customer, while also providing an active and productive decision-making environment for the provider, enabling the provider to make necessary decisions with limited consumer opposition.

Despite the potential of public participation, it needs to be accompanied by consumer trust in the WGS and trust between stakeholders to be successful.

Point of Origin: Beliefs and Values

Public participation and trust share a common origin as they both arise from our beliefs and values. This is important link to be aware of if we are to use public participation and trust as the starting point to promoting water resource sustainability and human rights. When individuals participate in governance, they bring their personal perspectives about the societal conditions of their community. At the heart of these perspectives lie their individual beliefs and values. These blur interpretations of reality, determining what people choose to observe, influencing their actions and shaping their perspectives of the world around them. The outcomes of these actions in turn reshape the individual's beliefs and values, guiding individual and collective action thus contributing to the shaping of society. This approach, known as the Ladder of Inference, was first put forward by organizational psychologist Chris Argyris and used by Peter Senge in *The Fifth Discipline: The Art and Practice of the Learning Organization* (Senge, 1990).

An individual's trust is directly impacted by their values as well as their general beliefs about societal conditions (Govier, 1997; Casterlfranchi & Falcone, 2001; Delhey & Newton, 2002). The similarity between beliefs and values, otherwise known as shared-beliefs, determine one person's willingness to trust another individual or institution. Studies conducted on issues of hazardous waste management and forestry have found that individuals' are more willing to delegate responsibility to actors (individuals or institutions) they believe share a similar set of beliefs and values (Cvetkovich & Löfstedt, 2000). Earle and Cvetkovich specifically studied the role shared values played in the acceptance and willingness of the public to trust a set of hypothetical management processes being proposed for nuclear waste (Earle & Cvetkovich, 2000).

This common ground of beliefs and values that links public participation and trust provides a new lens through which to view the future of water governance and to determine the necessary actions required to promote sustainability and the human right to water.

The Interaction of Beliefs and Values in Water Governance

Water governance when seen through a lens of beliefs and values enables an understanding of the interactions among consumer trust and participation, societal conditions, the operating principles of WRG, and policy performance. If the theory that trust between stakeholders arises from shared beliefs and values applies to consumer trust in WGS, then it should also be clear that consumer trust varies with the degree of alignment between the operating principles of WGS and consumer beliefs about societal conditions.

Among the societal conditions that factor into consumer trust are our beliefs about how law-abiding our neighbours are, their abilities to make decisions (in this case around water management), and their sense of equality and entitlement. Such social factors would play a role in how trustworthy individuals regard other community members, and hence whether they would delegate the responsibility water governance to a WGS that relied on a water-user organization (the community) as the service provider.

Trust also plays an important role in economics as it is founded on the exchange of goods between actors and mechanisms unique to each economic system. These systems may rely heavily on incorporated businesses (capitalist systems) and the exchange of currency, while others may have no formal system and no formal currency (barter system). Thus, insofar as water governance systems create the framework for the exchange of water resources, they use a similar set of actors and mechanisms as economic systems. Since trust grows with the frequency of successful interactions, with each positive outcome, consumers grow to trust the unique actors and mechanisms of their economic system. Introducing a set of actors and mechanisms that differ from those of the established local economic system may negatively impact consumer trust in the WGS. For example, consumers exchanging goods and services in a barter system may distrust a WGS using a capitalist system of private ownership or other such control and associated monetary exchange since the actors and mechanisms are very different from what consumers are accustomed to. Economic societal conditions that may

influence consumer trust in a WGS could include: our beliefs about monopolies (since piped water service is generally a natural monopoly), and our beliefs about economic actors and mechanisms (e.g. other consumers, corporations, transparency, equity).

The political conditions influencing consumer trust in a WGS function in a similar fashion as economic conditions; consumers trust what they know best and feel they can relate to. These factors would include consumer perceptions of government transparency, corruption, and capability. Such political conditions would play a role in consumer perceptions of government trustworthiness and therefore the degree of government involvement they would find acceptable in WRG.

The local environmental conditions, specifically quantity and quality of water supply, would factor into the degree to which consumers would be willing to trust other societal actors (neighbours, government, corporations) to govern their water supplies. People are generally risk adverse and therefore will seek to minimize the risk to their health and wellbeing due to deteriorating water supply. Perceptions of the quantity and quality of our water supplies may factor into the type of WGS individuals are willing to trust. After evaluating the situation, consumers could decide that the risk and benefits warrant a WGS that places full decision-making power in the hands of a water-user group (community management); alternately, they may feel experts should make all decisions (private or public management) as they regard their neighbours as incompetent.

With this new "lens" in place, what do we see when we look at water governance past, present, and future? If we recall the examples given earlier when we took a glimpse at the history of water governance, we see that the operating principles of the Hawaiian, Islamic, and military water governance systems are founded on the beliefs and values of those groups of individuals. Their beliefs and values are in turn a reflection of how they view the world they live in, in other words, their beliefs about their societal conditions. All three examples are a clear reflection of the public's interpretation of the environmental conditions where the groups reside, the social order they live in (hierarchical, government and economic systems), and the interactions between members of the groups. If the principle of 'shared-beliefs' holds true, then the members of these groups trusted their WGS as it mirrored their own values and beliefs.

Let's step forward to the present. The lack of public participation in WRG is common knowledge (United Nations World Water Assessment Programme, 2003) and does not need to be revisited. This lack of involvement means minimal consideration of consumer beliefs and values in decision-making and the reform of WGS. The result is a failure to address consumer trust in WRG, the impact on the sustainability of drinkingwater resources, and the retention of decision-makers and water service providers in civil service. These results have been observed in Tofino, B.C. and Cochabamba, Bolivia where failure to address consumer trust in the WGS prior to water shortages and reforms to the current WGS.

In Tofino, a drinking-water ban imposed due to severe water shortage had limited results as several businesses continued using water, sceptical of the gravity of the situation and not satisfied by the efforts of the municipal water purveyor to seek alternative water sources such as private water tanker trucks (Westad, 2006). This further aggravated the situation, increasing interpersonal conflict and strain on the water resources.

Consider for one final time the events that took place during the WGS reform in Cochabamba, Bolivia. The operating principles of the new WGS were highly

contentious as they did not reflect the societal conditions of Cochabamba at the time. This meant that the new WGS did not reflect consumer beliefs and values, specifically the consumer belief that consumers are entitled to sustained, affordable access to water. Consumer trust in the private management style of the WGS fell, then opposition increased, as decisions that were contrary to consumer beliefs and values continued to be made. Consumers organized large protests to initiate a change in the WGS and remove the corporation acting as service provider from this role. Within a year of the WGS reform, the service provider had fled the country and the public management style of WGS resumed (Nickson & Vargas, 2002).

In the future, the sustainability of water resources and the achievement of the Human Right to Water will be key to water resource governance. A dialogue of beliefs and values between consumers and other stakeholders will build consumer trust and initiate much needed public participation in WRG (Moss et al., 2003). Additionally, participation will provide decision-makers with a way of learning and adapting to shifting consumer values and changing societal conditions. In doing so, optimal levels of trust can be achieved between stakeholder groups and the potential benefits of this trust realized. Furthermore, incorporating consumer beliefs and values in the formulation of a WGS can yield a socially acceptable system that will create the proper environment for the intended results of sustainable water governance policies (e.g. conservation, equity, accessibility, affordability, meeting consumer needs, and clean drinking-water) (United Nations World Water Assessment Programme, 2003). Figure 3 illustrates these interactions.



Figure 3. A theoretical framework showing the process and outcomes of a consumer beliefs and valuesbased approach to the design of drinking water governance systems. The model takes a funnel shape in order to reflect the bottom-up and top-down nature of a belief and values based approach to water governance

PART 2: PRACTICAL EXPLORATION

Putting Theory into Practice

"A liberal is a person who believes that water can be made to run uphill. A conservative is someone who believes everybody should pay for his water. I'm somewhere in between: I believe water should be free, but that water flows downhill."

Theodore H. White (1915 – 1986) - American Journalist.

As T.H. White points out, we all have different views on how water should be governed, and these differ based on our beliefs and values. This exploration has shown the increasing need for dialogues that allow us to consolidate and address these various beliefs and values. Such dialogues are an opportunity to consider the design and operation of institutions that serve human needs and are therefore essential to the paradigm shift required to move communities towards a sustainable future. Such concepts as value dialogues (Moss et al., 2003), shared-values (Earle & Cvetkovich, 2000), and shared-ethics (Somerville, 2006), seek to bring a broader spectrum of stakeholder beliefs and values back into realm of governance. These approaches recognize that at the current pace of innovation and decision-making, it is more important than ever to consider our beliefs and values. However, as acclaimed ethicists Margaret Somerville has noted, very little 'ethics time' is made available (i.e. sufficient time to consider how our decisions in governance reflect our personal and collective beliefs and values on the issue in question) (Somerville, 2006). In recent years such decisions have, for example, included: nuclear energy, GM foods, cloning, child labour, war, and climate change. Many decisions on such issues have moved ahead with minimal 'ethics time'. It is no longer a matter of when we will be faced with the broadly

unacceptable impacts of decisions based on narrowly defined beliefs and values regarding water resources, but whether or not we make the time to have these dialogues before discordant public responses result in supply issues.

In theory a beliefs and values approach to WRG appears natural. As this exploration has shown, the path to sustainability and the promotion of human rights begins by accounting for consumer beliefs and values in the design of a WGS. This will ensure an effective WGS founded on consumer trust, cooperation, and participation. However, theory must be put into practice if we are to ensure the sustainability of water resources and the promotion of human rights.

If we build on the principle of shared-values, it is also be possible to create a viable planning tool to incorporate consumer beliefs and values into WRG. This planning tool would evaluate the optimal WGS, by translating consumer beliefs and values about local societal conditions into the operating principles of a WGS. The outcome would be a range of possible WGS that would maximize consumer trust, participation, and cooperation, setting the stage to meeting sustainability targets and securing human rights. Such a tool could help guide WGS reform in developed countries as well as developing countries. The tool would not be a substitute for public participation; in fact it would be an extension of this. It would initiate a dialogue with the public while informing decision-makers of the types of WGS that would be most likely to earn public approval and achieve its intended goals.

The remainder of this exploration will focus on answering following guiding questions that must be considered prior to designing such a tool:

 Primary Research Question: Can consumer beliefs and values about societal characteristics be used as an indicator of the type of water governance system that a consumer would trust?

• Secondary Research Questions A: Do differences in beliefs and values and trust in water governance system exist between adjacent communities where one community has a water surplus and the other has a water shortage?

• Secondary Research Questions B: Do differences in beliefs and values and trust in water governance system exist between Canada and Mexico in the context of developed and developing countries?

Bridging Methods

In order to effectively address the questions identified previously it's useful to break them down into their dependent and independent parts. These questions are concerned with three independent variables as outlined in Table 2. As the previous discussion on trust demonstrated, trust can exist as either an input or an output of society and its interactions. However, through a lens of shared beliefs and values, trust is viewed primarily as an output. As such, the three study questions share 'trust' as a common dependent variable.

Question	Dependent Variable	Independent Variables
Primary Question	Trust	Beliefs and values about societal characteristics
Secondary Question	Trust	Developed/developing country
Secondary Question	Trust	Historical surplus/shortage of water

Table 2. The variables being explored by each of the study questions.

The study location and the exploratory methods needed to address the specific requirements of these study questions are described in the following section (Miller & Salkind, 2002; Leedy & Ormrod, 2004).

Study Locations

As water and trust are common threads in any society, it was expected that the geographical location of the study would not influence the findings with respect to the primary study question. However, specific locations had to be chosen in order to meet the criteria of the independent variables for the secondary questions. The criteria consisted of study locations in developed and developing countries with instances of water shortage and water surplus in recent history that were also in close proximity to one another. Two communities in Canada and two in Mexico met these criteria and

were chosen as study locations¹³. Table 3 provides a brief summary of various attributes of the two Canadian and two Mexican study communities.

		Status of	Water Resource	Environmental	Local	
Country	Country Community D		Governance System	Conditions	Economies	
		resources				
	Ucluelet		Public Management	Coastal	Commercial	
	(pop. ~1600) Surplus (municipal water utility		(municipal water utility)	Temperate	Fishing	
Canada			(municipal water utility)	Rainforest	Fishing	
	Tofino	no Pocont summor Public Managomoni		Coastal	Tourism &	
	(2.2.2. 4000)	shortage (2006)	(municipal water utility)	Temperate	Aquaculture	
(po	(pop. ~1900)			Rainforest		
	Puorto San		Public Management	Sonoran Desert,		
	Carlos	Frequent	(national planning	Magdalena	Growing tourism	
		shortage	administered by	Region	& Aquaculture	
	(pop. ~ 3200)		satellite offices)	(Coastal)		
Mexico			Consumer/Public	Concren Decert	Cooperativa	
	Puerto		Partnership	Sonoran Desert,		
	Magdalena	alena Surplus	(Desalination plant	Magdalena	Aquaculture &	
	(pop. >1000)		iointly owned, operated	Region	Commercial	
			by fishing cooperative)	(Coastal)	fishing	

Table 3.	Comparison	of various	attributes of	of the	study	communities.
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¹³ These communities were also chosen for accessibility and my basic familiarity with them from past recreational and training visits. The presence of an established field research school in Bahia Magdalena benefited me with a place from which to conduct my research and the necessary relationships with the community.

Canada: Tofino & Ucluelet, British Columbia

The locations for the Canadian portion of this study included Tofino (population 1900) and Ucluelet (population 1600), B.C. These communities are located approximately 30km apart on the west coast of Vancouver Island. Both communities are situated in the Coastal Temperate Rainforest of British Columbia, and experience average annual rainfall of 324cm of rain (Travel.bc.ca, 2008). Tofino's economy consists largely of tourism, aquaculture, and logging (Tofino Business Association, 2008) while Ucluelet's has historically relied on commercial fishing and logging with tourism (District of Ucluelet, 2008) becoming increasingly important . Water resources of Tofino and Ucluelet are managed independently. Both communities have a "Public Management" WGS in the form of District managed utilities, which is typical in Canada. As a means of promoting conservation, consumers in both communities pay service fees which fluctuate with the season (District Of Ucluelet, 1995; District Of Tofino, 2006)

During the summer of 2006 Tofino suffered a severe drought. Although Tofino typically endures a drought every summer, the drought of 2006 was far more severe than any previous. Several reasons for the extreme water shortage have been proposed such as poor management and failure to create appropriate contingencies in the event of below normal precipitation (Westad, 2006). A drinking-water ban was imposed on commercial and domestic customers, which had severe outcomes on the community's seasonal tourism industry which was at its peak during the drought. The ban had limited results as several businesses continued using water. They were sceptical of the gravity of the situation and not satisfied by the efforts of the municipal water service to seek alternative water sources such as water tanker trucks (Canadian

Broadcasting Corporation, 2006; Westad, 2006). The drought lasted approximately two months. Since the drought there have been improvements to the management plan, system efficiency, and emergency response (District of Tofino, 2008). Despite its proximity, for reasons unknown Ucluelet did not endure such severe conditions.

Mexico: Puerto San Carlos and Puerto Magdalena, Baja California Sur¹⁴

The communities chosen for the Mexican portion of the study are Puerto San Carlos (population ~3200) and Puerto Magdalena (population >1000). They are located approximately 20km apart over water in Bahia Magdalena in Baja California Sur. Both communities are situated in the Magdalena Region of the Coastal Sonoran Desert of Mexico. The area experiences an average annual of >6cm of rain, mostly in the summer (Brusca, 2000). The economy of Puerto San Carlos consists largely of tourism, aquaculture, and fishing while Puerto Magdalena is among the most successful commercial fishing cooperatives in Mexico.

Puerto Magdalena is a rural community accessible only by boat. Permission to live and work in the cooperative community is given by the cooperative's council. Failure to live by the rules of the cooperative has resulted in some members being outcast or their membership into the cooperative revoked, at which point they must leave the community. Puerto San Carlos is an open community with sources indicating that 100 cooperative organizations exist in the community. Furthermore, the community is extremely diverse with approximately 10 religions being practiced.

¹⁴ The following information was assessed during a previous research visit conducted in 2005 and confirmed through dialogues with community members as part of this study.

Water resource governance in Mexico is for the most part a form of Public Management consisting of a central planning body at the national level, with regional and district offices to manage at the local level. The national body is known as CONAGUA the Comision Nacional del Agua (National Water Commission, CNA) is responsible for enforcing the Ley de Aguas Nacionales (National Waters Law) which are concerned with conservation, as well as improving management and infrastructure across the country. Management, maintenance, and the collection of the minimal service fees are conducted at the local level by the CNA's district offices known as SAPA. Puerto San Carlos has a local SAPA office in the community. The community's water supply consists of several reservoirs of groundwater that are shared with other communities located in the interior of the Baja. Study participants have stated that despite improvements to water service, extended maintenance shutdowns occur frequently and effect only select areas of the community. During the study (March 27, 2007 – April 3, 2007) in Puerto San Carlos half the community was without water for nearly one week as SAPA upgraded a portion of the delivery system. Although the water delivered by SAPA is drinkable, all study participants indicated that they drink bottled water because they prefer the taste. They indicated that the majority of the community do this because historically the water was not drinkable due to poor water quality.

As stated previously the Puerto Magdalena's water was previously delivered by the Mexican Navy. However, this service was not consistent and had a difficult time servicing the community's increasing population. Within the last decade the cooperative has become very successful enabling it to arrange a deal with the CNA for a desalination plant to service the community. The plant is owned in managed by the cooperative and ownership is split between the CNA and the cooperative. All decisions regarding water allocation, access, and pricing are made by the cooperative council. The majority of the cooperatives decisions are consensus based, with every member of the cooperative eligible to vote. The plant supplies every household with 1000L of clean water per week. Study participants indicated that despite the nearly free clean-water available from the desalination plant, many of them boat to Puerto San Carlos to purchase bottled water for drinking. Given these operating principles, Puerto Magdalena's WGS is a form of Public – Community partnership.

Approach

Exploratory Survey

The most commonly used method of evaluating trust in a society is the survey question: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" (Delhey & Newton, 2002) More comprehensive surveys, such as the European Social Survey, Euromodule, the World Values Survey (WVS), and the World Bank's Social Capital Assessment Tool (SOCAT) (Grootaert C. & van Bastelaer, 2002) have been developed and successfully used to evaluate both social and political trust and what societal conditions influence these types of trust. Earle and Cvetkovich also made use of questionnaires and discussions during the testing of their shared-values theory in the areas of risk management and forestry.

Given the success of questionnaires/surveys (Miller & Salkind, 2002; Leedy & Ormrod, 2004) to evaluate trust and societal conditions in other studies, an exploratory survey was developed to gather basic quantitative and qualitative data that would

address the study questions. Given the exploratory nature of this study, an in-depth statistical analysis was not conducted; the results cannot be generalized to the entire population in any of the study communities and are discussed strictly in the context of the study participants. The intent of this study is to provide a glimpse into the topic and use it to guide future research efforts.

Survey Objective

The survey evaluated the participant's:

- Present & past interaction with their water governance system;
- Beliefs/values about a set of societal conditions directly and indirectly related to water governance;
- Willingness to trust different types of WGS, using the individual's preference to delegate the responsibility to different provider groups;
- Knowledge of the operating principles associated with different types of WGS, and their level of trust in these systems; and,
- Preferred operating principles for their ideal WGS, and their level of trust in this WGS.

The survey simultaneously evaluated a participant's behaviours and attitudes regarding WGS preference, water availability, trust in government, and trust in industry. The survey made use of a mixture of survey tools including:

- Likert Scales (5-point ranking);
- Checklists;
- Multiple-choice questions; and,

• Short-answer questions.

Such an approach allowed for parallels to be drawn between a participant's answers and those of other participants during data analysis.

Question Design

The World Values Survey and the World Bank SOCAT tool were used to provide guidance on question design. The content of the questions was derived from the operating principles identified in Table 1. From these resources three categories of questions were developed for the survey. The complete survey is affixed in Appendix A.

Background and knowledge questions.

The purpose of these questions is to gain an understanding of the participant's personal background (e.g. occupation), knowledge regarding the different types of WGS as well as their historical experience and interactions with WGS (see Figure 4). These questions are contained within Part A and C (see Appendix A)



Figure 4. Topics addressed in the survey as questions with regards to participant background and knowledge about WGS.

Questions regarding beliefs, values, trust independent of water governance;

The purpose here is to determine participant beliefs/values regarding various societal conditions and to assess which stakeholders the participant tends to trust in everyday life (see Figure 5). These questions are dispersed within Part D and E (see Appendix A).



Figure 5. Topics addressed in the survey as questions with regards to participant general beliefs and values and trust

Questions regarding beliefs, values & trust - stakeholder specific

The purpose of these questions was to determine participant beliefs/values about specific stakeholders (see Figure 6). These questions are dispersed within Part D and E(see Appendix A).



Figure 6. Topics addressed in the survey as questions with regards to participant beliefs and values and trust specific to water issues

Survey Pre-testing

In an effort to evaluate the quality of the survey, a trial survey was administered to volunteers from the 2007 Royal Roads University, Master of Environment and Management Residency. Feedback from survey participants was used to improve the survey prior to administering it in the study locations.

As an incentive, trial survey participants who provided their e-mail address were entered to win a \$100 gift certificate to the University cafeteria. One winner was chosen at random once the survey had closed.

Location Specific Design and Delivery

Although these four communities share many common characteristics, two distinct methods were needed to deliver the survey given local conditions. This section outlines these in further detail. A copy of the survey questions are presented in Appendix A. This version was delivered as an online survey to the communities of Tofino and Ucluelet.

Canada: Online Survey

Mail surveys are known to be a less costly method to administer surveys however they tend to have low return rate hence a mixed delivery format was used. Unaddressed Ad-Mail invitations were distributed to more than 50% of the residences in Tofino and Ucluelet using Canada Post's Ad-Mail service. The invitations directed interested community members to visit a website (www.earthwatertrust.com). Those who chose to visit the website were presented with a survey waiver that they had to agree to prior to continuing on to complete the online survey (see Appendix B for ethics review). The online survey was hosted by the Royal Roads University online survey tool. In an effort to avoid multiple responses from the same individual, each invitation was given a unique alphanumeric code for the recipient to enter in the survey when prompted. The online survey was open for a period of 40 days from April 30 – June 8, 2007.

Twelve days into the online survey, a community member suggested that most people in Tofino and Ucluelet would not receive the invitation as they request that Canada Post block ad-mail and junk mail. In response to this information, 1400 newspaper inserts were issued in the Westerly News along with a news article in both the Westerly News and the Westcoaster.ca (two local print and online news services distributing to Tofino and Ucluelet).

As an incentive, survey participants who provided their e-mail were entered to win a \$150 gift certificate to a local restaurant. One winner was chosen at random from each community once the survey had closed. Community members were notified of the raffle in the invitations, newspaper inserts, and in the survey preamble/waiver. The number of invitations sent and resulting number of survey participants are

presented in Table 4.

paleu în the	online survey a		Tonno and Ocidelet.		
Study		# of		# of	
	Population		Invitations		
Location		Residences		Participants	
			500 invitations by Ad-Mail		
- <i>c</i>	4000	000	+	00	
lofino	1600	933	1400 newspaper inserts	20	
			(Westerly News)		
			600 invitations by Ad-Mail		
			+		
Ucluelet	1900	948		50	
			1400 newspaper inserts		
			(Westerly news)		
			(Westerly news)		

Table 4. The number of invitations sent and resulting number of individuals (participants) who
participated in the online survey administered in Tofino and Ucluelet.

Other Responses:

News of the survey spread online to several discussion forums. As a result, there were three (3) survey participants from outside the study locations. The three participants were from Port Alberni, a community one hour into the interior of Vancouver Island from Tofino and Ucluelet. For the purposes of this study, their responses were stored separately and not analyzed.

Mexico: Rapid Rural Appraisal Questionnaire

The World Bank SOCAT identifies the need to place surveys in the context of community activities by conducting open-ended community interviews in the form of Rapid Rural Appraisals (RRA). This is an externally driven process that makes use of

mapping exercises, open-ended discussions, and questionnaires (Rennie & Singh, 1995) about social trust in the context of the topic (in this case WGS). These approaches have been used extensively with much success by many social trust/capital researchers (Grootaert & van Bastelaer, 2002; World Bank, 2002; Delhey & Newton, 2002; Casterlfranchi & Falcone, 2001, Govier, 1997).

This study made use of RRA methods for the fieldwork conducted in Puerto San Carlos and Puerto Magdalena. These methods enabled the survey to be adapted for delivery as an interview, but it also meant that several questions could not be asked. Many of the RRA activities require group meetings, however many members of the two Mexican communities did not feel comfortable meeting in a group scenario to discuss the content of the survey. Consequently, group interviews were held with community members who were willing to meet in groups, along with several individual interviews with those who chose not to meet in a group setting.

The RRA consisted of the following activities:

- Two group meetings (one with 4 male participants, the other 4 female participants) in Puerto San Carlos conducted at the School for Field Studies Center for Coastal Studies (SFS); and
- 16 individual dialogues with community members of Puerto San Carlos and Puerto Magdalena using a modified version of the questionnaire as a framework.

With the assistance of the SFS, purposive sampling was used to select community members with differing backgrounds (i.e. entrepreneurs, fisherman, tourism

operators etc.), thereby increasing the potential of gathering the most diverse perspectives. Dialogues were impromptu, held at the participants place of work, residence, or in the town center park. Two group dialogues conducted (four people per dialogue group) in Puerto San Carlos were pre-scheduled at SFS. These were meant to initiate a deeper conversation with community members on the community and water.

All dialogues and group sessions were conducted in Spanish. A translator from SFS, familiar with Puerto San Carlos and Puerto Magdalena, took part in all dialogues in the event that clarification was required. Before commencing with the dialogues, the translator was briefed in detail about the content of the questionnaire and assisted in the translation of the questionnaire into Spanish.

Community members asked to participate in a dialogue or a group session were given a brief description of the dialogue topic (in Spanish) prior to participating. They were not compelled to participate; they were informed that if they chose to participate, they were free to withdraw at any time without prejudice. Their agreement to participate demonstrated informed consent. No minors were involved in the dialogues. In appreciation for their time, community members who participated in a dialogue were given Canadian memorabilia (key chains and pins) not exceeding \$2.00CDN. The complete ethics approved by Royal Roads University is provided in Appendix B.

Puerto San Carlos

The RRA took place from March 27, 2007 to April 3, 2007. Dialogues were conducted with 16 community members (four male and eight female) representing a variety of professions. The dialogues lasted from 30 minutes to more than one hour depending on the participants' schedule and level of interest in the study. Four of these
dialogues were conducted in a group setting with two to four individuals. Two dialogues were conducted at the field school.

Puerto Magdalena

The RRA took place April 1, 2007. Dialogues were conducted with 6 community members (two male and four female) representing a variety of professions within the community. The dialogues lasted from 30 minutes to more than one hour depending on the participants' schedule and level of interest in the study. These dialogues were impromptu and conducted in groups as community members felt uncomfortable with individual dialogues.

Data Analysis Methods

Given the exploratory nature of this study, an in-depth statistical analysis was not conducted; the results cannot be generalized to the entire population in any of the study communities and are discussed strictly in the context of the study participants. Instead, several data analysis methods were used to explore the study questions given the format of the data collected. The following sections provide a brief outline of the data analysis methods used. For a detailed description of the data analysis methods used for each study location refer to Appendix C.

Since two data collection methods were used, the data collected from the exploration was analysed in two ways.

Online Survey Tofino and Ucluelet

The results of the online survey were part of the quantitative exploration of the primary study question and the qualitative exploration of the two secondary study questions. Once the survey closed all the data was downloaded from the Royal Roads Survey tool site as an MS Excel file. All data tabulation and analysis was conducted using MS Excel. Descriptive statistics were tabulated and the responses summarized by community. When appropriate the categorical answers from Part A, D, and E were collapsed to facilitate more meaningful data analysis. Contingency tables were developed using MS Access. These tables were used to identify whether a participant's response to a question could be an indicator of their response to another question. This approach was key to addressing the primary research question.

Rapid Rural Appraisal Puerto Magdalena and Puerto San Carlos

The information gathered during the interviews in Puerto San Carlos and Puerto Magdalena were part of the qualitative exploration of the two secondary study questions. Since participant responses were collected through interviews guided by a variation of the online survey; no quantitative data was obtained. Content analysis of participant responses was limited to summarizing the written answers by location to determine the degree of similarity in the answers provided by participants during the interviews.

Participant Bias

Every effort was made to limit bias in this exploratory study especially with regards to participants. As with any contentious topic, a select group of individuals show a high level of interest. Part of the purpose for a large incentive being offered to participants of the online study was to coax community members who typically would not participate in such a survey to participate. It's impossible to determine whether online survey participants were only those individuals who were very interested in the topic.

Case Study Findings

As noted earlier, paradigm shifts are increasingly recognized as requirements to initiating change in stakeholders and their decision-making. In theory, approaching water resource governance through beliefs and values is part of a paradigm shift required by decision-making bodies to provide sustainable, accessible, affordable clean drinking water supplies: in essence ensuring the human right to water. The case studies sought to identify whether potential exists to use a beliefs and values based approach to water governance in practice. Three questions were identified for practical study as part of the empirical exploration of whether the public's general beliefs and values, general location, and level of water scarcity had any impact on their preference for specific WGS operating principles, and does so with reference to primary and secondary study questions stated previously.

Exploring beliefs and values as an indicator of trust

Primary Research Question:

• Can consumer beliefs and values about societal conditions be used as an indicator of the type of WGS that the consumer would trust?

Exploratory Findings:

- Step 1: Participant beliefs and values were found to be a reasonable indicator of the operating principles they wanted as part of their 'Ideal/Preferred' WGS;
- Step 2: Participant trust in a WGS was found to increase with the degree of similarity between its operating principles and those participants selected for their 'Ideal/Preferred' WGS.

Conclusion:

 Evidence suggests that consumer beliefs and values about societal conditions can be used as an indicator of the type of WGS that a consumer would trust.

Developing a planning tool to incorporate consumer beliefs and values into water resource governance means determining whether these beliefs and values could act as an indicator of the consumer's willingness to trust a WGS. As presented earlier this relationship appears to exist in theory.

This question was addressed using the quantitative data collected as part of the online survey conducted in Tofino and Ucluelet. Participant responses from Mexico were strictly qualitative and therefore could not used to address this question.

There are two steps to determine if consumer beliefs and values can be used as an indicator of the WGS that consumers would trust. The first step was to identify if consumer beliefs/values about societal characteristics play a role in their choice of operating principles. The second step was to determine if consumer trust increases when the operating principles (essentially its institutional beliefs and values) of a WGS match their own values.

As outlined in the methodologies section, participants were asked to answer questions that evaluated several beliefs and values (Part D and E of the online survey). These questions were derived from selected sets of beliefs and values that could be considered to influence decisions regarding water.

In order to apply citizens' general beliefs and values with respect to a specific topic like water governance, there is a need know if and how they would translate into operating principles of a WGS. To address this issue, participants were also asked to choose the operating principles they wanted included in a WGS for their water service area (Part B1a of the online survey, Appendix A). This will be referred to as the participants' 'Ideal' WGS. The list of operating principles (see Part B1a of the online survey, Appendix A) presented in consisted of set of 20 basic operating principles of water governance systems derived from Table 1 (see p. 28).

Once participants had selected the operating principles for their Ideal WGS, they were asked to rank their level of trust in this system. Participants were then given the same list of operating principles and, given their knowledge of these systems, they were asked to identify which operating principles they believed to be associated with market, public, and community water governance systems. They were also asked to rank their level of trust in the three systems. This made it possible to gain an understanding of how knowledgeable participants were about the different types of WGS and their level of trust in those systems given their understanding of the systems.

Findings

Table 5 (refer to the following page) presents the WGS operating principles included in the study and the percentage of participants who chose each operating principle for their Ideal WGS. The majority of participants chose similar operating principals for their Ideal WGS. These included: long-term planning in the interests of consumers, a high degree of transparency, accountability, the inclusion of local needs, traditional knowledge and expert opinion in decision-making.

Table 5. Results of the online survey summarizing which operating principles participants associated with each type of water governance system. The data is presented as the number of participants that chose an operating principle and the corresponding water governance system they selected.

% of Participant Choices by type of WGS			e of WGS	WGS Operating Principles	
Ideal	Community	Public	Market	· · · · ·	
87%	93%	6%	17%	The reasons for decisions and actions ARE available to consumers	
73%	88%	9%	12%	Local needs & traditional knowledge guide decision making	
77%	57%	1%	58%	Expert opinions guide decision making	
6%	7%	0%	90%	water is viewed as a commodity (decisions motivated by profits)	
1%	10%	0%	87%	Decisions are made in the best interest of the service provider	
57%	57%	6%	3%	Water is viewed as a human-right (no profit made or consumers not charged for use)	
24%	4%	1%	9%	The water resource is owned by the government	
3%	6%	3%	84%	The water resource is owned by the service provider	
63%	81%	13%	1%	The water resource is owned by community-members	
43%	68%	4%	4%	Decisions are made by Consumers	
49%	12%	9%	9%	Decisions are made by elected decision-makers and bureaucrats	
1%	4%	6%	88%	Decisions are made by managers of a corporation	
3%	0%	4%	80%	No Consumer involvement in decision-making	
73%	80%	7%	4%	Decisions are made in the best interest of the consumer	
11%	12%	3%	83%	Decision-makers are accountable to shareholders	
86%	77%	3%	9%	Decision-makers are accountable to consumers	
3%	1%	6%	74%	The reason for decisions and actions are NOT available to Consumers	
73%	68%	7%	10%	Decisions balance economic, social, and environmental interests	
93%	83%	4%	28%	Long-term Planning	
26%	42%	7%	68%	Short-term planning	

The majority of participants were able to correctly distinguish between the different types of generic WGS, selecting mostly those operating principles that are generally associated with each type of WGS.

Notable differences exist between participants' Ideal WGS and their definition of Public and Market systems. Differences were present in such areas as: transparency, inclusion of local needs and traditional knowledge in decision-making, the treatment of water as a commodity, accountability to consumers, the human-right to water, and the degree of consumer involvement in decision-making. Also, the operating principles chosen by participants for their Ideal WGS were nearly all very similar to those they associated with a Community WGS. The most notable differences were to do with the division of decision-making power among elected decision-makers and bureaucrats, experts, and consumers and with regards to resource ownership (e.g. consumers vs. government vs. service provider). While a Community system typically involves a wateruser group (i.e. a cooperative whose membership includes all local consumers) that makes decisions and own the resource, participants were divided over who should be responsible for decision-making (consumers vs. bureaucrats and elected officials) in their Ideal WGS, as well as who should own the resource (consumers vs. government). Interestingly both Tofino and Ucluelet have what could be classified as a type of Public WGS (e.g. publicly managed utility system) but survey participants appear to prefer a WGS that more closely resembles a hybrid of Community and Public systems.

Step 1: Translating Beliefs and Values into Operating Principles

This section reports on preliminary empirical evidence about whether or not beliefs/values can be used as an indicator of the WGS operating principles a consumer

would choose. The information collected through the online study made it possible to look for a relationship between participant beliefs/values and their choice of operating principles for their Ideal WGS¹⁵. The following table summarizes the relationship found between the categories of beliefs/values and all the WGS operating principles. The results are presented as a percentage and are read as: on average, 75% of all survey participants who answered the same way to beliefs and values questions relating to Economics vs. Environment also chose the same set of WGS operating principles. The survey allowed participants to select and not to select the operating principles for their Ideal WGS. Those operating principles not selected by participants were regarded as a choice, just as those they did select, and were evaluated as part of this exploratory study. This makes it possible to evaluate the relationship between participant beliefs and values with those operating principles participants wanted and did not want as part of their Ideal WGS.

Only those categories of beliefs and values questions with a relationship of 60% or greater with an operating principle are summarized in Table 6. The average percent relationship was calculated for these questions as well as the minimum and maximum values. Appendix D presents a complete listing of all relationships found between the categories of participant beliefs and values (Part A, D & E) and their selection of WGS operating principles (Part B).

¹⁵ This was determined through the use of simple contingency tables as described in the practical exploration methodologies p 56...

Table 6. Relationship between the categories of beliefs a	nd values selected by participants and the
operating principles they selected for their 'Ideal' WGS.	
	Polationship to Ideal

		Relation	nsnip to	Ideal
Categories of Beliefs/Values	Questions	WGS Operating Principles		
		Average	Min	Max
Stakeholder Metivations & Intentions	D5, D33,D35,	770/	610/	07%
	E2, E10, E11	11/0	0170	9770
General & water specific decision-making	D8, D9, E1	77%	61%	95%
Economics vs. Environment	D12, D15, D29	75%	60%	90%
Importance of Water to the Community	F3 F8	73%	61%	80%
and the Individual	20, 20	1070	0170	0070
Orientation to water	D6, D19, D36	72%	61%	84%
Water Property Rights	D10, D30	71%	60%	81%
Stakeholder involvement in community	D21,D24, D25,			
	D38	68%	60%	84%
Traditional knowledge and customs	D11	69%	60%	74%
General property rights	D3, D7b	68%	60%	76%
Rule of Law	D2, D13, D20	66%	60%	73%

This study did not address an exact quantitative causal relationship between participant beliefs and values and the operating principles they chose. Nevertheless, when considered in concert with Senge's Ladder of Inference (Senge, 1990), the results presented in Table 6 provide preliminary evidence of a relationship between the beliefs and values of participants and the operating principles they chose for their Ideal WGS. The degree of relationship between consumer beliefs and values and their selection of operating principles vary from an average of 66% to 77% with a maximum relationship of 97%. Of the beliefs and values explored in this study, those concerned with decisionmaking, stakeholder motivations and intentions, and economics vs. environment appear to have the closest relationship with operating principles participants selected. Many of the beliefs and values in these categories were found to have a strong relationship (90% - 97%) with the set of operating principles that the participants chose.

Table 6 also demonstrates that no one belief and value category was found to have a perfect relationship with participants' choices of operating principles. This suggests that sets of these categories rather than one specific category may be linked to how participants choose operating principles.

Three of the 20 operating principles assessed during the study did not have a relationship with participant beliefs and values greater than 60%. These operating principles include:

- Water is viewed as a human-right (no profit made or consumers not charged for use);
- 2. Decisions are made by consumers;
- 3. Decisions are made by elected decision-makers and bureaucrats.

It is also possible that these operating principles are among those that can only be explained by the interaction of a variety of beliefs and values.

So far this exploratory study has found preliminary evidence indicating that a relationship exists between the beliefs and values held by consumers and the WGS operating principles they would choose for their Ideal WGS.

Step 2: Identify Consumer Trust Levels

The Table 7 summarizes participant trust levels for the various types of WGS including the participants' Ideal system. The Ideal WGS chosen by participants has the highest percentage of participants who trust it (60%) compared to their level of trust in the other systems. This was expected since the previous section concluded that the Ideal WGS selected by participants was found to mirror many of their beliefs and values.

	Type of Water Governance System			m
Level of Participant	(1-11)	0	Dublic	NA - ulu - 4
Trust in a WGS	Ideal	Community	Public	Market
	(PartB.1b)	(Part C.1b)	(Part C.2b)	(Part C.3b)
Trust	60%	57%	39%	12%
Undecided	30%	35%	35%	18%
Do not trust	10%	9%	26%	71%
Total	100%	100%	100%	100%

Table 7. Comparison of participant trust in each water governance system

This conclusion is further supported by Cvetkovich and Earle's theory that shared-values evoke trust since both WGS have operating principles that parallel the beliefs and values of the participants. Meanwhile, the operating principles that participants associated with the Public and Market systems did not share their beliefs and values so these systems were less trusted.

Conclusions

The results of this empirical exploratory study suggest that theory holds in practice: it is possible for consumer beliefs and values about societal characteristics to act as an indicator of the type of WGS consumers would trust. These exploratory results provide evidence that it is possible to have a planning tool that evaluates consumer beliefs and values to determine their Ideal WGS and therefore their most trusted WGS. Further details about how this tool could work, its practical applications, and the further research that may be required to solidify it are included in Part 3 of this study.

Exploring the differences between communities

Secondary Research Questions:

- Do differences in beliefs, values, and the level of trust in water governance systems exist between adjacent communities where one community has a surplus of water and the other has a shortage of water?
- Do differences in beliefs, values, and the level of trust in water governance systems exist between communities in developed and developing countries (e.g. Canada v. Mexico)?

Exploratory Findings:

• The beliefs, values, and the level of trust of adjacent communities with varying quantities of water resources appeared to vary little.

• The beliefs, values, and the level of trust of communities in countries with varying levels of development appeared to vary little.

Conclusion:

• This part of the practical exploration remains somewhat inconclusive. There exists the possibility that beliefs and values vary with *local* societal conditions instead of with the country's level of development.

Several conditions (socioeconomic or environmental) may exist that create a set of beliefs and values unique to a particular community. It is this uniqueness that I hope to capture with a planning tool such as the one discussed above, and in doing so create WGS and conservation policy targeted to interact with consumer beliefs and values at the community level.

The secondary research questions provide an opportunity take a more detailed look at two societal conditions (both socioeconomic and environmental) that may result in consumers having a different set of beliefs and values, driving them to trust a WGS with different operating principles. These two conditions included:

- Water drought vs. Water surplus
- Developed world vs. Developing world.

As outlined in the methodologies section (see p 51), the study communities were selected in part because they exhibit the two conditions we wish to explore. Table 8 identifies which study communities were compared to address the two societal conditions being explored.

Societal Conditions	Study Community A	Study Community B
Water drought vs.	Tofino	Ucluelet
Water surplus	Puerto San Carlos	Puerto Magdalena
Developed vs.	Mexican Communities	Canadian Communities
Developing World		

Societal Conditions Study Community A Study Community	Table 8. This table identifies the study communities used to address each study question.				
	Societal Conditions	Study Community A	Study Community B		

What follows is a comparative exploration of the similarities and differences in participant beliefs and values and their preferred and trusted WGS in the context of the societal conditions outlined above.

Societal Condition 1: Water surplus vs. Water Shortage

The objective of this secondary research question was to explore the selection of existence of any differences in beliefs and values that may be present between two neighbouring communities where one community has suffered a drought and the other has not.

Canada: Ucluelet vs. Tofino

In 2006, the tourist town of Tofino suffered a major drought which has been linked to adverse weather conditions, high consumption, and inadequate infrastructure. The community of Ucluelet, located approximately 40km from Tofino, is the nearest neighbour to Tofino. That same year Ucluelet did not suffer a drought; in fact, it had sufficient water supply to assist Tofino during its drought. Water from Ucluelet was trucked to Tofino daily. The impact of Tofino's water shortage and Ucluelet's water

surplus is reflected in their participants' responses to how reliable they believe their community's water supply is. Tofino participants were somewhat negative in this regard with 45% of participants believing their water supply is not reliable and 20% remaining unsure. Conversely, 62% of Ucluelet participants' believe their community's water supply is reliable and while only 14% were unsure.

The expected result of decreased consumer confidence in their water supply would be a heightened awareness of how necessary conservation relative to consumers who are confident about their supply. This was not the case in Tofino vs. Ucluelet. Tofino participants were only slightly more concerned with conservation and sustainability compared to their Ucluelet counterparts. A possible reason for this may be that Ucluelet participants learned from Tofino's drought and understand the importance of conservation and sustainability.

Although their beliefs about conservation and sustainable development were somewhat similar, the beliefs held by Tofino participants about water resource ownership and cost were notably different from those of Ucluelet participants. Tofino participants were divided in their beliefs about free drinking-water, with 40% neither agreeing nor disagreeing, 25% in agreement, and 35% in disagreement. Conversely, 54% of Ucluelet participants agreed that drinking-water should be free, 30% disagreed, and 14%. On being given exclusive rights to a water resource, 95% Tofino participants strongly disagreed, while 76% of Ucluelet participants disagreed. Participants from these communities also had different beliefs and values on topics such as the effectiveness and fairness of the legal system, which group (i.e. local government, community group, national government, international corporations, or local government) should make decisions about water management, and the capability of these groups to manage water resources.

Participants from Tofino and Ucluelet agreed on many of the same operating principles for a WGS except for: "local needs & traditional knowledge guide decision making" and "decisions are made by consumers." In both cases more Tofino participants than Ucluelet participants selected these operating principles (18% more and 30% more respectively). As noted during the discussion of the primary research question, no relationship was found between these two operating principles and any of the participant beliefs and values. This means that the differences of beliefs and values between Tofino and Ucluelet do not explain the differences in their choice operating principles.

It is plausible that the selection of these operating principles by Tofino participants is a product of the drought. If members of the community felt that their water service had been mismanaged they may believe the solution would be for a WGS to take into account local needs (the needs of the tourism industry) and that this can be accomplished by an increased level of decision-making by consumers.

Mexico: Puerto San Carlos vs. Puerto Magdalena

The location of Puerto San Carlos (PSC) and the water service infrastructure make it at risk to frequent water shortages and unexpected service interruptions. During the field study in, an unexpected service interruption left over half of the community without water for over a week. Meanwhile, 30km south of PSC is the community of Puerto Magdalena. This community is equipped with its own desalination system that provides a reliable source of water in comparison to PSC. Participants from PSC and Puerto Magdalena had very similar beliefs and values, with few notable differences. The consensus among participants from PSC is that people must pay for the water they used in addition to the cost of maintaining the system infrastructure. They believe that if this does not occur consumers will never have a reason to conserve water. Whereas, participants from Puerto Magdalena believed that any cost associated with water should be limited to paying for the service and not the resource itself. Since the members of the cooperative community of Puerto Magdalena are all given an equal volume of water to use (approximately 1000L) for a week, its possible that their difference in belief with PSC participants is because the members of the cooperative must survive on a limited quantity of water a week. Purchasing more water from the Puerto Magdalena cooperative is not possible so a monetary incentive to conserve water would not be expected to influence water consumption by these participants.

The participants of Puerto Magdalena believed that people of political power would not try to take advantage of them, whereas nearly all participants from PSC did not feel this way. This may be the result of what the participants from Puerto Magdalena described as a good relationship with the government since the national government partnered with them to purchase their desalination plant and the local government members in the community are also members of the cooperative. This was not the case in PSC as many of the participants felt the local government was corrupt due to their alliances with some of the more profitable cooperatives in town.

The remaining notable differences in the beliefs and values of PSC participants and Puerto Magdalena participants are how they view cooperatives. In Puerto Magdalena conflict is limited to disputes among members of the cooperative. The participants from this community place all their trust in the cooperative. Conversely, the participants from PSC voiced their discontent with the cooperatives of PSC believing them to be self-righteous and corrupt, and preferring to see more private companies than cooperatives in the future. The reasons for this emerged in the findings on the participants' preferred type of WGS, which was similar with two key differences. The participants from PSC wanted a WGS that could enforce users to pay on a volume of water used basis, while participants from Puerto Magdalena were content to pay for service only. This difference would appear to be the result of the current state of water service infrastructure currently in place in both communities which has resulted in PSC having a less reliable system as opposed to Puerto Magdalena. Participants from Puerto Magdalena wanted their cooperative to act as service provider, whereas PSC participants trusted the cooperatives less than they trusted the local government so they preferred to have local government act as service provider. It is more likely this is a result of participant beliefs about cooperatives and the local government.

In summary, the further exploration of societal condition 1 (water shortage vs. water surplus) yielded little evidence to suggest that differences in consumer beliefs & values arise in communities or water service areas with a water shortage vs. a water surplus. It also appears that any differences between water service areas with respect to consumer choice of WGS operating principles may not be the result of the reliability of the system or the quantity of water available.

Societal Condition 2: Developed vs. Developing World

The distinction between developed and developing countries is a topic of intense debate specifically in the realm of development and environment. As discussed earlier (p.20), the debate has consistently centered on the success of policies from developed countries that are implemented in developing countries. Stiglitz recognized that the success of these policies was limited because the appropriate preconditions were not present. These preconditions are essentially the societal conditions, beliefs, and values necessary to promote the acceptance of policies by the general public and socioeconomic system.

The study communities were chosen for a variety of reasons. One of those reasons was because of their similarities and differences. All four communities are rural and located in coastal in environments capable of extreme variations. They also share similar economies: Tofino and Puerto San Carlos have strong tourism industries as well as fishing industries while Ucluelet¹⁶ and Puerto Magdalena have an economic base which includes fishing. Both Mexico and Canada are democratic countries with an established market economic system.

The study communities also have differences. While they are all rural communities to some extent, the Puerto Magdalena is only accessible by boat. Community members are dependent on the fish they catch and the supplies they purchase in Puerto San Carlos. Puerto Magdalena is also a closed-membership cooperative fishing community. Meanwhile, Puerto San Carlos has a reported 50 – 100

¹⁶ Ucluelet also has a growing industry in tourism and logging.

independent fishing cooperatives. Unlike the Canadian communities, these cooperatives are key institutions in the Mexican study communities.

The intent of this secondary study question is to explore the general beliefs and values of participants in the context of the similarities and differences among the four communities and how these have affected any preference participants may have shown for a specific WGS. The following explores some of the noteworthy similarities and differences in beliefs and values held by participants in these communities and their preferred WGS.

Similarities in Beliefs and Values;

The study participants from Canada and Mexico were found to share many of the same beliefs and values despite the level of development of their respective countries. In all four communities, the majority of participants (>80%) felt that resources should be used to some extent for economic gains, but that water should not be bought and sold as any other form of commodity. A similar percentage of participants believed that a balance should be struck between environmental protection and economic growth. Participants also agreed that although water is a shared heritage and a human right, access to water cannot be unlimited or it will be abused.

Many of their beliefs about societal conditions were also similar. Most participants believed in the virtue of self-reliance and personal independence; however, they also recognized that community members should support one another, the state should provide for its citizens to some extent, and that greater equality should exist in terms of resources and money. Most participants felt that national government and corporations did not share their beliefs and values. Nearly 50% of participants felt local government shared their beliefs and values while the majority of the remaining participants neither agreed nor disagreed with the statement. Similarly, the majority of participants felt only local government and community groups were the most likely to act in the best interests of the public. Most participants also believed in a high level of transparency, increased involvement of community members in decision-making and the use of Traditional Environmental Knowledge (TEK) to guide to decision-making. A final notable similarity was that nearly all participants said they typically drink bottled-water instead of tapwater.

Differences in Beliefs and Values

Few differences existed between the beliefs and values of Canadian and Mexican participants. Among these differences was the belief regarding paying for water. Most Mexican participants felt that it was extremely important for consumers to pay not only for system maintenance but also for the water they used because that was the only way to guarantee consumers conserved water. On this topic Canadian participants were divided, with nearly 50% of participants believing that drinking-water should be free and the rest believing it should not be free or neither agreeing nor disagreeing with the statement.

A notable difference in beliefs that was present among participants was their responses to whether the needs of local inhabitants should be favoured over the needs of foreigners. Nearly all participants from Puerto San Carlos recognized their dependency on foreigners and therefore the need to balance the needs of both groups.

However, >70% of study participants from Puerto Magdalena, Ucluelet and the tourist hub of Tofino believed the needs of local inhabitants should take priority. While this is not a distinct difference between the responses of Mexican and Canadian participants, it does provide insight into how the study participants from these rural communities visualize their relationship and division of resources with visitors

Another noteworthy difference centred on the participants beliefs regarding who should make decisions about water management. All participants felt that decisions about water management should be left in the hands of a local institution that is not a company, however, they remained divided between local government vs. a community group. Despite the numerous cooperative organizations in Puerto San Carlos, all participants from this community felt that the cooperatives were elitist, corrupted, and primarily interested in benefiting their members rather than the community as a whole. When asked which group should make decisions regarding about water management, all participants felt the best choice was local government since a community group (user group or cooperative) would undoubtedly become corrupted. Meanwhile, the participants from Puerto Magdalena believed a water cooperative or user group would be the most suitable service provider (their current service provider). Participants from Tofino and Ucluelet were also divided over which group would be the best.

Preference of WGS

Developed and developing countries differ economically, socially, and environmentally; however, based on the assessed beliefs and values of study participants, there is evidence that the citizens of these study countries may have much in common. If we conclude that personal beliefs and values can be used as an indicator of the type of WGS individuals would trust, the findings would indicate that the vast majority of participants from each community would trust a form of Community-Public hybrid system with either a community group or the local government as primary service provider. This conclusion is further supported by the participants indicating in their responses that their preferred WGS would have the following operating principles:

- A high level of transparency, accountability, and consumer involvement.
- Be managed by a community or local public institution supported by experts and traditional knowledge.
- Make sustainable decisions.
- Keep the ownership of the resource with community members or the local government.

In summary, the beliefs and values held by study participants from the study communities located in developed and developing countries are very similar as is their preference of WGS system. This then begs the question: if people in developed and developing countries share similar beliefs and values, why has there been minimal success applying the WGS models of developed countries to developing countries?

The answer is that the findings of this study may not be the result of people in developed countries having the same beliefs and values as those in developing countries. Rather, these findings more likely provide evidence that consumers in different water service areas (or communities) with similar societal conditions (e.g. a small rural town with a sense of community located in an extreme environment with similar local economies and economic/social institutions) have similar beliefs and

values, regardless of their level of development. As such, the consumers of these water service areas prefer and would trust similar WGS. This conclusion is consistent with the degree of incompatibility that has resulted when a successful WGS used in one water service area has been applied to service area with a different set of societal conditions as demonstrated by the examples previously presented from Bolivia, U.S.A, and Africa.

PART 3: APPLICATION

Recap

This theoretical and practical exploration has introduced and demonstrated the relationship between successful water governance systems (i.e. those which attract public support and respect for conservation measures, a productive decision-making environment, and responsible management) and consumer beliefs and values. Figure 3 presents a model of this relationship, starting with water governance based on the beliefs and values of consumers, through to the achievement of the human right to water. In conclusion, successful water governance systems:

- a. Reflect belief and values.
- b. Are trust-based.
- c. Involve public participation in stakeholder dialogues.
- d. Are designed with local societal conditions and environmental conditions.
- e. Achieve the human right to water.

A common thread is the role public participation plays in defining and achieving the intended outcomes of water governance. Public participation relies on consumer trust in other stakeholders as well as their water governance system. Stakeholders pursuing sustainable water management need to look beyond what conservation methods they can use to optimize their mechanized water delivery systems. These initiatives are at risk of failure without the trust and support of consumers. As outlined earlier (p.41), if decision-makers design WGS that try to maximize consumer trust they will be:

- Enabling public participation;
- Promoting consumer cooperation and compliance; and,
- Attracting responsibility and accountability.

In this way decision makers can create the proper environment for the intended results of sustainable water management policies (United Nations, 2003).

With this in mind, how can decision-makers take proactive steps towards water governance systems designed for success? The following section offers a means for success in the form of a planning tool built on the findings of this study.

A Consumer Beliefs and Values-Based Water Governance System Design Tool

Public policy decision advisors and decision-makers use surveys, questionnaires, or checklists to help them to evaluate policy options prior to implementation. They use these tools to provide information that can be critical during the developmental (and even later) stage(s) of any policy or planning project, giving them needed insight into the topic and creating the foundation for a dialogue with other stakeholders. When dealing with a complex topic that can be difficult to assess directly, they often rely on indicators to assess the topic and provide them with invaluable information.

This study demonstrated that consumer beliefs and values can be used as indicators of what WGS consumers would trust, making it possible to evaluate options in the design of a WGS (see Figure 8). This section provides a non-technical outline of such a tool, when to use it and a stakeholder breakdown of its application and benefits of using the tool.



Figure 8. The location where a belief and value-based tool would be used to facilitate dialogue between stakeholders and guide the design of water governance systems within a beliefs and values-based approach to water governance.

Goal

Those involved in establishing a new or improving an existing WGS

(stakeholders) would be able to determine the operating principles that WGS consumers

would likely trust.

Using the Tool

A consumer survey would be used to determine the beliefs and values of the consumers within the water service area. Responses would then be correlated to the WGS operating principles that correspond to these beliefs and values. Belief and value-based principles would be selected to design a trusted WGS.

Survey Design

Categories of beliefs and values to be determined and assessed in relation to WGS operating principle options include:

- Stakeholder Motivations & Intentions
- General & Water Specific Decision-Making
- Economics vs. Environment
- Importance of Water to the Community and the Individual
- Orientation to Water Property Rights
- Stakeholder Involvement in the Community
- Traditional Knowledge and Customs
- General Property Rights
- Rule of Law

Administering the consumer beliefs and values survey

The consumer survey should be designed, administered, and interpreted to minimize bias as was done in this thesis. An effective communication and/or incentive

strategy should be used to encourage as much community involvement in the survey as possible. The delivery method of the survey should also reflect the local conditions (e.g. access to the internet, literacy, willingness to partake in open discussion).

Translating participant responses

As demonstrated by this study, consumer's responses to the survey questions (their beliefs and values) can be matched to specific operating principles, yielding a set of preferred operating principles as the framework for a WGS that the average consumer in the water service area would trust.

As an example of how this tool would work, consider the statement 'International corporations share my beliefs and values. This statement belongs to a set of probing statements in the category of consumer beliefs and values concerned with stakeholder intentions and motivations. It was found that the greater majority (>80%) of consumers disagreed with this statement. These consumers also disagreed with their water resources being owned by their service provider (a WGS operating principle), indicating a strong relationship between the consumer response to the statement and their acceptance of this operating principle. Once the consumer survey responses to this statement have been tabulated these would be 'translated'. Responses which disagree with the statement would be considered votes against this operating principle. Such translations would continue for the remainder of the consumer survey responses, providing a set of operating principles that together would create an 'Ideal WGS' from the perspective of consumers.

Since most operating principles coincide with different types of WGS (, public, community, market) the tool can classify the consumers' Ideal WGS as one of the generic WGS or as a hybrid system. This would involve using a point or ranking system to evaluate how closely the consumers' Ideal WGS resembles one of the generic WGS or a hybrid system. Each operating principle would be assigned a point¹⁷ (e.g. +1, +0.5, 0, -0.5, and -1) based on the type of WGS it is typically associated with. The scale would be centered at the public governance system, as private and community systems have more in common with the public system than they do with one another. For instance, the operating principles associated with a *community* governance system could be assigned a +1; a public governance system operating principles a 0; and a market governance system operating principles -1. Operating principles that are shared between two of the three generic systems would be given a 0.5 (shared between Community and Public) or a -0.5 (shared between Public and Market). The total number of points would be tallied for the consumers' Ideal WGS. This total score would place the Ideal WGS along the water governance system line (see Figure 9). The closer the total is to those of each of the generic WGS the closer the Ideal WGS resembles that generic WGS. Scores that place the Ideal WGS between the generic systems would classify the Ideal WGS as a type of hybrid system.

As an example, the average consumer response to a survey may indicate that their Ideal WGS consists of four operating principles associate with a community governance system (+4), two that are shared by a community and public system (+1),

¹⁷ The use of positive and negative numbers as points is to facilitate the use of a sliding scale. The assignment of a positive or negative number to a WGS is not be meant to reflect any bias whatsoever.

two from a public system (0), and two from a market system (-1). The total score for this Ideal WGS would be +4 (out of a possible + 10 or – 10 points), indicating that consumers would prefer a WGS that is a hybrid of a community and public system (see Figure 9). This would cue stakeholders and decision-makers that in order to create an effective WGS that maximizes consumer trust they should consider public-community hybrid or public system as these would more closely parallel the beliefs and values of most consumers. In this scenario they would not want to use a WGS that closely resembles a community system or a hybrid public-market system as these would not reflect the majority of consumer values and beliefs.



Figure 9. The example of an Ideal WGS as situated along the WGS line using a ranking system and the results of the beliefs and value-based survey. Since the Ideal WGS ranked less than partway between a community and public system, maximum levels of consumer trust would be found in WGS that more closely resembled a hybrid community-public or public system.

Uses and benefits for Stakeholders

Stakeholders in water governance all share common reasons for needing and wanting to exercise the full potential of consumer trust. The need to gain public buy-in on conservation policy, increase public participation, and instil responsibility and accountability in water governance has never been stronger. This tool provides stakeholders with a means for maximizing consumer trust while realizing a sustainable water management, good governance, and the human right to water and selfdetermination.

As noted, this tool can be used for both new and existing WGS. For a new system, it could be used for pre-assessment, initial design, or negotiation of a new water governance system. It brings the voice of the general public to the dialogue that goes on between planners, policy makers, and other stakeholders, providing them with the guidance they need to design successful water governance systems. For an existing system, it gives stakeholders the opportunity to identify and resolve gaps in the operating principles that, if resolved, would improve consumer buy-in on public policy. Stakeholder specific uses and benefits to using the tool are provided in more detail below.

Government & policy makers

Governments rely on public participation and public trust. Local governments already use community beliefs and values to guide the development of Official Community Plans. The tool presented here gives local government the means to identify and use local beliefs and values to guide the planning and reform of WGS. If a local government is seeking to improve the performance of water conservation policies, it might use the tool to evaluate any gaps or misalignments between the existing operating principles and those that local consumers trust. Once these gaps have been located, it may be possible to reform the WGS to enhance consumer support for conservation policies. If the WGS reforms are too extreme, planners could use this new insight into the beliefs and values of the public to tailor conservation policies that appeal to them.

In some countries the national government may have national water conservation or other policy agendas concerned with water. This may be the case depending on how the state has decided to meet its commitments to realizing the UN Millennium Development Goals specifically the sustainability and water targets. This governance design tool could be used in a similar manner as it is at the local level, except the scale of the consumer survey would increase to capture a representative sample of the country's population.

There is also the possibility of using this tool to improve basin or transboundary water governance. As identified earlier (see p.86), it's possible that beliefs and values vary between communities with different societal conditions. The tool can be used to guide the development of conservation policies for different communities within a basin located entirely within a state, or one involving two or more states and requiring transboundary governance systems..

Private Industry

"We need business to give practical meaning and reach to the values and principles that connect cultures and people everywhere"

Ban KI-moon - Secretary-General of the United Nations (United Nations Global Compact, 2007)

When private industries become involved in water governance they are presented with a special set of opportunities and issues. Corporate social responsibility (CSR) is the concept whereby companies consider the interests of society by taking responsibility for the impact of their actions on their customers and the communities and environments within which they operate. Support is growing for a CSR approach to business as companies are realizing social, environmental, and financial benefits from adhering to such practices.

To assist corporations who are committed to CSR, the UN Global Compact provides a framework for businesses that align their operations and strategies (core corporate values) with ten universally accepted principles. These principles are concerned with the realization of human rights, labour standards, environmental practices, and anti-corruption. Many of these principles are realized through the use of the tool presented in this study, providing water sector companies with aid to achieving and maintaining their CSR goals (United Nations Global Compact, 2007).

Businesses are also beginning to embrace sustainability. In the natural resource sector sustainability is not only concerned with maintaining the long-term viability of the resource but also maintaining profits. Private industry typically plays the role of service provider in a WGS. While their goal may be to generate a profit, if they do not secure the sustainability of the resource, their profits are subject to the availability of water. Sustainable water means sustainable business. Using this planning tool in the evaluation of a WGS makes it possible for the private sector to adjust the WGS so as to increase consumer trust in the system and achieve consumer buy-in for conservation policies. In doing so consumers are getting peace of mind knowing that they have water supply system that reflects their interests while companies are given greater certainty for investment and returns from their operations.

Development Agencies

Many development agencies are involved in the design of WGS for communities in developing countries. While some of these initiatives begin at the grassroots level with considerable public participation, there are those WGS that are imposed on communities as part of structural adjustment programs tied to debt forgiveness or otherwise. The World Bank has received severe criticism for taking this approach to WGS reform. As part of their services the World Bank offers developing countries a water privatization toolkit (a guidance document) to assist national or local decisionmakers in the reform of the existing WGS. The document recently underwent a revision and now strongly recommends that a water service area organization that is considering this type of reform assess the local social suitability of a privatized system and ensures a high degree of public participation in the design process (World Bank. & PPIAF, 2006). However, the World Bank's privatization toolkit does not provide decision-makers with a means to assess social suitability or to initiate dialogue with the public. The tool presented in this study would help to improve consumer trust in the other stakeholders and give decision-makers the ability to determine a suitable variety of water governance systems for a community at the pre-assessment and design stage, making it an ideal companion to the World Bank's Approaches to Private Participation in Water Services toolkit. Once a suitable set of WGS is identified, these can then be presented to the community and the other stakeholders for further evaluation.

The tool can also be used as an applied extension (specific to water) of the World Bank's Social Capital Assessment Tool (SOCAT) which is used to evaluate general areas of social capital and social trust. The results of the SOCAT are used to inform the
operations of development projects, much in the same way as the consumer trust tool is used to inform WGS design.

Consumers & Civil Society

Meaningful communication is often difficult to achieve when water supply and societal conditions that can surround dialogues regarding WGS are tense. Consumers, and the civil society associations that work with them to lobby decision-makers, would find this tool useful in their efforts to have their voice heard. If used, the tool is able to translate local consumer beliefs and values into a set of WGS operating principles that reflect these beliefs and values. Having a set of operating principles to bring to a dialogue not only serves to guide the process but provides the other stakeholders with a more detailed description of consumer preferences in a language (i.e. operating principles) they understand. This can ease communication difficulties and create the space for a dialogue about each operating principle, allowing stakeholders to find the principles they can agree on and tease out those where conflict remains. In doing so, the tool provides a means or realizing the human right to water and self determination, key points on the agenda of many consumer groups and civil society NGOs.

Future Work

This study provides an ideal foundation for further refinement of the planning tool. Future research should expand and refine the survey used in this study's practical exploration. Future research should:

- Determine the relationships of other categories of beliefs and values to consumer supported operating principles;
- Determine the level of consumer knowledge about the attributes of the various types of water governance systems and how closely this knowledge mirrors the reality;
- Increase the number of study communities and participants used to develop the survey tool;
- Refine and apply the proposed tool;
- Evaluate the impact societal conditions have on consumer beliefs and values as well as their selection of operating principles; and
- Attempt to minimize the duplication of data collection efforts by utilizing existing data from other beliefs and values surveys (e.g. the World Values Survey);

ONE FINAL OBSERVATION – A NEW HORIZON FOR BOTTLED-WATER COMPANIES

There is a final observation from this exploratory study that I did not discuss during the practical exploration. During the study participants were provided with a list of possible types of service providers (international corporations, local companies, national government, local government, or community organization) and asked "Who supplies your *drinking-water*?" Approximately 95% of study participants selected "local government". Participants were then asked "Do *you drink* mainly bottled water or tap water?" Nearly all participants from Mexico and Tofino (>95%) said they drink bottled-water and 52% of the participants from Ucluelet responded the same.

As you may notice there is an interesting contradiction in participant responses to these questions. Nearly all participants credited local government as their service provider for drinking-water yet the large majority of participants said they don't actually drink that water (tap-water). Instead, participants drink bottled-water which would typically be supplied by an international beverage company such as Nestle [™] or Coca Cola [™] making an international corporation their service provider. Study participants did not appear to be aware of or concerned about their dependence on bottled-water and international corporations as a source of clean drinking-water, despite their negative opinion of international corporations and their role in water governance.

Where the quality of drinking water resources degrades and the general public becomes increasingly aware of their growing reliance on the services of bottled-water companies as a source of drinking water it is possible that bottled-water companies may arise as a new stakeholder and service provider in water governance. It is also possible this may result in a new form of WGS, one where the water source may not be located nearby but actually thousands of miles from the consumer, owned and operated by an international corporation governed by the rules of international trade not those of their consumers or service area. Is this type of WGS sustainable? How will this impact consumer trust and public participation in sustainable water governance? Will it be possible to realize the right to water and self-determination? This growing reliance on bottled-water may present a new regulatory arena for bottled-water companies as consumers push for water governance reform that would see sweeping changes to how they do business locally and globally.

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APPENDIX A – ONLINE SURVEY QUESTIONNAIRE¹⁸

Table A1. Distribution of questions in the online study broken down by type of question (e.g. background and knowledge, and beliefs and values categories)

Survey Question Categories	Part A	Part B	Part C	Part D	Part E
1. Background and Knowledge					
Professional background	2	-	-	-	-
Current WRGS (service experience, type of system)	3, 4, 5a- 5e, 6	-	-	-	-
Knowledge of the various WRGS	-	-	1a, 2a, 3a	-	-
Level of trust in the various WRGS	7	-	1b, 2b, 3b	-	-
Preferred WRGS	-	1a	-	-	-
Level of trust in Preferred WRGS	-	1b	-	-	-
2. General Beliefs, Values & Trust (Beliefs and values categories)	-	-	-	-	-
Property rights & Access	-	-	-	3, 7a, 7b, 41	-
Decision-making procedures	-	-	-	8, 9	15
Orientation to environment	-	-	-	4	-
Economic Prosperity vs. Environment	-	-	-	12, 15, 22, 29	-
Stakeholder involvement in society	-	-	-	21, 23, 24, 25, 26, 27, 28, 31, 32	-

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Rule of law	-	-	-	2, 13, 18, 20, 43	-
Stakeholder intentions & motivations	-	-	-	1, 5, 16, 33, 34, 35, 38, 39, 40, 42	2, 5, 9, 10
Importance of local knowledge & customs in decision-making	-	-	-	11, 37	4
3. Beliefs/Values & Trust Specific to Water (beliefs and values categories)	-	-	-	-	-
Water Rights (Access & Ownership)	-	-	-	10, 14, 30	-
Trust in service provider	-	-	-	-	12
Importance to individual and community livelihood	-	-	-	-	3, 8, 14
Decision-making procedures	-	-	-	-	1, 7, 13
Stakeholder intentions & motivations	-	-	-	-	6, 11
Perceived quantity & reliability of water supply	-	-	-	17	-
Orientation to water	-	-	-	6, 19, 36	-

Using Consumer Beliefs and Values in the Design 111

ONLINE SURVEY ADMINISTERED TO TOFINO AND UCLUELET

Part A
Please answer the following questions Please enter the code from the blue mailout you received in the mail. If you do not have a code email
carlos danonte@rovalroads ca
(Maximum 4000 characters)
1. Please provide your Postal Code (Required)
(Maximum 4000 characters)
2. Which of the following organizations have you been employed by? Mark all that apply
Covernment or public organization
Private business or industry
Non-profit organization or civil society
Other
3. In the last three years, drinking-water service has:
Improved
Demained the same
Remained the same
Worsened
WOISeneu
4. Currently the drinking-water service in my area is:
5.a Have you ever had any problems with your drinking-water service?
5.b If you answered 'No' to the previous question please skip to Question 6. If you answered 'Yes' to the
previous question please briefly describe the problem.
5.C How concerned are you with the problem you mentioned in 5.a? (1: very concerned; 5: not concerned)
$\Box_{1} \Box_{2} \Box_{3} \Box_{4} \Box_{5}$

5.d If you confronted your drinking-water service provider about the problem what was their reply?

5.e If you are not satisfied with the reply from your service provider, briefly describe what should be done to deal with your dissatisfaction.
6. Who supplies your drinking-water: (Required)
An international corporation
A local company
Local government
National government
A community organization (e.g. a cooperative, a community group seperate from
government)
L don't know
7. On a scale of 1 to 5, how trustworthy is your drinking-water provider? (1: very trustworthy; 5: should not be trusted
Very trustworthy
Should not be trusted

Part B

1a. Which of the following characteristics and values SHOULD BE part of how your area's drinking-water supply is managed? (Mark all that apply)

The reasons for decisions and actions ARE available to consumers

	Local needs & traditional knowledge guide decision-making
	Expert opinions guide decision-making
	Water is viewed as a commodity (decisions motivated by profits)
	Decisions are made in the best interest of the service provider
	Water is viewed as a human-right (no profit made or consumers not charged for use)
	The water resource is owned by the government
	The water resource is owned by the service provider
	The water resource is owned by community-members
	Decisions are made by Consumers
	Decisions are made by elected decision-makers and bureaucrats
	Decisions are made by managers of a corporation
	No Consumer involvement in decision-making
	Decisions are made in the best interest of Consumers
	Decision-makers accountable to shareholders
	Decision-makers are accountable to Consumers
	The reason for decisions and actions are NOT available to the Consumers
	Decisions balance economic, social, and environmental interests
	Long-term planning
	Short-term planning
1b. \	Nould you trust this water service? (1: Trust it completely; 5: Would not trust it)
	1. Would trust it completely
	2
	3
	4
_	

5. Would not trust it

Part C
1a. What do you think are characteristics of a "Consumer operated drinking-water service" (a community run organization separate from government)? (Mark all that apply)
The reasons for decisions and actions ARE available to consumers
Local needs & traditional knowledge guide decision-making
Expert opinions are guide decision-making
Water is viewed as a commodity (decisions motivated by profits)
Decisions are made in the best interest of the service provider
Water is viewed as a human-right (no profit made or consumers not charged for use)
The water resource is owned by the government
The water resource is owned by the service provider
The water resource is owned by community-members
Decisions are made by Consumers
Decisions are made by elected decision-makers and bureaucrats
Decisions are made by managers of a corporation
No Consumer involvement in decision-making
Decisions are made in the best interest of Consumers
Decision-makers accountable to shareholders
Decision-makers are accountable to Consumers
The reason for decisions and actions are NOT available to the Consumers
Decisions balance economic, social, and environmental interests
Long-term planning
Short-term planning

1.b Would you trust a Consumer operated drinking-water service? (1: I would trust this service completely; 5: I would not trust this service)

1. Would trust it completely

2 2 3

□ <mark>4</mark>

5. Would not trust it

2.a What do you think are the characteristics of a "Government operated (public company) drinking-water service"? (Mark all that apply)

_	
	The reasons for decisions and actions ARE available to consumers
	Local needs & traditional knowledge guide decision-making
	Expert opinions are guide decision-making
	Water is viewed as a commodity (decisions motivated by profits)
	Decisions are made in the best interest of the service provider
	Water is viewed as a human-right (no profit made or consumers not charged for use)
	The water resource is owned by the government
	The water resource is owned by the service provider
	The water resource is owned by community-members
	Decisions are made by Consumers
	Decisions are made by elected decision-makers and bureaucrats
	Decisions are made by managers of a corporation
	No Consumer involvement in decision-making
	Decisions are made in the best interest of Consumers
	Decision-makers accountable to shareholders
	Decision-makers are accountable to Consumers
	The reason for decisions and actions are NOT available to the Consumers
	Decisions balance economic, social, and environmental interests
	Long-term planning
	Short-term planning
2.b V	Vould you trust a government operated drinking-water service? (1:Trust it completely; 5:Would not trust
it)	
	1. Would trust it completely
	3
	4
	5. Would not trust it

3.a What do you think are the characteristics of a "Privatized drinking-water service"? (Mark all that apply)
The reasons for decisions and actions ARE available to consumers

	Local needs & traditional knowledge guide decision-making
	Expert opinions are guide decision-making
	Water is viewed as a commodity (decisions motivated by profits)
	Decisions are made in the best interest of the service provider
	Water is viewed as a human-right (no profit made or consumers not charged for use)
	The water resource is owned by the government
	The water resource is owned by the service provider
	The water resource is owned by community-members
	Decisions are made by Consumers
	Decisions are made by elected decision-makers and bureaucrats
	Decisions are made by managers of a corporation
	No Consumer involvement in decision-making
	Decisions are made in the best interest of Consumers
	Decision-makers accountable to shareholders
	Decision-makers are accountable to Consumers
	The reason for decisions and actions are NOT available to the Consumers
	Decisions balance economic, social, and environmental interests
	Long-term planning
	Short-term planning
3.b V	Nould you trust a privately operated drinking-water service? (1:Trust it completely; 5:Would not trust it)
	1. Would trust it completely
D	2
D	3
D	4
D	5. Would not trust it

Part D How much do you agree or disagree with the following statements:
1. In general, the local business shares my beliefs and values.
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
2. More rules should be placed on companies to control how they operate
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
3. There should be increased equality between people with respect to resources and money.
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
4. We should benefit from the economic potential of natural resources
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
5. In general, international corporations share my beliefs and values.
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
6. Water is a means of production to be bought and sold as any other form of capital
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
7. Refer to the following for the next two questions. Given that 'weebles' are a natural resource of unknown
quantity that is used by everyone, rank your agreement with the following statements: a. Everyone should be given weeples for free
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
b Everyone should be allowed unlimited number of weebles
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
8. It is important for my opinion to be heard in the day-to-day decision-making of my community
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
9. To be a decision-maker you must be wealthy
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

10. An individual or group (other than the government)should be given exclusive rights to a natural drinking- water source Strongly Agree Agree Agree Neither agree or disagree Disagree Strongly disagree
11. Traditional knowledge should play a part in decision-making Strongly Agree Agree Strongly Agree Strongly disagree Agree Strongly Strongly Strongly
12. Protecting the environment should be given priority, even if it causes slower economic growth Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
13. Companies are treated the same as private citizens by the legal system Strongly Agree Agree Disagree Strongly Agree Agree Strongly Strongly Agree Agree Strongly
14. Everyone should be given drinking-water for free Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
 15. Protecting the environment should be given priority, despite some loss of jobs. Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
16. In general, the local government shares my beliefs and values. Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
17. My community has a reliable source of water Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
18. The current legal system is fair Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
19. Drinking-water resources should be protected at any cost Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
20. I don't see much use in adhering strictly and literally to the law

Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
21. I play an active part in my community Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
22. Capitalism benefits all classes of people and should be preserved Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
23. Most people with political power try to take advantage of people like me Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
24. Local decision-makers (local government) are active members of my community Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
 25. I believe in the virtues of self-reliance and personal independence Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
26. I feel that basically the world is not a fair place Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
 27. I consider corporations as active members of my community Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
 28. Government agencies should not intervene in the economy Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
29. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
30. Everyone should be allowed unlimited quantity of drinking- water Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree

 31. Power should be in the hands of local governments, not the national government Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
32. In general, the national government shares my beliefs and values.
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
33 In the community where I live people look out mainly for the welfare of their own families and they show
little concern for the welfare of others. Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
34 Companies are profit driven with no thought about social wellbeing
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
35. My level of trust in an individual or group will decrease if they deny me access to information I feel is
public property Strongly Agree Agree Neither agree or disagree Disagree Strongly Agree Strongly
26 Water resources are a part of our shared heritage and access to it is a human right
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
 37. I have a profound respect for historical institutions, laws, and traditions. Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
28. The interacts of local inhabitants should be favoured over interacts of foreigners
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
39. In general, other members of my community share my beliefs and values.
Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
40. The government should take more responsibility to ensure that everyone is provided for.
Strongly Agree Agree Neither agree or disagree Disagree Strongly

41. Private ownership of business and industry should be increased.

Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
43. The current legal system is effective Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree Image: Strongly agree Strongly Strongly Strongly
42. Given the opportunity, international corporations will take advantage of me. Strongly Agree Agree Neither agree or disagree Disagree Strongly disagree
Part E
A printermetional comparation
National government
Local Government
Community group
2. Which group do you believe is the most socially responsible?
An international corporation
National government
Local company
Local Government
Community group
3 Pank the importance of freshwater to your community
1 Not important
Critical to maintaining our way of life
4. In your opinion, which of the following groups understand and consider local knowledge, customs, and circumstances in decision-making? (Mark all that apply)

An international corporation

National government

Local company
Local Government
Community group
5. Which group(s)are most likely to act in THEIR OWN best interests? (Mark all that apply)
An international corporation
National government
Local company
Local Government
Community group 6. Which of the following groups do you believe are most likely to withhold information about water quality from you, as a consumer? (Mark all that apply)
An international corporation
National government
Local company
Local Government
Community group
7. Which group do you trust to regulate the cost of drinking-water delivery?
An international corporation
National government
Local company
Local Government
Community group
8. Rank the importance of freshwater to your way of life
1 Not important
5 Critical to the maintenance of my way of life
9. Which group(s)are most likely to act in YOUR best interests? (Mark all that apply)
An international corporation

	Local company
	Local Government
	Community group
10. V	Vhich one of the following groups do you consider to be the most trustworthy?
	An international corporation
	National government
	Local company
	Local Government
	Community group
11. V	Vhich group should make decisions about drinking-water management?
	An international corporation
0	National government
0	Local company
0	Local Government
0	Community group
12. C	On a scale of 1 to 5, rank your level of trust in the group you indicated in the previous question
0	1 I trust this group completely
0	2
0	3
0	4
O	5 I do not trust this group
13. H	low should decisions about water resources be made in your community? Mark the statement you agree
with	
	decisions should be based on consumer consensus
	decisions should reflect the views of the majority
	decisions should be based how much consumers are willing to pay for water
14. ((mar	Other than personal consumption, what are the primary roles of water in your community and your life? k only two)
	Used for recreation
	Used for farming
	Used for transportation

 Used for trade and commerce Used to produce energy None of the above 15. How should decision-making occur in your community? Mark the statement you agree with: Decisions should be based on a consensus between all member of the community Decisions should reflect the views of the majority Decisions should be based on the monetary costs and benefits to the community Do you drink mainly bottled water or tap water? (choose one) (Required) Tap-water 	
 Used to produce energy None of the above 15. How should decision-making occur in your community? Mark the statement you agree with: Decisions should be based on a consensus between all member of the community Decisions should reflect the views of the majority Decisions should be based on the monetary costs and benefits to the community Do you drink mainly bottled water or tap water? (choose one) (Required) Tap-water 	Used for trade and commerce
 None of the above 15. How should decision-making occur in your community? Mark the statement you agree with: Decisions should be based on a consensus between all member of the community Decisions should reflect the views of the majority Decisions should be based on the monetary costs and benefits to the community Do you drink mainly bottled water or tap water? (choose one) (Required) Tap-water 	Used to produce energy
 15. How should decision-making occur in your community? Mark the statement you agree with: Decisions should be based on a consensus between all member of the community Decisions should reflect the views of the majority Decisions should be based on the monetary costs and benefits to the community Do you drink mainly bottled water or tap water? (choose one) (Required) Tap-water 	None of the above
 Decisions should be based on a consensus between all member of the community Decisions should reflect the views of the majority Decisions should be based on the monetary costs and benefits to the community Do you drink mainly bottled water or tap water? (choose one) (Required) Tap-water 	15. How should decision-making occur in your community? Mark the statement you agree with:
 Decisions should reflect the views of the majority Decisions should be based on the monetary costs and benefits to the community Do you drink mainly bottled water or tap water? (choose one) (Required) Tap-water 	Decisions should be based on a consensus between all member of the community
 Decisions should be based on the monetary costs and benefits to the community Do you drink mainly bottled water or tap water? (choose one) (Required) Tap-water 	Decisions should reflect the views of the majority
Do you drink mainly bottled water or tap water? (choose one) (Required)	Decisions should be based on the monetary costs and benefits to the community
Tap-water	Do you drink mainly bottled water or tan water? (choose one) (Required)
Tap-water	
F-1	Tap-water
Dettled weter	
Bottled-water	Bottled-water

Comments and Suggestions

Please provide any comments, suggestions, or questions you may have. Including specific question numbers is helpful.

If you wish to be considered in the draw for a \$150 GIFT CERTIFICATE to a local restaurant please provide your email address below. All questions must be answered to be ELIGIBLE to participate in the draw. Please remember that your personal information will be stored SEPERATE from your answers and will only be kept for the duration of the draw and then stored in a secure file.

APPENDIX B: ETHICS REVIEW

Royal Roads University

Request for Ethical Review

For Research Involving Humans

Revision of the Form Approved by RRU Academic Council 18 August, 2004

If your research involves human subjects then it most likely requires an ethical review by the Royal Roads University Research Ethics Board (or one of its subcommittees). Please refer to the *Royal Roads University Research Ethics Policy* (**Fall 2004**) for specific guidance on identifying research that requires ethical review.

Reference to the *Royal Road University Research Ethics Policy* will assist you in understanding the questions below and will help you formulate your responses. If you have additional inquires contact your faculty project supervisor, the Dean of your Division, the Program Director, or the RRU Director of Research.

Research involving human subjects cannot be initiated until the Request for Ethical Review has been approved.

Please allow four weeks for the decision of the Research Ethics Board if a regular review is required. Expedited reviews will generally take less than four weeks to turn around.

 Principal Investigato Carlos da Ponte 	or: MEM,	Division: MEM, School of Environment and Sustainability		ainability
Faculty: 🗌 Graduate L	earner	Undergraduate Learner	\square	Staff 🗌
Other Specify:				

Mail Correspondence and/or approval to:

If learner, specify Faculty Project Supervisor/Advisor and Sponsor/Client

Faculty Project Supervisor/Advisor: Erik Karlsen

Project/Thesis Sponsor/Client: Not Applicable Sponsor contact name: Telephone: E-Mail Address:

Co-Investigators: Not Applicable

II. Short Title of Project (no more than 10 words)

An Examination of Consumer Trust in Relation to Water Governance

Keywords

Provide 4 keywords/key phrases that describe this project.

- 1. Sustainable water governance
- 2. Social trust in resource management
- 3. International development
- 4. Environmental psychology

III. Summary of Proposed Research

Brief but complete description, in non-technical language of the purpose, objectives and research questions of the project. USE NO MORE THAN ONE PAGE.

Purpose

This study will examine the statistical correlation between consumer beliefs about societal characteristics (societal interactions, government, industry, economy, environmental security, etc...) and the willingness to trust a water governance system (WGS) (e.g. public, private, or community management).

(a) Objectives

The following objectives will be used to set the foundation of the study and later aid in answering the study question while proving or disproving the hypothesis:

- Briefly characterize existing models of WGS in use worldwide;
- Evaluate the consumer beliefs about the societal characteristics (societal interactions, government, industry, economy, environmental security, etc...) which give rise to social and political trust;
- Evaluate the level of trust in different types of WGS, using the individual's preference to delegate the responsibility to different provider groups;
- Determine the correlation between the consumer trust associated with different societal characteristics and different WGS;

Research Questions

Can consumer beliefs about societal characteristics be used as an indicator of the type

of water governance system that the consumer would trust?

IV. Summary of Methodology and Procedures

Brief but complete description, in non-technical language of the methodology and procedures. USE NO MORE THAN ONE PAGE.

Note: Append to this application a copy of your questionnaire, interview guide, survey, test instrument, or other research instrument to this application. If it is not complete, then please submit your "best draft" or gist of the instrument. When your final instrument is available, please submit to your faculty project supervisor for approval. If there are significant changes, approval may be sought from the REB or appropriate subcommittee that monitors the amended submissions.

Methodology: The research is designed to determine how consumer trust in a WGS varies with consumer beliefs about societal characteristics. The study will consist of three components:

- Extensive literature review to assist in survey design and bridging of multidisciplinary topics such as the relationship between shared values and trust, social trust and sustainability, and WGS;
- b. A quantitative survey, providing participant background and incorporating the use of a combination of validated scales to assess trust, to determine the correlation between consumer trust in WGSs and consumer beliefs about societal characteristics; and
- c. A Participatory Appraisal (town meetings in Mexico only) involving several activities and open-ended discussions about consumer trust.

The survey component of the study will be administered in Tofino and Ucluelet, B.C., Canada, while the participatory appraisal will be conducted in Puerto San Carlos, Mexico.

Data collection will proceed in three phases:

Phase I: a voluntary test survey will be administered electronically to the MEM Cohort during the MEM 2007 Residency;

Phase II: a participatory appraisal in Puerto San Carlos, Mexico, consisting of 2 – 3 town meetings involving water resource mapping activities and open discussion about water governance;

Phase III: a voluntary final version of the Phase I survey will be administered electronically in Ucluelet and Tofino, British Columbia. Interviews based on the survey questions will be conducted with local decision makers and stakeholders pending their availability.

V. Description of Population

a. How many subjects/participants will be used?

- The MEM Cohort Test Survey: 100 -150 participants
- The Ucluelet and Tofino Survey: 100 150 participants each (~300 total)
- The Puerto San Carlos Participatory Appraisal: 2 3 groups of 8 10 participants (16 – 30 total)

b. Who is being recruited and what are the criteria for their selection? (Justify any exclusion of prospective or actual research subjects on the grounds of attributes such as race, sex, age, culture, race, and mental or physical disability.)

Only individuals of voting age (+18 years old) will be permitted to participate in the survey and participatory appraisals as they have decision-making power in their respective communities. For the participatory appraisals, participants will be recruited so as to have individuals with different careers and types of livelihood (e.g. fisherman, shop owners, entrepreneurs)

VI. How are the subjects being recruited?

- By letter (enclose a copy)
- By telephone (If yes, complete "Telephone Contact Form")
- Advertisement, poster, flyer (enclose a copy)

Other (explain)

- The MEM Cohort Test Survey: email letter invitation to MEM email group
- The Ucluelet and Tofino Survey: mail letter invitation
- The Puerto San Carlos Participatory Appraisal: will be invited by verbal invitation by the principle researcher or by assistant in the community. A script following the letter of consent guidelines will be followed.

How and when are subjects informed of the right to withdraw? What procedures will be followed for subjects who wish to withdraw at any point during the study?

Participants are informed of the right to withdraw prior to commencing the survey and participatory appraisal/interviews. If an individual wishes to withdraw, their withdrawal will be noted and answers not included in the final data analysis.

VII. Research Project Details

- a. Where will the project be conducted?
 - Puerto San Carlos, Baja California Sur, Mexico

- Ucluelet, British Columbia, Canada
- Tofino, British Columbia, Canada
- b. Does your sponsoring organization or any of the organizations involved in your research require an ethical review?

Yes 🗌	No	\boxtimes
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If yes, has approval been granted?

Yes 🗌	No 🗌
-------	------

- c. If other institutions or jurisdictions are involved, what ethical review of the project has been conducted or is proposed?
 - Not applicable.
- d. For research in other countries, indicate how the research will conform to the laws and customs of that country.
 - I will adhere to the customs and protocols of Mexico and the Royal Roads University Research Ethics Policy.
- e. Is this an amendment from a previously approved protocol?

No 🖂	Yes 🗌	Date:
------	-------	-------

VIII. Involvement of Aboriginal Individuals or Communities

Will the research involve aboriginal individuals? Yes \Box No \boxtimes

If yes, will any of the following considerations apply? (Provide a brief explanation
of any relevant considerations and indicate how approval of the community as a
whole will be obtained.)

- Property or private information belonging to an aboriginal group as a whole will be studied or used.
- Leaders of the group will be involved in the identification of potential participants
- The research is designed to analyze or describe characteristics of the group
- Individuals are selected to speak on behalf of, or otherwise represent, the group.

IX. Free and Informed Consent

Evidence of free and informed consent by the subject or authorized third party should ordinarily be obtained in writing (See Checklist for Consent Form and include a copy of the letter or other format by which you will obtain consent in writing). Obtaining informed consent from your research subjects is mandatory, however the method by which the informed consent is obtained may vary. For example, in completing a survey, one method of handling the need to inform research subjects is to include, as a preface or preamble to the survey, the same sort of information that would otherwise be included in a letter of consent.

a. Have you included, attached to this "Request for Ethical Review" a sample letter of consent? Y

∕es ⊠ No	
----------	--

- Attached are three consent forms.
 - 1. MEM Cohort Test Survey Preamble
 - 2. Online Survey Preamble
 - 3. Puerto San Carlos Participatory Appraisal Preamble

NOTE: The third letter of consent will be delivered verbally; this letter offers a general guideline for the information that will conveyed during the verbal invitation and will be translated into Spanish

If no, document the procedure by which free and informed consent will be obtained.

- a. Will the subjects have any problem giving free and informed consent on their own behalf? (Consider physical or mental condition, age [e.g., under 18], language, incarceration or other barriers). Yes 🗌 No 🖂
- b. Are subjects **not competent** to give free and informed consent? Yes 🗌 No 🖂

If the subjects are not competent, who is empowered to give consent on their behalf? And what is the process for seeking this consent?

Is any form of deception of subject's part of the research design? C. Yes 🗍 No 🖂

If yes, describe and justify the proposed deception.

If deception or any other alteration of the conditions of Free and Informed Consent are proposed, complete a Request for Waiver of Full Consent. See Section I of the Royal Roads University Research Ethics Policy

Χ. Risks a. Does the research in your view conform to the standard of "minimal risk"?

"Minimal Risk": if potential subjects can reasonably be expected to regard the probability and magnitude of possible harms implied by participation in the research to be no greater than those encountered in those aspects of his or her everyday life that relate to the research, then the research can be regarded as within the range of minimal risk.

Yes 🛛 No 🗌

If No, please explain how it exceeds minimal risk.

- b. Describe the potential and anticipated risks of the proposed research.
 - I do not foresee any risks to participants or researchers who are part of the proposed research.
- c. What inducements (monetary or otherwise) will be offered to prospective subjects? If payment is to be made, provide details or amounts, payments schedules and other relevant details.
 - 1) MEM Cohort Test Survey: 1 Apple iPod Shuffle (1GB MP3 Player) worth approximately \$80.
 - 2) Ucluelet and Tofino Surveys: 2 Apple iPod Shuffles (1GB MP3 Player) worth approximately \$80 each..
 - 3) MEM Cohort Test Study: 1 Apple iPod Shuffle (1GB MP3 Player) worth approximately \$80.
 - 4) Mexico Participatory Appraisal Participants: Royal Roads and Canada Souvenirs (e.g hats and/or pins)
- d. How much time will a subject be expected to dedicate to the project?
 - Survey should take 15-25mins.
 - Group meetings 1.5 3hrs

XI. Benefits

What are the likely benefits to the researcher, to the subjects, to the sponsor, and to society at large that justify asking subjects to participate.

The results of this research will guide the future design and use of socially acceptable water governance systems that will produce intended results (e.g. equitable,

accessible, affordable, adequate quantity to meet consumer needs, clean water). This information will then be used to make recommendations on the design of water governance system needed to achieve these intended results. Furthermore this study will provide the basis for the development of a consumer trust assessment tool tailored to water management issues.

XII. Confidentiality and Anonymity

- Will the project obtain information from research subjects, which is not available through publicly available sources? For example, are name, ages, opinions, views, etc. to be collected?
 Yes ∑ No □
- Will such information be obtained only from publicly available information (e.g., from existing books or Stats Canada information)? or materials
 Yes □ No ⊠

If No, describe methods for obtaining and handling data, including the following:

- a. The type of data to be collected.
 - Opinions about aspects of society including government, corporations, society at large, and water governance systems.
- b. The purpose for which the data will be used.
 - This data will be used evaluate the correlation between consumer beliefs about aspects of society, referred to as societal characteristics, and their willingness to trust different types of water governance systems
- c. Limits on the use, disclosure and retention of the data.
 - Data will only be used for the purpose outlined in section III of this document (the purpose of this research);
 - Data will only be viewed by the principal researcher, the thesis supervisor; and
 - Data will be kept until December 2008
- d. Appropriate safeguards for confidentiality and security.
 - Data will kept on a password protected computer in a password protected file; if hardcopy backups are made to digital media these will also be password protected.
- e. Any modes of observation (e.g. photographs or videos) or access to information (e.g. sound recordings) that allow identification of particular subjects.
 - Sound recordings and possibly photographs will be taken during the participatory appraisals only after informed consent is given;
 - Such materials will be used as reference (sound recordings) and

presentation (photographs) purposes

- Such material will safeguarded in the same manner as the data.
- f. Any anticipated linkage of data gathered in the research with other data about subjects whether those data are contained in public or personal records.
 - No linkages will be made between the data obtained and other data about the subjects.
- g. Provision for confidentiality of data resulting from the research.
 - I do not anticipate any such provisions being required; if so such data will remain in strict confidence.
- h. Is secondary non-public use of identifiable data anticipated? (For example, do you plan to use identifiable information that you gather in the course of your research project for a purpose other than your research project?)
 - Yes 🗌 No 🖂

If YES, describe methods for obtaining and handling data, including the following:

- a. Why identifying information is essential to the research.
- b. What measures will be taken to protect the privacy of individuals
- c. Evidence that individuals involved have no objection to secondary use proposed methods of obtaining informed consent of those who contributed the data or of authorized third parties.
- d. How will subjects will be informed about the potential secondary use and/or methods for consulting with representatives of those who contributed the data.

XIII. Feedback to Subjects

Will the subjects be debriefed at the end of the research project?

- \boxtimes Yes. Explain how this will be done.
 - The findings of the research will be available online for research participants to view. Participants will also be able to obtain a copy of the research from Royal Roads University. There is insufficient time and resources to provide any in-person debriefs.

No. Explain why not.

XIV. Conflict of Interest

Provide full details of any actual, perceived, or potential conflict of interest, economic, family-related or otherwise, on the part of the principal investigator and co-investigators. (For example, if you are the teacher of students or the employer or manager of employees whom you will be inviting to be part of your research, that would be a conflict of interest situation which would need to be addressed. Are you an employee of an organization where your fellow employees will be potential research subjects? That too would be a conflict of interest situation.) Indicate how this conflict will be addressed with your research subjects. What measures will you be taking to ensure that your research subjects are apprised of the conflict of interest? Any and all conflicts of interest must be disclosed in your consent documentation (as outlined in Question IX).

- For Phase I of the study (MEM Cohort Test survey), a conflict of interest may be present as the participants would be the peers of the principal researcher in the MEM program. In this case potential participants will be notified of the possibility of a conflict of interest in the MEM Cohort Test Survey Preamble; they will be informed that whether they choose to participate or not, they will bear no consequence as a peer of the principal researcher.
- For the I do not foresee any issues of conflict of interests arising due to public participation as all participants would be volunteers, with no consequences for declining to participate if they choose to.

XV. Compliance

I understand that the Royal Roads University Research Ethics Board may request from me my research documentation and my research results to demonstrate compliance with the Royal Roads University Research Ethics Policy and to demonstrate my compliance with my approved request for ethical review.

Please check here: 🔀

All applicants:

Carlos da Ponte

Dec 17, 2006

Principal Investigator

Date

Not Applicable
Using Consumer Beliefs and Values in the Design 136

Co-investigator	Date	
		_
If learner:		
Faculty Project Supervisor/Advisor		Date
If faculty member or other:		_
Dean		_ Date
Where the Dean is the Principal Investigator, the sign Academic is required.	ature of the Vic	e President
Vice President Academic		Date

APPENDIX C: DETAILED ONLINE SURVEY ANALYSIS METHODS

Descriptive Statistics

Several descriptive statistics were calculated for the online survey data. They include: mode, average, maximum value and minimum value. The descriptive statistics that were calculated varied depending on the type of data that was collected.

Collapsed Categories

To facilitate more meaningful analysis, it is common practice to collapse categorical answers into smaller categories based on common attributes of the original categories. For example, Part D of the survey made use of a 5 point scale consisting of: strongly agree, agree, neither, disagree, and strongly disagree. Since strongly agree can be viewed as a stronger variation of agree, the results of strongly agree can be combined (collapsed) with those of agree (Leedy & Ormrod, 2004; Haji Hassan & Mohamad Sheriff, 2006). This method was used in several occasions during the analysis of the online survey data as part of the exploration of the primary and secondary study questions. The table below outlines all the questions where collapsed categories were used as an analysis method.

Online Survey Part	Question	Original Categories	Collapsed Categories
Part A	A4	Very Good and Good	Good
		Very Poor and Poor	Poor
	A5C	Very Concerned and Concerned	Concerned
		Not Concerned and Indifferent	Indifferent
	A6	Local Government and a	Public - Local
		Community Organization	
		National Government	Public - National
		Local Company and International	Private

 Table C1. List of Collapsed Categories from the online survey.

		Corporation	
		Very Trustworthy and Trustworthy	Trustworthy
A7	A7	Unreliable and Should Not be	Unreliable
		Trusted	
Part D		Strongly Agree and Agree	Agree
	D1 - D44	Strongly Disagree and Agree	Disagree
	E1, E2,	Local Government, Local	Local
Part E	E4 - E6	Company, and Community Group	
	E9 - E11		
	E1, E2,	National Government and	National or Intl
	E4 - E6	International Corporation	
	E9 - E11		
	E1, E2,	Local Government and a	Public - Local
	E4 - E6	Community Organization	
	E9 - E11		
	E1, E2,	National Government	Public - National
	E4 - E6		
	E9 - E11		
	E1, E2,	Local Company and International	Private
	E4 - E6	Corporation	
	E9 - E11		

Contingency Tables

Contingency table results are displayed as percentages. These results represent a percentage relationship between participant responses to the various survey parts being compared. For example, 80% of survey participants provided the same response to question 1 of Part A while also selecting (or rejecting) the WRGS operating principle #3 in Part B. While a majority of the questions in each part could be evaluated using contingency tables, some questions were not analyzed in this way as the response contained multiple selections or consisted of a written answer.

Those questions where more than 60% of participants provided the same response to a question in Part A, D, & E while also selecting (or rejecting) the same operating principle in Part B were compiled into tables for further study (see Appendix A).

As outlined in the survey design all questions within Part A, D, & E can be grouped into themes (e.g. types of beliefs or values, background information, etc; see Table B2). To allow for meaningful discussion of the exploration's findings, the results of the contingency tables for those questions from Part A, D, & E with a greater than or equal to 60% relationship were summarized into their thematic groups. In the case where 2 or more questions from the same thematic group yielded a relationship of >60% with a given operating principle, the average relationship of these questions were calculated as well as the minimum and maximum percentage relationship. Appendix D presents all the relationships found between the categories of participant beliefs and values (Part A, D, & E) and their selection of operating principles (Part B).

Table C2. The relationships being explored between participant selection of WGS operating principles (Part B) and their beliefs and values (Part A, D, and E).

Relationship Being Explored		Parts of Online Survey Compared	
Participants choice of operating principles (Part B)	Participants background (Part A)	Part B vs. Part A	
	Participants general beliefs & values (Part D)	Part B vs. Part D	
	Participants beliefs about other stakeholders (Part E)	Part B vs. Part E	

APPENDIX E: DEFINITIONS

The following definitions are those used to describe key terms throughout the study.

Trust:

The belief that other actors in society will not harm or negatively alter your circumstance, and at best, will try to act in your best interests (Govier, 1997). Trust is said to be the result of beliefs individuals have about their society and environment, known as societal conditions. (Earle & Cvetkovich, 2000)

Beliefs and Values

Oxford English dictionary defines beliefs as "...firmly held opinion(s)."(Author, 2007). This is the definition used herein.

Oxford English dictionary defines values as "...the regard that something is held to deserve; importance or worth." (Author, 2007). This is the definition used herein.

Societal Characteristics:

These include:

- Societal interactions (e.g. how decisions are made, resource distribution)
- The existing social and structural institutions including their processes¹⁹;
- Reliance on the environment and its quality;
- The relationships between community members; and
- The history of the conditions in the community.
- These conditions manifest themselves in unique combinations in every

community, and hence can only be incorporated into decision-making in the presence of decentralized governance and subsidiarity.

¹⁹ These institutions, systems, and processes include, but are not limited to, government, industry, economic institutions and processes, religion, and civil society.

Water Governance:

A fundamental shift in the development, implementation, and outcome of public policies will be required to ensure sustainable drinking water resources. A society where the social, economic, political, and environmental needs are factored into decisions and realized in the outcomes will have a very different set of regulations, many of which will require the public to adopt new habits in their everyday lives. How these changes to public policy occur is determined by the type of governance system in place. These systems comprise "all social, political and economic organizations and institutions, and their relationships, insofar as they are related to the realm of the public policy being discussed."(UN)⁷ If we consider governance in the context of drinking water policy, the governance system "is concerned with how institutions rule and how regulations affect political action and the prospect of solving given societal problems, such as efficient and equitable allocation of water resources"⁷

The Systems:

There exist four distinct types of water governance systems (WGS). What distinguish these systems are the different combinations of operating principles. The operating principles of a WGS determine such criteria as the level of consumer involvement in decision-making, transparency, and equity. It also determines whether the provider will be a community group, a government-owned corporation, or a private corporation. For example, as we proceed from left to right along the governance system line consumers play a reduced role in the decision making process while private control/ownership of infrastructure increases. Hybrids of these WGS may exist between each of the four major types, further refining stakeholder roles, decision-making procedures, and degree of access to the resource.



These systems are formed through the decisions made by the stakeholders with decision making powers.

Water Service Area:

Drinking water governance systems have many forms yet it is a global occurrence. Wherever human settlements reside, water governance is present. The Water Service Area (WSA) is a geographical or political area whose population (the consumers/public) is provided with water by a water service provider (the provider) that is bound by the WGS. The boundaries of these areas, typically decided on by the most influential of the stakeholder groups (primarily government decision-makers), vary in size with socio-economic and political characteristics, density, population, and environment.

The Actors:

Drinking water governance relies on the interactions and decisions of several different stakeholder groups. The following stakeholders make up the major stakeholder groups with regards toWGS.

• Water Service Provider (the Provider): the stakeholder group (or groups) who have been delegated the responsibility of managing a water service area, providing the consumers in that area with water. The type of provider varies with the WGS; for example the provider can be a consumer cooperative, a multinational corporation, or an autonomous government company. The Provider is directed by the operating principles of the WGS. The decisions made by the Provider also modify the operating principles as they incorporate their beliefs and values into decisions such as service price and stakeholder involvement in decision-making. The level of ownership the Provider has over the distribution system and water source is dependent on the WGS by way of the contract between the Provider and the government or consumers.

- **Consumers (aka public):** This stakeholder group is provided water by the WGS and is directly impacted by any changes to the WGS.
- Government: the institutions in place in a country or society that manage public affairs. In the context of this study the state, regional, or local administration responsible for the allocation of publicly held freshwater sources in a state. The government decision-makers play a key role in formulating the WGS
- Non-Governmental Organizations: those organizations that can influence the type of WGS that is implemented in a water service area (i.e. the World Bank, the Council of Canadians). These organizations represent the beliefs/values of their membership and partners and may not represent those of the consumers in a service area.
- Industry: those locally owned and operated businesses or international businesses that conduct for-profit business as water service providers or partners in a WGS.