ETHICAL ISSUES OF WATER RESOURCE MANAGEMENT IN A CHANGING CLIMATE: EQUITY AND LEGAL PLURALISM IN CHILE

by

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Climate change is disrupting the underpinnings of effective water management by profoundly impacting hydrological patterns. Political entities mandated with freshwater management must respond to society's water needs as availability fluctuates and, in doing so, will encounter difficult ethical dilemmas because existing water laws are ill-equipped to resolve such problems.

This thesis takes Chile's water laws as representative of the challenges in addressing ethical disparities arising from freshwater management in a changing climate and proposes that "water ethics" can effectively be used to manage freshwater resources. I examine the 1981 Water Code with a critical eye towards ethical shortcomings and also examine distributive impacts upon indigent farmers and indigenous communities. I conclude that Chile's existing water laws are inequitable because they deny legitimacy to diverse socio-cultural norms regarding water use. Principles of modern water laws must

incorporate diverse cultural water norms using a legally pluralistic and ethical approach to management.

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TABLE OF CONTENTS

Chapter Page

I. INTRODUCTION 1

II. CLIMATE CHANGE: THE IMPACT ON FRESHWATER RESOURCES AND THE INEQUITABLE IMPACT ON SOCIAL SYSTEMS 10

Climate Change 10

Impacts on Hydrological Systems 15

Inequitable Impacts on Social Systems 19

Implications for Law and Policy 21

III. WATER ETHICS: TRANSLATING THE VALUES EMBEDDED IN FRESHWATER RESOURCES INTO AN ETHICAL FRAMEWORK 23

IV. CHILEAN WATER LAW 36

History and Background 36

The Chilean Constitution 45

The 1981 Water Code 47

Ownership 47

Acquiring a Water Right 54

Transferring Water Rights 58

Coordinating Multiple Uses 59

Limitations on Water Rights 59

The DGA 62

Chapter Page

Water User Associations 63

Conflict Resolution 65

IV. CASE STUDIES 67

The Disparate Effects of Water Resource Management: Case Studies 68

Low-Income Farmers 68

Indigenous Populations: Mapuche 73

Indigenous Populations: Aymara 76

Common Themes 81

Factoring in Climate Change 83

IV. ETHICAL ISSUES 84

Water Markets 85

Narrow Definition of Legally Cognizable Interests 87

Conflict Resolution 88

Water User Associations (WUA) 88

Judicial System 90

Weak Governing Agency 92

Coordinating Multiple Users and Absence of a Priority System 93

Severance of Land and Water 94

Absolute Private Ownership 95

Diminished Collective Management 98

Chapter Page

IV. THE RISKS OF A UNIVERSAL NORMATIVE AUTHORITY GOVERNING FRESHWATER RESOUCE MANAGEMENT 101

Water Resource Management Discourse 102

The Contested Nature of Water Rights and Ethical Solutions 107

Debating a Pluralist Paradigm of Freshwater Resource Management 109

IV. CONCLUSION 114

Constructing an Ethical Framework 114

The Benefits Derived From an Ethical Framework 115

Concluding Remarks 117

BIBLIOGRAPHY 119

CHAPTER I

INTRODUCTION

Climate change will have profound impacts on global hydrological patterns and the availability of freshwater resources, which will thereby force local, regional, national, and international communities to reallocate freshwater resources to meet society's demands for water. Current legal regimes that manage freshwater resources are constructed upon the concept that water is both a stable and renewable resource and that water availability is predictable. However, climate change will alter precipitation and water flow patterns that will, at a minimum, exert stress on legal regimes or, at worst, render them obsolete. Because humans have an indelible relationship with water and water is a necessary resource for social development and stability, governments are obligated to reform water policies to address changing hydrological conditions. Undoubtedly, the redistribution and reallocation of water resources as a result of climate change will be one of the most challenging and profound environmental policy agendas that legislatures and governments will face this century given the complex legal, moral, economic, and political issues embedded in water.

Water policy reform should be a priority even in the absence of climate change as the demand for water is increasing given the competing water needs and uses of various stakeholders resulting from the growing global population. Current models of natural resource management are incapable of addressing the needs and cultural values of water

held by the various segments of society. Consequently when there is not enough water, water uses and rights become contested, leading to the eruption of disputes and conflicts that place stakeholder against stakeholder. Controversy occurs not only because of conflicting needs and demands over water but also because adversaries ascribe different values and ethical responsibilities to water. The human relationship with water is a complex blend of values and ethics. Water laws, which govern human behavior in regards to water allocation and distribution, do not reflect or protect these principles. Water laws instead divorce water from context-specific circumstances and apply a universal approach to natural resource management. Problems with equity and access arise under this model because a universal legal regime fails to account for "water culture," the sociocultural values tied to specific communities and geographies. Thus in order to reform water laws appropriately to respond to climate change, water laws need to be reconceptualized to acknowledge and validate cultural values and ethics. I call this new model an "ethical framework" for freshwater management.

An ethical framework is a set of policies derived from culture that promote particular values. These values, when codified into legitimate legal authority, create a code of ethics that "pertain to the tacit rules of behavior and consequences that regulate people's lives, activities, and decision making."[1] When ethics are applied specifically to water resource management, the concept of water ethics emerges, which I define as a theory that uses cultural values to govern the allocation, protection, and accessibility of water. To ensure the continued existence of cultural traditions, sustainable growth and

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[1] Gabriel Eckstein, *Precious, Worthless, or Immeasurable: The Value and Ethic of Water*, 38 TEX. TECH L. REV 963, 967 (2005).

development, and societal stability in the face of climate change, I propose that legal regimes managing freshwater resources must be reformed using an ethical framework and governed by the concept of water ethics.

Because there is no universally agreed upon code of the ethics as the concept of ethics is as diverse as the communities that promote them, policy reforms promoting water ethics must naturally embrace legal pluralism. According to Rutgerd Boelens, professor and researcher of water management, "legal pluralism provides important insights for the understanding of water rights. Water resources...are often used and managed under legally plural conditions, in which rules and principles of different origins, legitimated by different legal and normative frameworks, coexist and interact."[2] If Boelens is correct in asserting that water can be managed using a legal pluralist paradigm, sovereignties then need to identify what segments of society do not have legitimized water norms and incorporate those norms into a management scheme.

Developing ethical water policy reforms to account for climate change requires several considerations such as how best to manage water in an unpredictable climate, identifying what legal provisions will promote these goals, and ensuring that management practices do not have disparate impacts among various stakeholders. Before offering policy recommendations to construct an ethical framework for freshwater resource management, defects about how current legal regimes hinder or promote a society's water values must first be examined. This thesis addresses the foundational challenges in

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[2] Rutgerd Boelens, Margreet Zwarteveen & Dik Roth, *Legal Complexity in the Analysis of Water Rights and Water Resources Management*, *in* LIQUID RELATIONS – CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 13 (Dik Roth et al. eds., 2005).

constructing an ethical framework to manage water resources. No water ethic reform can be constructed without first examining what legal practices are problematic and what practices are innovative. This analysis shows that current western legal models are ill equipped to handle the ethical dilemmas of water management and will only worsen as a result of climate change. Analyzing models for water resource management requires asking questions such as: what segments of society have inequitable access to water? In times of shortage, who has access to water? How will climate change impact water access and availability for marginalized and indigent populations? Who is participating in making these laws? What interests are being represented? The answers to these questions lie in both specific legal provisions and broader theories of legislation and cultural identity.

To frame the discussion of ethical water management and to draw conclusions about water ethics as a discourse, I have selected Chile's 1981 Water Code as a case study. Before outlining the specific values in using Chile's water management system as a case study, it is first important to state that there is no one management scheme that is representative of how other nations manage water resources. Every water management scheme is a unique blend of the culture, politics, and is intimately tied to geography. Take for example the two dominant models of water rights in the United States: riparian rights and prior appropriation.[3] States in the eastern United States, a region with historically abundant water resources, employ a variation of riparian rights, which ties water use to adjacent land. However, riparian rights were too restrictive to meet water

[3] For a comprehensive history of riparianism and prior appropriation, *see* JOSHUA GETZLER, A HISTORY OF WATER RIGHTS AT COMMON LAW (2004).

demands in the western United States where water is both seasonally and geographically scarce. Thus, western states developed the doctrine of prior appropriation, which severs water rights from adjacent landownership and allows water to be transported and used where it is most needed. Although U.S. states manage freshwater resources under either of these two models, each state has adjusted the doctrine to meet the state's cultural, political, industrial, and hydrological specificities.

Given the unique nature of each water management scheme, it is impossible to identify one model that is entirely representative of many other models. Thus while Chile's model does not entirely represent of how other sovereignties manage their water resources, there are aspects of the Chilean Water Code that are used by other nations. For instance, Chile's code severs water rights from landownership, which is precisely how the prior appropriation doctrine manages water. In other words, there are legal principles used by the Chilean Water Code that are used by other nations. These similarities make the Chilean management scheme representative of other water management models.

I selected the Chilean model for multiple reasons. Chile's model highlights the vast and complex types of ethical problems governments and agencies encounter with freshwater management. Chile manages freshwater resources using a free-market approach, a system that serves as "the leading international example of free market water policies."[4] Chile reformed its water sector in 1981 by deregulating and decentralizing water management in order to promote a private and market orientated system, a reform

[4] Victor Galaz, *Stealing From the Poor? Game Theory and the Politics of Water Markets in Chile*, 13 ENVTL. POL. 414, 415 (2004).

that has been called "the most profound reform that has ever been carried out worldwide in this sector."[5] A free-market system is often advocated as the best approach to manage diminishing freshwater resources because its inherent flexibility and treatment of water as a valuable resource, and thus, it is appropriate to critique this management scheme in light of climate change. Under the free-market model, water is treated as an economic good and intergovernmental agencies, including the International Monetary Fund (IMF) and World Bank, have imposed the Chilean water model onto other developing countries.[6] Thus in choosing the Chilean model to study, I can simultaneously critique dominant development and natural resource management practices.

Another reason I have selected Chile as the focus of my research is that previous studies have examined the impact of the 1981 Water Code upon disadvantaged populations such as indigenous communities and indigent farmers.[7] These works have examined both the efficiency and distributive effects of water policy reform and provide excellent empirical evidence to show that legal regimes have ethical implications. Included in these case studies is a brief commentary about the 2009 landmark Chilean

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[5] Donato Romano & Michel Leporati, *The Distributive Impacts of the Water Markets in Chile: A Case Study in Limarí Province, 1981-1997*, 41 Q. J. INT'L AGRIC. 1, 1 (2001).

[6] "The national water law and policy of Chile has been, and continues to be, considered by many one of the world's most successful and effective water governance models. In the eighties and nineties, Peru, Bolivia, and Ecuador, as well as many other Latin American countries, were forced by the World Bank, IMF, and Inter-American Development Bank to adopt neoliberal water legislation, copying the Chilean model." Rutgerd Boelens & Margreet Zwarteveen, *Anomalous Water Rights and the Politics of Normalization, in* LIQUID RELATIONS – CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 106 (Dik Roth et al. eds., 2005).

[7] *See, e.g.*, Romano, *supra* note 5; Galaz, *supra* note 4; ROBERT R. HEARNE & K. WILLIAM EASTER, WATER ALLOCATION AND WATER MARKETS: AN ANALYSIS OF GAINS-FROM TRADE IN CHILE (World Bank Tech. Pap. No. 315, 1995).

Supreme Court decision that granted the Aymara communities of northern Chile water rights over Agua Mineral Chusmiza, a private corporation that wanted to bottle the water running through the Aymara land that has been traditionally used by the indigenous community. The common theme running through these case studies is that Chile's current water management raises serious equity concerns and I propose that an ethical framework could resolve these disparities.

Examining Chile's water laws employing a critical eye for ethical deficiencies exposes the various legal provisions that will impede the country's ability to respond to climate change ethically. Among those dilemmas identified is the definition of water as a private good which is the cornerstone of Chile's market-based system. Treating water as an economic good is in direct opposition with the ethical management of water because market forces cannot account for the social, ecological, religious, or cultural values of water. An additional impediment to the ethical management of water is the basic principles that form the core of modern water law. In this thesis I argue that a homogenous neo-liberal approach to water resource management is capable of destroying cultures even though the model seemingly creates equal access to water.

Identifying the ethical concerns in the Chilean water model also has implications that extend beyond national borders. For instance, tradable water rights have long been a favored policy recommendation for developing economies. With the advent of climate change, which will make the world's water resources more scarce and therefore more financially valuable, governments and development agencies will have a greater incentive to create or expand tradable water rights. Through illustrating the ethical shortcomings of

water as a private good under Chile's water model and shortcomings of an institutional approach to water management, I hope to draw an analogy to the broader ethical concerns underlying the commodification and globalization of water.

To illustrate how the Chilean water model will hinder or promote ethical water resource management responses to climate change, I provide a brief overview of climate change and the impacts climate change will have on hydrological systems in Chapter II. Presenting this information first is important since climate change functions as the underlying impetus for this thesis. Chapter III presents the concept of water ethics. A discussion of water ethics is critical to understand why water management is so complicated which in turn begins to expose the challenges governing bodies will face if policy decisions are ethically reformed. I debate whether or not a universal water ethic is achievable or practicable because cultures value water differently, and imposing a universal framework runs the risk of homogenizing and dominating diverse users. Additionally, I address the value of an ethical framework for water management by concluding that an ethical paradigm promotes a legal pluralist view of water resource management. Understanding the value of legal pluralism contributes to the development of equitable water policy reforms and minimizes future conflicts and struggles.

Following in Chapter IV, I examine the legal provisions of Chile's Water Code. I begin the chapter with the historical and political events that led to the 1981 Water Code, after which I discuss the laws set forth under the Water Code. Chapter V provides empirical evidence in the form of case studies from Chile to illustrate that the Water Code has disparate impacts and that climate change will exacerbate these ethical

problems. While enlightening, these case studies are discouraging as they illustrate how water resource management impacts disadvantaged groups. However, the recent Chilean Supreme Court decision granting the Aymara communities water rights offers a glimmer of optimism for a more ethical approach to water management. Drawing upon the legal analysis and case studies from the prior two chapters, Chapter VI highlights several prominent ethical concerns in the Chilean model that focus on specific legal provisions. Finally in Chapter VII, I analyze the broader principles of water laws that function as barriers to achieving an ethical management of freshwater resources. This chapter contributes to constructing ethical environmental policies that will alleviate current and future water inequities.

There is considerable value to this research. First, this is a unique project: no research to date has analyzed the ethical implications of legal water provisions. Thus, this thesis provides a preliminary framework on how to examine the ethical dilemmas embedded in legal provisions. Second, this thesis contributes to the continual development of water ethics as a discourse. Third, this research identifies ethically problematic legal provisions that future water policy reforms should avoid. And lastly, this research draws analogies between Chile's market-based system and the influence climate change will have on the possible development of an international water market, and thus the critiques of a prescriptive approach to water management are applicable to the privatization and globalization of water resources as well.

CHAPTER II

CLIMATE CHANGE: THE IMPACT ON FRESHWATER RESOURCES AND THE INEQUITABLE IMPACT ON SOCIAL SYSTEMS

Climate Change

Climate change may very well be the factor that catapults the world into a water crisis. Even in the absence of climate change, the demands for freshwater resources are complex, often contend with one another, and demands are increasing as population grows. Every day users and governments struggle to solve water needs and problems. Solutions though, often address immediate concerns and do not consider how climate change will alter hydrological conditions. Without considering the impacts of climate change, effective water resource management will be destabilized. To date, the typical response to climate change has been the wait-and-see approach while the response to water shortages has been to develop supply infrastructure such as reservoirs or desalinifaction plants, with less focus on the demand side of the equation.[8] With less water available and the additional stress of climate change on hydrological systems, communities and governments need to reconceptualize how to manage water, particularly in regions where supply development is not a feasible option.

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[8] Jordan A. Clayton, *Market-Driven Solutions to Economic, Environmental, and Social Issues Related to Water Management in the Western USA*, 1 WATER 19, 21 (2009) (stating that the development of supply infrastructure has been the U.S. response to water shortages).

The fundamental problem in developing policies to manage water resources that account for climate change is that future hydrological changes will be unpredictable:

> The scientific models available to forecast the range of possible hydrological impacts of climate change are relatively less certain than those designed to forecast changes in global temperatures over time...There is significant agreement among a large number of models that those changes will be significant, but more uncertainty about the exact nature, timing, and magnitude of those changes.[9]

Likewise, it is difficult to accurately predict how bodies of water will respond to a change in precipitation since catchment responses depend upon complex "physiogeographical and hydrogeological characteristics and the amount of lake or groundwater storage in the catchment."[10] This uncertainty runs counter to the qualities of effective water resource management which include stability, reliability, and predictability. Another scientific underpinning of water resource planning threatened by climate change is the concept of stationarity.[11] Stationarity is the idea "that natural systems fluctuate within an unchanging envelope of variability."[12] Water laws and water management models are designed to cope with the natural fluctuation in climate and hydrology so long as fluctuations occur within the predicted stationarity. Because of global hydrological

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[9] Robert W. Adler, *Climate Change and the Hegemony of State Water Law*, 29 STAN. ENVTL. L.J. 1, 10 (2010). *See also*, Edwin P. Maurer, *Uncertainty in Hydrologic Impacts of Climate Change in the Sierra Nevada, California Under Two Emission Scenarios*, 82 CLIMATE CHANGE 309, 310 (2007); Guiling Wang, *Agricultural Drought in a Future Climate: Results from Fifteen Global Climate Models Participating in the IPCC Fourth Assessment*, 25 CLIMATE DYNAMICS 739, 740 (2005); BRIAN DAWSON & MATT SPANNAGLE, THE COMPLETE GUIDE TO CLIMATE CHANGE 392 (2009).

[10] Zbigniew W. Kundzewicz et al., *Freshwater Resources and Their Management, in* CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY OF WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, 177 (M. L. Parry et al. eds., 2007). [hereinafter IPCC].

[11] P.C.D. Milly et al., *Stationary Is Dead: Whither Water Management?*, 319 SCI. 573, 537 (2008).

[12] *Id.*

changes, some scientists have declared that "[s]tationarity is dead and should no longer serve as a central, default assumption in water-resource risk assessment and planning."[13]

Another challenge in reforming water laws to account for climate change and manage the resource ethically is that water policies must translate scientific knowledge into functioning regulations and policies. This will require lawmakers to translate unpredictable future climatic patterns into policy. While this legislative process will be complex, the basic science behind climate change, however, is not complicated. Earth experiences natural oscillations between warm and cool periods, yet earth's surface temperature is increasing at a rate that scientists cannot explain by these natural cycles. Over the past half-century, temperatures have probably been "the highest of any 50-year period for the past 1,300 years."[14] Scientists have linked this increase in temperature to an increase in atmospheric concentrations of carbon dioxide (CO_2) and other greenhouse gases.[15] Up until the beginning of the industrial revolution, the earth maintained a level of 280 parts per million (ppm) of CO_2 in the atmosphere.[16] Today, CO_2 levels have reached 380 ppm.[17] Greenhouse gases, when not at elevated levels, naturally increase

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[13] *Id.*

[14] UNITED NATIONS DEVELOPMENT DEPARTMENT, HUMAN DEVELOPMENT REPORT 2007/2008: FIGHTING CLIMATE CHANGE: HUMAN SOLIDARITY IN A DIVIDED WORLD 31 (2007), *available at*: http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf.

[15] Greenhouse gases include carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), and synthetic fluorinated gases like hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Climate Change – Greenhouse Gas Emissions, http://www.epa.gov/climatechange/emissions/ (last visited May 1, 2010).

[16] ROBERT TRAER, DOING ENVIRONMENTAL ETHICS 258 (2009).

[17] Climate Change – Science State of Knowledge, http://www.epa.gov/climatechange/science/stateofknowledge.html (last visited May 1, 2010).

earth's temperature and create a habitable climate. Increased levels of CO_2 and other greenhouse gases trap energy from the sun that is not absorbed by the earth, energy that would have otherwise radiated back into space. With an increased concentration of greenhouse gases in the atmosphere, more solar radiation is captured which in turn elevates earth's temperature and results in an enhanced greenhouse effect.

While the production of greenhouse gases and the resulting greenhouse effect are naturally occurring, today's unprecedented current warming period is caused by an increase in anthropogenic greenhouse gas emissions, specifically CO_2. Humans have substantially increased the amount of greenhouse gases in the atmosphere by burning fossil fuels, by changing land uses, such as deforestation and urbanization, and other activities.[18] Unfortunately, reversing the warming trend is not as simple as reducing our emission habitats. Carbon, once emitted into the atmosphere, remains there for several centuries.[19]

Furthermore, humans have crippled the ecosystem's natural ability to eliminate carbon from the atmosphere. The ecosystem regulates the earth's carbon by absorbing and releasing CO_2, which is emitted into the atmosphere by a variety of means, whether anthropogenic or naturally occurring emissions. Earth's "carbon sinks," such as soil, vegetation, rocks, and oceans, absorb CO_2. With CO_2 levels now at 380 ppm, earth's carbon sinks are being overwhelmed. As a result, carbon sinks are absorbing more

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[18] *See,* James Hansen et al., *Targeting Atmospheric CO_2: Where Should Humanity Aim?*, 7 THE OPEN ATMOSPHERIC SCI. J. 217, 222 (2008); UNITED NATIONS DEVELOPMENT DEPARTMENT, *supra* note 14, at 56; TRAER, *supra* note 16, at 258-59.

[19] Hansen, *supra* note 18, at 11.

carbon, which has serious ecological impacts for the sinks and diminishes their capacity to absorb future CO_2. Carbon loading the sinks leads to their destruction through a negative feedback loop: the more CO_2 emitted into the atmosphere, the less the earth can absorb, leading to increased CO_2 levels and higher global temperatures, which further reduces earth's ability to absorb CO_2.

A challenge in addressing climate change and one that is also true for diminishing water resources is that they are compounding problems. Climate change is driven by a number of factors, including population and economic growth, energy demands, social change, and technological innovations.[20] As societies continue to grow and develop, they consume more goods, energy, and resources, which in turn increases anthropogenic emissions and ultimately impacts hydrological patterns as global temperatures rise. When societies expand, demands for water also increases. Yet water resources are and will continue to become scarcer because of climate change. Sadly, this is a cycle that shows no evidence of abatement and has become such an extensive problem that only comprehensive reforms across the fields of development and natural resource management can effectively decelerate this cycle.

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[20] Just as climate change is driven by economic activities, so too is water consumption. Take for example agriculture. "Water consumption generally increases with income and the level of economic activity – as economies grow, they usually use more water." DAWSON, *supra* note 9, at 396.

Impacts on Hydrological Systems

The significant impacts climate change will have on the global hydrological cycle must be accounted for in policies governing freshwater resources.[21] Anticipated impacts include, "variations in the distribution, timing, and intensity of precipitation events...and changes in the timing of seasonal water flows,"[22] which in turn will effect the quality and quantity of freshwater resources. Temperature is a key determinate in predicting precipitation as the ability of air to retain water increases with temperature.[23] As global temperatures rise, the air will retain a higher amount of moisture, which increases the amount of precipitation.[24] Scientists project "a potential 2.3°C (36.5°F) average temperature increase and a resulting 5.2 percent average increase in precipitation by the middle of this century."[25] Not only will higher temperatures accelerate the hydrological cycle by altering the atmosphere's ability to retain water, but warmer temperatures will also increase the rate of evaporation[26] and more precipitation will fall as rain rather than snow.[27]

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[21] This thesis only summarizes some of the many hydrological impacts of climate change. For more information on the wider scope of climate change impacts on water resources, *see, e.g.*, IPCC, *supra* note 10.

[22] DAWSON, *supra* note 9, at 392.

[23] *Id.* at 10.

[24] Scientists predict that for every "1 degree Celsius rise in earth's mean surface temperature, global precipitation is expected to increase by 1%." *Id.* at 394.

[25] Adler, *supra* note 9, at 11; Syukuro Manabe et al., *Simulated Long-Term Changes in River Discharge and Soil Moisture Due to Global Warming*, 49 HYDROLOGICAL SCI. 625, 628, 631 (2004).

[26] IPCC, *supra* note 10, at 176.

[27] Helen Ingram, David Feldman & John M. Whitely, *Water and Equity in a Chaning Climate, in* WATER, PLACE, AND EQUITY 272 (John M. Whiteley et al. eds., 2008).

However, increased precipitation will not be evenly distributed.[28] Instead, climate change will increase the global aggregate of precipitation, meaning that changes will occur regionally with some areas experiencing increased rainfall while other areas may remain unchanged, and yet others may become drier.[29] In regions of anticipated heavier precipitation, an increase in rain may lead to more floods which "can strain the capacity of existing dams and flood control facilities, [] lead to loss of life, disolocat[e]...large populations, and [lead to] extensive damage to property and other economic resources."[30] In regions where less rainfall is anticipated, increased temperatures will lead to higher rates of evaporation thereby increasing aridity in many areas.[31] In arid climates water is less capable of recharging underground aquifers and running off into rivers and streams, which creates problems with water catchment. Thus, water shortages will be exacerbated in these already parched environments. Additionally, "[i]f temperatures continue to increase, arid regions are expected to expand, increasing the size of some of the world's largest deserts."[32]

Climate change will alter seasonal water flows of mountain glaciers. At first, snowmelts will result in an increased flow rate, but once the glaciers and snow packs

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[28] GLOBAL WATER PARTNERSHIP, CLIMATE CHANGE ADAPTATION AND INTEGRATED WATER MANAGEMENT – AN INITIAL OVERVIEW 2 (2007).

[29] Adler, *supra* note 9, at 12 (stating "available models project that we portions of the globe are likely to get wetter and that arid portions of the globe are likely to get even drier and to expand in size.").

[30] *Id.* at 11.

[31] GLOBAL WATER PARTNERSHIP, *supra* note 28, at 4; Ingram, *supra* note 27, at 272.

[32] Adler, *supra* note 9, at 11.

disappear, flows will diminish during the dry summer months when glacial runoff recharges groundwater and river systems.[33] This runoff is a critical source not only to recharge hydrological systems but also for humans, industry, and nature alike. The Technical Committee for Global Water Partnership stated in a policy brief that "[t]he reduction in runoff will be perhaps the most serious impact of global warming on the water environment"[34] because glacial systems serve as natural reservoirs, storing water in colder months and slowly releasing water during warmer months. To illustrate how serious this concern is, the Intergovernmental Panel on Climate Change (IPCC) estimates that one-sixth of the world's population lives in river basins fed by glacier or snowmelts.[35] When these sources of water dry up, at least one-sixth of the world's population, or maybe even more, will be without water sources.

Although this thesis does not focus on issues surrounding water quality, it is important to note that climate change will impact water quality just as it will affect water quantity. Even though increased temperatures will lead to more precipitation, this additional rainfall will not result in more potable water. To the contrary, degraded water quality will intensify water scarcity. Water degradation occurs in a number of ways, one being an increase in water temperatures. Warmer atmospheric temperatures generate warmer water. Warmer water contains less oxygen, a critical component in water for

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[33] DAWSON, *supra* note 9, at 395.

[34] GLOBAL WATER PARTNERSHIP, *supra* note 28, at 4.

[35] IPCC, *supra* note 10, at 175.

biodegradation,[36] biota development, and other ecological processes that allow water to self-purify.[37] In regions where aridity does not impede runoff, more precipitation will increase runoff into water bodies, although this will carry with it contaminants, toxins, and other pollutants. In regions where there is less precipitation and runoff, water will have a higher concentration of contaminants because there will be less water to dilute these pollutants.

Even though the debate about climate change was considered over following Hurricane Katrina and the 2007 publications by the Intergovernmental Panel on Climate Change, climate change literature continues to be written in the future tense since the range of impacts have not fully materialized yet.[38] Nevertheless, we only need to look to the Himalayas to observe the impact of climate change on water needs. *Time* magazine recently ran an article highlighting the severity of the receding Himalayan glaciers, a story that offers readers a glimpse into the future global problems of water scarcity we will face because of climate change.[39] The high altitude glaciers of the Himalayas function as "the water tower of Asia" because snowmelt from these glaciers feed some of the world's "mightiest river systems" and is the source of water for 3 billion people, half

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[36] "Biodegradation is nature's way of recycling wastes, or breaking down organic matter into nutrients that can be used by other organisms." Environmental Inquiry, http://ei.cornell.edu/biodeg/ (last visited May 1, 2010).

[37] IPCC, *supra* note 10, at 178.

[38] The Distracting Debate Over Climate Certainty, http://dotearth.blogs.nytimes.com (Feb. 10, 2010, 11:36 EST) (stating the debate over climate change certainty is over). For an example of climate change literature discussing impacts in the future tense, *see* UNITED NATIONS DEVELOPMENT DEPARTMENT, *supra* note 14, at 107 (stating "[t]he consequences [of climate change] will be reflected in surging inequalities within and across countries and rising poverty.").

[39] *See* Bryan Walsh, *A River Rant Through It*, TIME, Dec. 14, 2009.

the world's population.[40] However, rising temperatures is causing the Himalayan glaciers to melt quickly, widening [the] gap between water supplies and needs.[41] While societies face various problems due to this water stress, the real debate concerns the question of survival. Even though these changes are happening in the Himalayas, they carry a real potential for both national and international conflict.[42]

Inequitable Impacts on Social Systems

If this thesis was only about constructing a legal framework to best respond to the climate change challenges discussed above, I would proceed from here to make policy reform suggestions. I would discuss how legal models need to be more flexible in order to allow water transfers and how models need to incentivize greater conservation. However, that is not what this thesis concerns as these recommendations have already been made. What does concern this thesis is the missing human element in these reforms. As Frances Beinecke, President of the Natural Resource Defense Council stated, "[climate change] isn't an environmental problem. It's a humanitarian problem global in scope."[43] Interjecting the human element into natural resource management policies while accounting for climate change requires ethical considerations in order to meet and protect society's needs for water.

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[40] *Id.* at 58.

[41] *Id.*

[42] *Id.* at 62.

[43] *Id.* at 63 (quoting President of Natural Resource Defense Council Frances Beinecke).

With climate change, ethical issues arise in two ways: (1) who is impacted the most by climate change, and (2) how humans choose to respond to climate change.[44] Just focusing on the second point, the best means of contextualizing the inequities of climate change is to point to Hurricane Katrina, which devastated New Orleans in 2005. While this example may seem obvious and trite now from overuse, the tragedy truly epitomizes how a community's social inequalities is a predisposition to climate change vulnerability in that Katrina impacted individuals differently along racial and socioeconomic lines.[45] However, race and wealth are only two factors that create a predisposition for climate change vulnerability. There is ample literature identifying what segments of the world's population will feel the greatest impacts of climate change.[46] Gender, reliance on climate-sensitive resources, age (the young and the old), marginalized groups, and the poor are considered to be the most vulnerable to climate change.[47] These are the same communities that are already affected by inadequate water resources and that will be affected further when climate change renders water scarcer. Reforming water resource

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[44] "How we as individuals should act in the face of the rapid anthropogenic environmental change that are now sweeping the globe with disastrous consequences for many of our contemporaries, future generations, and nonhuman nature is one of the most interesting and important ethical issues that climate change confronts us. But just as important are the ethical questions that underlie our collective responses to climate change." Dale Jamieson, *Climate Change and Global Environmental Justice*, *in* CHANGING THE ATMOSPHERE: EXPERT KNOWLEDGE AND GLOBAL ENVIRONMENTAL GOVERNANCE 291 (P. Edwards et al. eds., 2001).

[45] The hurricane destroyed two of the poorest communities of New Orleans where the victims of those neighborhoods were 75% African Americans, a population that has three times the poverty rate of whites. UNITED NATIONS DEVELOPMENT DEPARTMENT, *supra* note 14, at 81.

[46] *See, e.g.,* UNITED NATIONS DEVELOPMENT DEPARTMENT, *supra* note 14; UNESCO, WATER IN A CHANGING WORLD (2009); MARIE-JOËLLE FLUET, LUC VESCOVI & AMADOU IDRISSA BOKOYE, WATER AND CLIMATE CHANGE: CITIZEN MOBILIZATION, A SOURCE OF SOLUTIONS (2009).

[47] FLUET, *supra* note 46, at 74.

management is only one part of a larger process needed to adapt to climate change, but a very important process nonetheless. Using an ethical framework to reform water resource management is a means of climate change adaptation that avoids reinforcing social or cultural inequalities.

Implications for Law and Policy

The impacts climate change will have on water resources and human populations prompt legal systems to respond proactively. This means changing the underlying models based upon stationarity, stability, and predictability that are used in water resource planning. Law Professor Robert Adler from the University of Utah warns, "legal systems designed mainly to promote stability rather than to respond to rapid change, [changing to new water laws and policies]...will not be easy."[48] Water resource management needs to be governed by laws and policies that enable flexibility so that water can be redistributed as needed. But an ethical framework would ensure flexibility be countered by equity so that water is not forcibly taken away from marginalized users and given to wealthier and more powerful users. New laws must permit the redistribution of water on multiple scales (e.g. regional, national, and international) in order to minimize human suffering and conflict. Indeed, one option to promote flexibility is to create water markets such as those operating in Chile. This solution, however, is incapable of accounting for the social, cultural, and environmental price of water. To

[48] Adler, *supra* note 9, at 7.

ensure any water policy reforms consider these values, an ethical framework must be incorporated into climate change policies.

CHAPTER III

WATER ETHICS: TRANSLATING THE VALUES EMBEDDED IN FRESHWATER RESOURCES INTO AN ETHICAL FRAMEWORK

Any student, scholar, or practitioner working in the water resource field has undoubtedly heard the saying, "[w]hiskey is for drinking; water is for fighting over."[49] A hackneyed quote, but nevertheless one that emphasizes the intrinsic, indisputable, and universal value of water: water is invaluable because all life is dependent upon water. Because water is as valuable as life itself, control over water is power. Despite the immeasurable value of water, humans are straining water resources through development, population growth, and now water resources are threatened by climate change. And as the previous chapter discussed, climate change will have disparate impacts upon disadvantaged and marginalized segments of society. These factors taken together – the growing demand, increasing scarcity, and high inequity -- are a guaranteed formula for conflict and political, social, and economic instability. Avoiding such a disaster requires water policy reforms to shift the current water resource management practices away from unrestricted growth and inefficiencies, towards a process that allows those with little or no voice to participate and have a stake in the political processes. Managing water using

[49] Although unverified, this quote is usually attributed to Mark Twain. *See, e.g.*, Mark Twain Quotations, Newspaper Collections, & Related Resources, http://www.twainquotes.com/Water.html (last visited April 17, 2010).

an ethical framework is a means of avoiding the impending disaster climate change will have on hydrological and social systems.

The concept of water ethics will help communities, agencies, and governments reconceptualize water policy reforms to address the conflicting water needs of society. This chapter defines water ethics, summarizes the progress of water ethics scholarship today, and examines the value of using an ethical framework to reform natural resource management. My concept of an ethical framework deviates from those policies recommended in current literature.[50] For instance, the topic of water ethics is being discussed as a set of universal policies. I disagree with this approach and have found only one piece of literature supporting my proposition.[51] Few scholars challenge the notion of a universal water ethic because they fail to recognize the meanings embedded in water resources. This chapter discusses the various imbedded cultural values in water to illustrate the complexity of creating a universal ethical paradigm and also the inherent risk that a universal paradigm will homogenize the cultural differences in relation to water. Ultimately, this chapter seeks to advance the argument that an ethical framework is a tool that can minimize conflict over water resources in a changing climate.

Water is a precious resource, and before engaging in any meaningful critique about water ethics, the diverse values of water must be discussed. When scholars discuss the value of water, they generally use one or both of the following arguments. The first

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[50] *See, e.g.*, Gabriel Eckstein, *Precious, Worthless, or Immeasurable: The Value and Ethic of Water*, 963 TEX. TECH L. REV 38, 967 (2005); Janos J. Bogardi, *Water Disasters and Ethics*, *in* WATER ETHICS: MARCELINO BOTÍN WATER FORUM 315 (M. Ramón Llamas et al. eds., 2009).

[51] *See* Helen Ingram, David Feldman & John M. Whitely, *Water and Equity in a Changing Climate*, *in* WATER, PLACE, AND EQUITY 277 (John M. Whiteley et al. eds., 2008) (explaining that the nature of water helps "explain the failure of attempts ton construct mutually consistent principles of water ethics.").

and most often used rationale highlights the unique nature of water. Water automatically has value since it has "life giving and sustaining capabilities."[52] Moreover, from a utilitarian perspective, water is valued for the countless ways it touches our lives: recreation, navigation, energy, agriculture, industry, and the list goes on and on. The second but less common way the value of water is discussed is to conceptualize water as an extension of cultural identities, an approach that is more often used by social scientists then lawyers or government agents. This perspective frames water as "a 'hybrid' thing that captures and embodies processes that are simultaneously material, discursive and symbolic."[53] Under this concept, the value of water is financially immeasurable as value is derived from social, cultural, and historical customs.

The values ascribed to water ultimately depend on who is doing the assessment. Assessments can be performed by individuals or collectively, such as by a community, state, or nation. "Factors that can influence how water is perceived, and therefore valued, may include: perspectives on life and the value of life itself; social and economic ideals; cultural, religious, and societal backgrounds and proclivities; and even politics."[54] Values are often conflicting. Even where water is managed under a single management scheme and thus one set of values is imposed upon diverse populations, water continues to carry different importance for users that defy a single framework. Take for instance how the different stakeholders value water in the Klamath Basin. In 2001, the U.S.

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[52] Amy Hardberger, *Whose Job Is It Anyway?: Governmental Obligations Created by the Human Right to Water*, 41 TEX. INT'L L.J. 533, 534 (2006).

[53] ERIK SWYNDGEDOUW, SOCIAL POWER AND THE URBANIZATION OF WATER: FLOWS OF POWER 28 (2004).

[54] Eckstein, *supra* note 50, at 965.

Bureau of Reclamation shut off water fed through the Klamath Reclamation Project, a federal irrigation project. As the water source dried up, diverse water culture norms were magnified between the various stakeholders including "farmers, fishing communities, environmentalist, and Indians."[55] Ultimately, the lack of sufficient water resources in addition to competing water values led to conflict, or to what some legal scholars called, "the clash of cultures."[56]

An agreed upon set of water ethics does not exist because of the nature of water, a nature that is either physically or socially constructed, is multifaceted and highly complex. Thus any reference to "water ethics" is really a reference to the broader concept of ethics, which is influenced by the beholder's set of personal and cultural values and is then applied to water resource management. Ethics, a branch of philosophy based on morality, "looks at the meaning...of statements about the rightness or wrongness of actions; at motives; at blame; and fundamentally at the notion of good or bad."[57] How we, as humans, interact and behave is internally regulated by our sense of ethics. Ethics not only regulates human relations, but also human relations with the

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[55] Holly Doremus & Dan A. Tarlock, *Fish, Farms, and the Clash of Cultures in the Klamath Basin*, 30 ECOLOGY L.Q. 279, 287 (2003).

[56] *Id.*

[57] Magdy A. Hefny, *Water Management Ethics in the Framework of Environmental and General Ethics: The Case of Islamic Water Ethics*, *in* WATER ETHICS: MARCELINO BOTÍN WATER FORUM 26 (M. Ramón Llamas et al. eds., 2009) (quoting Eric Katz, *Ethics and Philosophy of the Environment: A Brief Review of the Major Literature*, 15 ENVTL. HIST. REV. 79 (1991)). Ethics has also been defined as "codes of conduct or prime directives that aid us in determining whether something is right or wrong, good or bad." Eckstein, *supra* note 50, at 967. Likewise, Harremoës defines ethics as a "socially accepted moral standard as to what you can do and what you cannot do (behaviour ethics) and/or a standard as what damage, pain, loss, poverty, thirst, etc. can be inflicted upon your follow human beings (consequence ethics)." Poul Harremoës, *Water Ethics – A Substitute for Over-Regulation of a Scarce Resource*, 45 WATER SCI. & TECH. 113, 118 (2002).

environment.[58] However, "[e]thics has a relative meaning and it differs from one culture to the other and one person to the other."[59] Likewise, water ethics has a relative meaning, which is the reason why no comprehensive definition of water ethics exists. In the book *Water, Place, and Equity*, Helen Ingram similarly reasons the conflicting meaning of water precludes a universal concept of water ethics:

> Water can be and often is tied to place, or it can be a disembedded symbol or idea. It can be bound up with security. It can be the focal point of community and culture building. It can take on an essentialist character as a gift of nature. Or, it can be an artifact of the human imagination as a matter of taste or lifestyle that may be virtual or artificial. Many of these and other meaning are not commensurable and simply cannot be ordered into any kind of priority that simplifies social choices. The multiple and conflicting meanings of water underlie the contemporary conflicts over the role of markets, human rights, geographically basin river-basin and watershed institutions, and participation-based processes of inclusive governance. They also help to explain the failure of attempts to construct mutually consistent principles of water ethics.[60]

A second but subsidiary reason why no agreed upon definition of water ethics exists is because water ethics scholarship is still in its infancy.[61] Much of the literature written on this subject fails to recognize that ethics, and therefore water ethics, are "profoundly influenced by societal norms and belief."[62] Failure to acknowledge this fundamental concept of water ethics consequently has led to literature promoting water management policies that are completely detached from the geography, history, and

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[58] Harremoës, *supra* note57, at 117.

[59] Hefny, *supra* note 57, at 27.

[60] Ingram, *supra* note 51, ar 277.

[61] Muhammand Mizanura Rahaman & Olli Varis, *The Ethical Perspective of Water: Dilemmas and Future Challenges*, in SUSTAINABLE DEVELOPMENT OF ENERGY, WATER AND ENVIRONMENTAL SYSTEMS 1 (Naim H. Afgan et al. eds., 2005).

[62] Eckstein, *supra* note 50, at 968.

culture of societies. For instance, the International Conference on Water and The Environment held in Dublin in 1992 created four guiding principles to "ethical" management, referred to as the Dublin Principles.[63] The fourth principle reads, "[w]ater has an economic value in all its competing uses and should be recognized as an economic good."[64] Yet, not all cultures would agree with this principle. For instance, framing water as an economic good affronts the Islamic conceptualization of water as a free gift from God.[65]

By disregarding the discursive, symbolic, and cultural values of water, water ethics is able to construct a universal ethic, a "consistent principles of water ethics" to use Ingram's language.[66] One example of an attempt to construct a universal ethic are the Dublin Principles, which proposed a management of water using western values to cultures that do not conceive of water in the same manner. Pushing a universal ethic from one paradigm, such as a western perspective, in order to reform water policies runs the risk of homogenizing cultural values embedded in water. A handful of water ethics literature is struggling to find common values of water between various cultures, believing "common water ethics…could serve as a starting point for enhancing water resource management."[67] This is a dangerous and implausible venture.

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[63] *See* International Conference on Water and Environment, The Dublin Statement on Water and Sustainable Development, Dublin, Ir. 1992 [hereinafter Dublin Principles].

[64] *Id.*

[65] Eckstein, *supra* note 50, at 968; Harremoës, *supra* note 57, at 4-5.

[66] Ingram, *supra* note 51, at 277.

[67] Eckstein, *supra* note 50, at 970.

Even with that said, I am willing to concede that this body of literature has identified one universal principle. That principle is the humans right to clean and sufficient water.[68] From this ethic emerges a water management goal that believes "[w]e should restore and maintain the integrity of the nation's waters, because we have a duty to care for the ecosystems that sustain life on earth, protect the human right to clean...water, and preserve these ecosystem functions for future generations."[69]

With the exception of this one principle, this thesis deviates from the body of literature searching for a universal ethic. Aside from the few overarching truths about water resources – all life depends on water and thus the need and demand for water will always be present – this thesis takes the position that there cannot be a singular, universal water ethic. Like the values and uses of water resources, ethics is a social and cultural construct that cannot be reproduced on a global scale. Consequently, this thesis proposes that the best way to construct an ethical framework for water management is to determine how a community or culture values water. Identifying the needs of disadvantaged communities and then exploring why these needs exist will be the basis of a water ethics framework in this thesis.

There must be value in reconceptualizing water management under an ethical paradigm, otherwise much literature, including this thesis, serves no purpose. Managing water resources using an ethical framework can be easily criticized in a variety of ways.

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[68] *See id.* at 969; *see also*, ROBERT TRAER, DOING ENVIRONMENTAL ETHICS 196 (2009). *But cf.,* Another Bad Idea Which We Need to Act On, http://www.globalwaterintel.com/insight/another-bad-idea-which-we-need-act.html (last visited May 1, 2010) (arguing that a human right to water is a bad idea).

[69] TRAER, *supra* note 68, at 196.

First, ethics is an impractical concept to engineer human behavior in regards to natural resource management. Ethics evolved without consideration for the environment,[70] and thus, ethics and resource management are incompatible discourses. Second, an ethical management of water resources may not be feasible. A perspective that favors water ethics argues that an ethical framework is a practical tool to examine the hydrological system in a holistic manner.[71] Such a perspective means that a central principle in water ethics is to conserve and allocate water in a way that meets the needs of all systems and beings dependent upon water.[72] Yet, the growing demand for water in addition water scarcity caused by climate change questions the practicality of meeting all water needs. If water availability enters into a crisis phase and certain water uses need to be eliminated in order to conserve other more valuable uses, an ethical framework may not dictate the triage of uses that will be necessary. A third argument related to the problem of practicality is that constructing an ethical framework is a luxury since only nations with strong economic and social security have the resources to dedicate to creating and implementing ethical water policy reforms.

A water ethics framework can be defended against these criticisms. First, ethics and environmental governance are not as incompatible or as disjointed as one may believe. In fact, environmental laws are a politicized version of society's perception of

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[70] *Id.* at 4.

[71] Adrian Armstrong, *Viewpoint – Further Ideas Towards a Water Ethic*, 2 WATER ALTERNATIVES 138, 138-39 (2009).

[72] *Id.* at 139.

ethics in codified form. Take for example, the Endangered Species Act.[73] When enacted in 1973, U.S. legislators made a definitive ethical choice to protect endangered wildlife. Actions perceived by legislators as wrong, such as jeopardizing the existence of the species through federally funded development projects, are prohibited by the Act.[74] Environmental laws are the means to engineer human behavior regarding natural resource management.

Laws are not only ethical codes, but laws also function to motivate ethical conduct. Ethical standards need to be articulated as laws for individuals who believe in an ethical standard, but need the incentive from governing laws and regulation to behave in a manner consistent with that ethic. For instance, hazardous waste laws exist to protect public health and environmental well-being because waste can be toxic if not properly disposed of. Individuals may choose to comply with these laws because they agree with the ethical values promoted by these laws, that is dumping toxic waste is "bad," and would not improperly dispose of the waste even if the laws did not exist. A second group of actors may comply only because they fear criminal or financial liability imposed by the laws. A third group, despite legal repercussions, fails to comply at all. Environmental laws are significant for the second group who are individuals that may recognize dumping waste is "bad" but still consider improperly disposing of the waste. It is only because of the repercussions for their actions that these actors buy into the normalized ethical behavior.

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[73] 16 U.S.C. § 1531 et seq. (2010).

[74] *See, e.g., Tennessee Valley Authority v. Hill*, 437 U.S. 153 (1978) (blocking the construction of a federally funded dam to protect the habitat of the endangered snail darter).

As for the feasibility concern, water ethics is no more impractical for managing water resources then is a free-market system, religious law, or any other framework. If water ethics is properly constructed, there is no reason as to why water uses cannot be prioritized when water scarcity becomes a larger problem with climate change. The key to an ethical framework, however, is that each community prioritizes their water uses in order to respect cultural and social difference. An ethical framework does not determine what water norms should prevail in prioritization. Furthermore, an ethical framework can "address issues such as the allocation of limited water resources and its relationship to efficiency, productivity, valuation, as well as equity and social justice."[75] And lastly, managing water under an ethical framework should not be considered a luxury but rather a requisite to ensure society's longevity and stability. Governments and nations simply need to prioritize ethical water resource management just as sovereigns must already prioritize other legislative agendas. Additionally, sovereigns will need to reform water policies anyhow because climate change will disrupt the practicality and functionality of existing water laws, and consequently, requesting governments to also consider ethical dilemmas involving climate change and freshwater management when they reform water policies is not an unreasonable task.

The greatest value behind examining water ethics is that constructing an ethical framework to address global water ethics stands as an alternative paradigm to the current modes of natural resource management. Currently, water laws operate as a single governing normative authority, which is akin to ignoring the diverse values of water. The

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[75] Hefny, *supra* note 57, at 27.

consequence of this regime, in the face of climate change and water scarcity, is social and cultural conflict and instability. However, a truly ethical framework will prevent these concerns because an ethical framework is a paradigm that allows for the operation of multiple norms regarding water management. Managing freshwater resources under various legal and quasi-legal regimes allows for a more comprehensive conceptualization of water ethics because it legitimizes various social norms. Since we cannot ignore the diverse values embedded in water, managing water from a legally pluralistic model to address ethical resource management is the best approach. Legal pluralism as a "refers to the existence and interaction of different (usually state and nonstate) normative orders in the same sociopolitical space."[76] This notion of legal pluralism will become increasingly clear further in this thesis when Chile's water laws and distributive impacts are examined in case studies. Indeed, water ethics is about equity, human rights, preventing future conflict, and even a more efficient and holistic means to managing water, but it is also about cultural identity and the right to exist.

Managing water resources under a pluralistic framework rather then a more inclusive, universalistic framework looks very differently. Under an egalitarian universalistic framework that seeks to be more inclusive, the sovereign is the actor that decides who to include in the model and what water rights or values are legitimate. Such an approach risks erasing diversity and ultimately risks being hegemonic despite intentions to be egalitarian. Legal pluralism, on the other hand, does not "answer the

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[76] Rutgerd Boelens, Margreet Zwarteveen & Dik Roth, *Legal Complexity in the Analysis of Water Rights and Water Resource Management*, *in* LIQUID RELATIONS – CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 4-5 (Dik Roth et al. eds., 2005).

question of who gets to decide."[77] Rather, a pluralistic approach "help[s] create…shared social space, procedural mechanisms, institutions, and practices for managing hybridity."[78] The policy differences of the pluralistic model creates a scheme that promotes the goal of conservation and resource stewardship by investing personal responsibility into natural resource management. Even though Aldo Leopold did not discuss legal pluralism, his perspective very much resonates with the goals and objectives of water ethics and legal pluralism:

> We abuse the land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanized man, nor for us to reap from it the aesthetic harvest it is capable, under science, of contributing to culture. That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics. That land yields a cultural harvest is a fact long known but latterly often forgotten.[79]

Using Leopold's philosophy, I propose that investing responsibility to manage water resources in the hands of communities will lead to sound management decisions as that community will ultimately be responsible for and effected by wasteful management practices.

Arguably, a pluralist framework is not consistent with the goals of water conservation since a pluralist framework seems to promote the water needs and demands of all cultural norms. Yes, there are certain cultural norms that are inefficient. Toilets

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[77] Paul Schiff Berman, *Global Legal Pluralism*, 80 S. CAL. L. REV. 1155, 1165 (2007).

[78] *Id.* at 1193.

[79] ALDO LEOPOLD, A SAND COUNTY ALMANAC 6 (1949).

are perhaps the best example of a wasteful cultural norm.[80] There might also be cultural practices that are just as inefficient that need to done away with. The goal of water conservation is upheld under a pluralist framework though because the culture or community is able to adjust water needs within that setting without having to overcome great legal barriers. Just as common law is a legal tool that allows societies to organically adapt and change over time, so too is legal pluralism except the difference is that the community, rather then the sovereignty, decides that a change in water practices is appropriate or necessary.

In recognizing the complex, conflicting, and plural values of water in every community, this thesis proposes that legal pluralism is an alternative benefit of water ethics, a benefit that has been unrecognized by the existing water ethics literature. This perspective of water ethics generates water policies that not only respects diverse relationships between water and socio-cultural norms, but also accommodates the basic need for water. As it will become more evident further into this thesis, current water law models are ill equipped to address the ethical dilemmas that will arise from climate change because these models homogenize water values, thereby excluding certain populations and creating equity issues among these communities.

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[80] *See* ROBERT GLENNON, UNQUENCHABLE: AMERICA'S WATER CRISIS AND WHAT TO DO ABOUT IT 206 (2009).

CHAPTER IV

CHILEAN WATER LAW

History and Background

Chile's legal system follows a civil-law tradition.[81] There are fundamental differences between a civil law and a common law system, which ultimately influences what legal authority policymakers must analyze and how policymakers will reform water laws. In this chapter, I clarify where to locate water laws in a civil law system for those readers more familiar with legal research in a common law system and provide some basic guidance on the legislative reform process. A civil law system is "code based" and judges follow these legal rules rather then interpreting the law, as is the practice in common law jurisdictions. Consequently, this thesis will mostly analyze codes rather then judicial opinions and court cases, which would have been the approach had water laws originating from a common-law system been analyzed.

The Chilean legislature, which is called the National Congress, consists of a Senate and a Chamber of Deputies.[82] Laws passed by the National Congress follow a

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[81] Civil law, which originates from the Roman Empire, is a legal system that is code-based and the judges impose predetermined rules rather then interpret the law. JAMES G. APPLE & ROBERT P. DEYLING, A PRIMER ON THE CIVIL-LAW SYSTEM 1 (1995). For a brief history on the development of the civil law system in Chile, *see id.* at 16-18.

[82] *Essential Issues of the Chilean Legal System*, http://www.nyulawglobal.org/globalex/Chile.htm (last visited May 1, 2010).

hierarchical system of institutional acts, special acts, and then ordinary acts.[83] Within this latter category, a subcategory of laws exists that are called decree or delegated laws (D.F.L. or *Decreto con Fuerza de Ley*).[84] Delegated laws are legislated by the President of Chile through the delegated powers of Congress, the authority for which is constitutionally enumerated.[85] The Chilean Water Code is a delegated law. Even though delegated laws are created by Presidential decree, the executive branch cannot amend or repeal the law. Rather, in order to repeal or amend a delegated law, the legislative branch has to legislate a new statutory provision.[86] Although the Water Code is a delegated law and would seemingly follow this process of reform, amending the Water Code actually requires more. Given the close relationship between Chile's Constitution and the Water Code,[87] both legislative chambers of the National Congress would have to approve a

[83] This hierarchy denotes that different percentages of legislative approval are necessary to pass different types of law. *See id.*

[84] *Id.*

[85] The power of the President to legislate decrees with the force of law is enumerated in Article 61 of the Chilean Constitution. *See* CONST. CHILE art. 61. The Constitution prohibits the President from enacting D.F.L. relating to "nationality, citizenship, elections or plebiscite, [or] to matters covered by the constitutional guarantees or which must be a matter of the constitutional organic laws or of laws passed by a qualified quorum. The authorization may not include powers that affect the organization, powers and the legal system of the officers of the Judiciary, the National Congress, the Constitutional Court or the Office of the Comptroller General of the Republic." *Id.*

[86] Humberto Nogueira Alacalá, *La Delegación de Facultades Legislativas en el Ordenamiento Jurídico Chileno*, 2010, http://www.scielo.cl/scielo.php?pid=S0718-00122001000200005&script=sci_arttext (last visited May 1, 2010).

[87] *See* infra pp. 44-47 (discussing that the Constitution is the source of authority and model for Chile's Water Code).

statutory reform to the Water Code by a three-fifths vote.[88] This presents an obvious challenge to water policy reform in Chile.

Courts in civil law and common law countries share some similarities. For instance in Chile, the courts are independent from the executive and legislative branches of government.[89] The judicial system is a hierarchy divided into three tiers with the Supreme Court at the top, followed by Courts of Appeals, and then tribunals of first instances. Chile has two specialized courts – the Constitutional and Electoral Courts – which are independent of the Supreme Court's judicial reviews.[90] If water law cases are adjudicated in the judicial system, cases will first go before a judge sitting in a lower level civil court. Civil law and common law courts are different in that judges in civil law systems do not interpret Chilean law. Consequently, judicial opinions do not carry precedence and thus take on a different style then judicial opinions written in a common-law system. The judiciary instead functions to strictly enforce Chile's laws.[91]

Chile's freshwater resources are managed by three sources: the 1980 Chilean Constitution, the 1981 Water Code, and a handful of statutes supplementing the Water Code.[92] Before delving into a textual analysis of these sources, we must first take heed of

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[88] *Essential Issues of the Chilean Legal System*, *supra* note 82 (stating that "[l]aws that interpret the Constitution require approval from three-fifths of both legislative chamber.").

[89] *Id.*

[90] *Id.*

[91] Joe Mentor, *Trading Water, Trading Paces: Water Marketing in Chile and the Western United States*, AMERICAN WATER RESOURCE ASSOCIATION 3, http://www.awra.org/proceedings/dundee01/Documents/Mentor.pdf.

[92] *See, e.g.*, Norma de Emision Para la Regulacion de Contaminates Asociados a las Descargas de Residuos Liquidos a Aquas Marinas y Continentales Superficiales (Directo N° 90, 2001); Establece Norma de

Chile's political and economic history in order to comprehend fully how it came to be that Chile manages water under a free market system. Chile's Water Code is an example of what one scholar calls "the law of the pendulum," which is the tendency of laws to shift from one extreme to the other without ever settling on a middle ground.[93] One extreme of this pendulum was the 1967 Water Code, the code prior to the 1981 Water Code. Under this code, the Chilean government largely regulated and managed the nation's waters and prohibited private ownership of water rights. In reaction to big government and limited private rights, the pendulum swung in the opposite direction when the 1981 Water Code redefined water rights as private property and restrained the government's authority to regulate freshwater management. As evident from the little information provided about these two models, the Chilean Water Codes have been enumerated as a reaction to socio-political pressures rather than a model designed to coincide with hydrological realities, a fact alone that indicates the current code is not equipped to address the ethical challenges emanating from climate change.

The political indecisiveness over freshwater resource management began prior to the 1967 Water Code with Chile's first Water Code, which was enacted in 1951. The 1951 code was the closest model to balancing the private versus public water rights tension that has driven all subsequent water law reform. The 1951 model has been

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Emisión de Residuos Líquidos a Aguas Subterráneas (Directo N° 46, 2003); Crea la Comision Nacional de Riego (Ley N° 19.604, 1983); Reglamenta Procedimiento Para Aplicacion del D.F.L. 1.123/81, Sobre Ejecucion de Obras Riego por el Estado (Directo N° 285, 1995); Reglamento do los Servicios de Agua Destinados al Consumo Humano (Decreto N° 735, 2007).

[93] CARL J. BAUER, SIREN SONG: CHILEAN WATER LAW AS A MODEL FOR INTERNATIONAL REFORM 31 (2004).

analogized to the prior appropriation model of freshwater management, which is the model used in the western United States.[94] This version of the Water Code was heavily influenced by the prominent development theory of the 1950s, which promoted very active governments in order to stimulate economic development. Consequently, the government played a large role in managing water use under the 1951 Water Code. However, beginning in the 1950s and extending into the 1960s, Chile experienced high inflation and little economic growth. In an attempt to stabilize the country, particularly the agricultural sector, the government passed the Agrarian Reform Law of 1967 under the leadership of President Eduardo Frei Motalava.[95] This land redistribution scheme had profound impacts on Chile's management of freshwater resources since land reform requires the redistribution of water rights as well. Consequently, a new water code was enacted in 1967, which was a response to political and economic failures of the 1951 Water Code. Under the 1967 Water Code, all private ownership of water was eradicated, all of the nation's water was declared to be "national property for public use," and the government was given extensive regulatory power.[96]

There was then a dramatic political shift in the 1970s, which led to the pendulum swinging back in the opposite direction in the early 1980s. Chile, following the presidency of Frei, was a politically polarized nation. In 1970, Salvador Allende was elected president and proceeded to carry out his socialist platform and nationalized

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[94] BAUER, *supra* note 93, at 37.

[95] For more information on the agrarian reform under President Frei, *see* Joseph R. Thome, *Expropriation in Chile Under the Frei Agrarain Reform*, 19 AM. J. COMP. L. 489 (1971).

[96] BAUER, *supra* note 93, at 39-40.

Chile's natural resources.[97] His natural resources policies sparked domestic and international opposition from elites and international corporations because the policies aimed to improve life for the working class and failed to honor obligations made by the prior administration. Under Allende's policies, Chile's economy grew for a short period but then Chile plunged into a period of economic downturn, strikes, violence and militarization.[98]

In 1973, Chile became the stage for a battle over wealth, power, and control of natural resources when armed forces overthrew the government of Popular Unity and General Augusto Pinochet became Chile's President.[99] Under Pinochet's dictatorship, the military government began implementing neo-liberal economic policies that embraced development through unregulated free markets. These neo-liberal policies were implemented by a group of Chilean economists called the "Chicago Boys," a name given to the economists because they were trained at the University of Chicago.[100] The Chicago Boys' economic philosophy is best summarized by Milton Friedman, an American economist who taught at the University of Chicago and opposed the Keynesian economic model: "Chicago stands for belief in the efficacy of the free market as a means of organizing resources, for skepticism about government intervention into economic

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[97] David Carruthers, *Environmental Politics in Chile: Legacies of Dictatorship and Democracy*, 22 THIRD WORLD Q. 343, 344 (2001); MARK FALCOFF, MODERN CHILE 1970-1989: A CRITICAL HISTORY 181 (1989).

[98] Carruthers, *supra* note 97, at 345; FALCOFF, *supra* note 97, at 57-72.

[99] Carruthers, *supra* note 97, at 345. For more information discussing the role of natural resources and the involvement of the United States in Chile's political economy and political history, *see* FALCOFF, *supra* note 97.

[100] *See* BAUER, *supra* note 93, at 42.

affairs, and for the emphasis on the quality of money as a key factor in producing inflation."[101] It was this philosophy that influenced the Chicago Boys to structurally reform Chile's land and water rights.

Since land and water were expropriated during the 1960s, wherein the government took away individual private property rights, the Pinochet government had to redistribute water rights and land. Thus, beginning in 1975, the government distributed both land and water rights to privatize freshwater resources and establish tradable rights.[102] Even though national policies favored free markets and private property during the 1970s, the Chilean Water Code was not reformed until 1981. This delay in legal reform meant that the state-centered 1967 Water Code was in effect even after the country had shifted economic policies following Pinochet's military coup.[103] Consequently, the 1970s was a decade where legal rights were incompatible with the country's economic and political practices, which resulted in uncertain and insecure water rights that led to the continued muddled legal ownership of water to this day.

When the 1981 Water Code was enacted, the new model was a direct and strong reaction to the policies established by the 1967 Water Code. The 1981 code, analyzed in detail below, has as its underlying objectives the priorities of the Pinochet government.

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[101] JUAN GABRIEL VALDÉS, PINOCHET'S ECONOMISTS: THE CHICAGO SCHOOL IN CHILE 66 (1995) (quoting Milton Friedman).

[102] Mark W. Rosegrant & Renato Gazmuri S., *Reforming Water Allocation Policy Through Markets in Tradable Water Rights: Lessons From Chile, Mexico, and California*, 32 CUADERNOS DE ECONOMÍA 291, 299 (1995).

[103] BAUER, *supra* note 93, at 41.

As such, there were no ethical, hydrological[104] or ecological considerations, resulting in a code absent of these concepts. The Pinochet government perceived the 1967 Water Code as "statist and an obstacle for private investment not only in irrigation but also in mining and hydroelectric energy, the main source of electric energy in Chile."[105] Consequently, freshwater management was reformed "[f]irst, to clarify and stabilize the water rights situation within the agricultural sector, and second, to establish the legal framework to allow the free trading of water rights, both within agriculture and from one economic sector to another."[106] Generally speaking, these broad policy goals translated into a laissez faire framework for managing riparian basins using extensive private property rights and severely restricted government regulation.

What is dramatic and critical about the 1981 Water Code is that the reform represents a considerable departure from Chile's previous water policies. The 1981 code has been called "the most far-reaching neoliberal water reform policy"[107] and signals the first free market approach to water management. Implementation of this system was possible only because of the political dynamics occurring in Chile at the time:

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[104] I use the word "hydrological" in this sentence to capture that the Water Code does not conjunctively manage groundwater and surface water even though these two systems are hydrologically connected.

[105] Eduardo Zegarra, Water Market and Coordination Failures: The Case of the Limarí Valley in Chile 26 (July 2002) (unpublished Ph.D. dissertation, University of Wisconsin-Madison) (on file with author).

[106] BAUER, *supra* note 93, at 98.

[107] Rutgerd Boelens & Margreet Zwarteveen, *Anomalous Water Rights and the Politics of Normalization: Collective Water Control and Privatization Policies in the Andean Region*, *in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 107 (Dik Roth et al. eds., 2005).

> It is no coincidence that the most far-reaching neoliberal water reform policy, claiming individual freedom for all, was experimented with and implemented under the Pinochet regime, one of the most repressive dictatorships the Andean countries have ever known. Only this authoritarian and repressive regime was able to create the necessary conditions for making the model come true, by silencing and coercively controlling water user communities' voices of protest and acts of resistance.[108]

Minor amendments were made to the 1981 Water Code in 2005, but the code is still largely in effect despite the country's political shift back to a democracy in the 1990s.[109] Carl Bauer, an expert on Chile's water system, remarked that the 2005 reforms were not significant and instead were twelve years of work to "get a pretty limited result."[110]

Two important considerations for this thesis may be drawn from Chile's history of freshwater management. The first is that although certain aspects of the current water model established under a neoliberal regime are disengaged from democratic ideologies at force in Chile today, reforms have been difficult given the country's political makeup. The second is that Chilean water laws were created without any social or environmental considerations, thus climate change will likely have disparate impacts within these sectors.

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[108] *Id.*

[109] "The 2005 amendments were not a comprehensive reform of the 1981 Water Code. Rather the 2005 amendments "sought to correct earlier problems and to address social equity and environmental sustainability concerns that were largely absent form the 1981 legislation." Claus Aagaard & Helle Munk Ravnborg, *Water Reform – Implications for Rural Poor People's Access to Water*, DANISH INSTITUTE FOR INTERNATIONAL STUDIES, Sept. 20, 2006, http://www.diis.dk/sw25932.asp.

[110] Benjamin Witte, *A Candid Look at Chile's Controversial Water Market*, THE PATAGONIA TIMES, April 29, 2009, http://patagoniatimes.cl.

The Chilean Constitution

The Chilean Constitution is both the source of authority and the model for the 1981 Water Code. The Constitution was drafted by the Pinochet military regime during the 1970s "without public discussion or opposition, at a time when the absolute political control of the military was accompanied by the ideological ascendance of the government's neoliberal economists."[111] Like the 1981 Water Code, the 1980 Constitution is still largely in effect even though Chile transitioned back to a democracy in the 1990s.

There is much criticism, both Chilean and foreign, about the anti-democratic features of Chile's Constitution and the contradictions between democratic principles and authoritarian application.[112] However, there is very little criticism in regards to the Constitution's expansive private property rights, which is the cornerstone of Chile's free market water management system. The Constitution does not explicitly require a market economy, rather establishes the necessary procedural conditions in order to facilitate a functioning market economy.[113] For instance, the constitutional language establishes an expansive and absolute right in private property by stating that "[i]n no case may anyone be deprived of his property."[114] The Constitution then grants citizens the right to privately own water as property: "[t]he rights of private citizens over waters, recognized

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[111] BAUER, *supra* note 93, at 35.

[112] *See, e.g.*, Mark Ensalaco, *In With the New, Out with the Old? The Democratising Impact of Constitutional Reform in Chile*, 26 J. LATIN AM. STUD. 409 (1994).

[113] Carl J. Bauer, *Slippery Property Rights: Multiple Uses and the Neoliberal Model in Chile*, 38 NAT. RESOURCES J. 109, 114 (1998).

[114] CONST. CHILE art. 19, § 24.

or constituted in conformity with the law, shall grant proprietorship to the owners thereof."[115] Because a free market system requires a functioning process of exchanges, a water rights market cannot exist if buyers are unsure about a right because buyers will not choose to invest in an uncertain good. Thus, enumerating private property rights incentives exchange in the free market because secure ownership enables goods to be traded according to the highest bidder.

There is legal significance to enumerating water rights as private property within the Constitution rather than within legislation. Any reform to Chile's water rights would require a constitutional amendment, a very difficult process that requires broad political support.[116] Legislative reform on the other hand, albeit a process with its own set of barriers, does not match the hurdles required for constitutional reform.

Consequently, the 1980 Constitution has created an enduring legacy of strong private water rights that will hinder any reform focused on reestablishing greater public management of freshwater resources. Former Chilean President Michelle Bachelet

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[115] *Id.*

[116] The requirements to pass a constitutional amendment make the likelihood of constitutional reform unlikely.

> The Constitution may be totally or partially amended...[Chile's] Constitution is called a "rigid" one, based on the demanding proceeds to modify. The necessity of reform must be declared by Congress [sic] with the vote of at least two-thirds of the members, but it shall not be carried out except by an Assembly summoned to that effect. Amendments to the Constitution consist of changes to the constitutional text, of a large or small scope, making additions, deletions, or even alterations. The Constitution may be amended on the proposal of one of the members of the Chamber of Deputies or of the Senate, or the President of the Republic, depending of the matter. Such amendments must respect certain fundamental principles: direct, secret, universal, and periodic vote; individual rights and guarantees; and separation of powers. Approval requires two readings in each House of the National Congress, with three-fifths or two-thirds of the votes of the respective members.

Essential Issues of Chilean Legal System, *supra* note 82.

submitted a proposal to constitutionally reform Chile's Water code to Congress on January 6, 2010.[117] The proposal, which was presented as urgent, would have defined water as national property for public use and would also have established limits and obligations on water rights.[118] Both the private sector and right-wing politicians vehemently opposed the proposal and just three days before President Bachelet left office, the lower house removed the proposal's urgency status and an official from the Public Works Ministry subsequently announced constitutional water reforms would not be a priority in 2010.[119]

The 1981 Water Code

Ownership

One of the essential components of managing water resources is to define the ownership of water, which determines who ultimately has control over water resources. The question of ownership is different from the right to use water, which is the right to use water within a set of pre-established conditions. Cultural definitions of who owns

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[117] Eva Medalla, *Constitutional Reform to Update Water Code is Not a Priority*, BUS. NEWS AM., April 6, 2010, http://www.bnamericas.com/news/waterandwaste/Constitutional_reform_to_update_water_code_is_not_a_priority_-_MOP1.

[118] The proposal also would have made "water a national resource for public use and includes water in its liquid, solid – including glaciers and snow – and gaseous states." *Id.* I introduce this portion of the proposal as it likely had interesting reasons for being drafted, such as an attempt by the government to tightly regulate water sources as water resources availability diminishes.

[119] *Id.*

water varies widely, but generally speaking, legal ownership of water may be defined as "public, private, common, of nobody, or community."[120] Additionally, a legal regime might define water as a mix of these concepts since a system that is purely one type of ownership may fail in optimizing water usage and needs. Under a legal regime that manages water as a public good, water belongs to the state or can be held in trust by the state. Water rights, then, are usufructuary rights, wherein use by private individuals is allowed but the rights are not permanent or absolute and the state ultimately can recall the water right. Private ownership of water, on the other hand, is inalienable and individuals can own water and manage water in the same way that an individual may own or use private property.

Water in Chile can be privately owned, a right derived from the Constitution.[121] Although the Constitution is quite clear that water may be treated as private property, the 1981 Water Code contains contradicting language that describes water as public and national property even though water is treated as a private good. According to the 1981 Water Code, water is defined as *bienes nacionales de uso público*, or "national property for public use."[122] This language "dates back to the 1850s, when Chile adopted its Civil Code, which is still in effect."[123] When Chile's Civil Code was drafted in the 1850s, the code's primary author Andrés Bello drew [from] a number of sources…of which the

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[120] DANTE A. CAPONERA, PRINCIPLES OF WATER LAW AND ADMINISTRATION 138 (2007).

[121] *See* CONST. CHILE art. 19, § 24.

[122] Fija Texto del Codigo de Aguas, art. 5 (Decreto con Fuerza de Ley Número 1.122).

[123] CARL J. BAUER, *supra* note 93, at 37.

most prominent were Roman law (primarily from the *Corpus Juris Civilis*), Spanish law (including the *Codigo de Las Siete Partidas* and the glosses on that work by later Spanish jurists), the *Code Civil* of France, other European civil codes (including those of Prussia and Austria), and the treatises and scholarly writings of Spanish and French jurists."[124] The resulting concept of property law was one that frames property as a social function and a right that can be restricted by the state.[125] Although the civil-law idea of ownership is explicit in Chile's codes, the language is no more then a hangover from Chile's first Civil Code of 1857. To circumvent civil-law concepts of property, the government has enacted much legislation, "restricting the exercise of the right of property in such a way as almost to do away with the classic attributes of ownership set forth in the Civil Code."[126]

Consequently, even though the Water Code defines water as a "national property for public use" which sounds like a grant of public ownership over water, the code quickly curtails this interpretation of water as public property in the next provision, which states that the national government can grant private rights to water, a right called *derechos de aprovechamiento* or the "rights of advantageous use."[127]

Private ownership established by the Chilean Water Code creates an absolute and exclusive possession over water that is not part of other nation's legal or cultural

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[124] APPLE, *supra* note 81, at 17; *see also* Juan G. Matus Valencia, *The Centenary of the Chilean Civil Code*, 7 AM. J. COMPARATIVE L. 71, 76-77 (1958)(describing influences on Chilean Civil Code).

[125] Valencia, *supra* note 124, at 81.

[126] *Id.*

[127] *Id.* arts. 5 & 6; BAUER, *supra* note 93, at 32.

vocabulary. Private ownership creates a number of subsidiary rights as well, many of which may be perceived as significant or radical to those whose freshwater resource management policies derive from a socialist or ecocentric perspective. Contrast for instance, private ownership of water in the western United States to that of Chile. In the western United States, private rights are akin to an usufructuary right, which allows the owner enjoys the benefits of water ownership but the rights may be routinely changed, monitored, and limited. In Chile though, the owner yields unlimited rights and can use the water for any purpose.[128] Owners are free to alter the type or method of their water use without having to seek administrative or governmental approval first.[129]

This right includes the ability to "freely change the location and use of water rights without [governmental agency] approval."[130] Furthermore, an owner will not lose their right if the water is not effectively used.[131] Interestingly, this is provision is a unique characteristic of the Chilean water model as no other model in the world has this provision.[132] Likewise, owners do not relinquish portions of their water rights if other users benefit from unused portions of another's water right. Since not all water users will

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[128] "El que goza de un derecho de aprovechamiento puede hacer, a su costa, las obras indispensables para ejercitarlo." Fija Texto del Codigo de Aguas, art. 9 (Decreto con Fuerza de Ley Número 1.122); "El derecho de aprovechamiento es un derecho real." *Id.* art. 6 (describing the water right as a real right).

[129] BAUER, *supra* note (92), at 33. The one exception to this rule is if the owner is seeking to change the location of diversions from a natural channel.

[130] Bauer, *supra* note (107), at 121.

[131] AXEL DOUROJEANNI & ANDREI JOURAVLEV, EL CÓDIGO DE AGUAS DE CHILE: ENTRE LA IDEOLOGÍA Y LA REALIDAD 153 (1999).

[132] *Id.* (stating, "[t]ampoco es necesario que los titulares de derechos de agua utilicen efectivamente los caudales a que tienen derecho o construyan las obras necesarias para hacerlo. Estas características del Código de Aguas son únicas en el mundo.").

entirely consume a water right, water may reenter a hydrological system as "return flow." "Return flows occur because some portion of the water extracted by a certain user is not completely consumed and actually returns to the river at some point located downstream."[133] Return flows are a critical source of water since unused and returned water from an upstream rights-holder may contribute or even entirely compose of a downstream user's water right. In Chile, "[r]eturn flows are made available to water users at no charge, but no rights are established to these flows. Changes in patterns of return flows due to trades are therefore not actionable."[134]

Since water is physically attached to land, definitions of ownership need to address whether water can be owned with or without corresponding land ownership. In Chile, water ownership is independent from land ownership,[135] meaning water rights have been severed from land ownership. Severance of land and water rights has several important implications. First, water rights holders can access water even if the water runs on another's private property. Second, this allows water to be collected and transported elsewhere.[136] Third, severance increases the scope of who may own the water, as well as diversifies the possibilities of how the water is used.

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[133] MONICA RÍOS BREHM & JORGE QUIROZ, THE MARKET FOR WATER RIGHTS IN CHILE: MAJOR ISSUES 19 (1995).

[134] Rosegrant, *supra* note 102, at 302.

[135] *Cf.* riparianism, which is "a doctrine of ancient origin that defines water rights in terms of use of water in association with ownership of land. The traditional riparian right to use water is, in an important sense, derivative of ownership of land." JOSEPH L. SAX ET AL., LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS 27 (West 2006) (1986).

[136] "Así, el que tiene derecho a sacar agua de una fuente situada en la heredad vecina, tiene el derecho de tránsito para ir a ella, aunque no se haya establecido en el título." Fija Texto del Codigo de Aguas, art. 8

The scope of ownership is defined in very specific terms. Water rights "are proportional rights (shares) over a variable flow or quantity; deeds stipulate that an owner has the right to a certain number of shares at a certain location. These rights are expressed in volume by unit of time (liters per second or cubic meters per year or month) and are proportional if supply is insufficient."[137] From a general policy perspective, defining the terms of ownership, such as how much and from where water can be withdrawn, enables governing bodies to monitor users, to gauge how much or if any water is left in the system to allocate, and allows an agency to coordinate multiple users on the same hydrological system.

Not only does the Water Code specify how much and from where a water right may be withdrawn, but it classifies this right using three categories. Article 12 of the Water Code defines water as: (1) consumptive or non-consumptive; (2) permaent or contigent; and (3) continuous, discontiunous, or alternating.[138] Under the first category, every water use is defined as either consumptive or non-consumptive. A consumptive use is a "right that does not require that the water be returned after being used, and the owner of this right may totally consume the water in any activity."[139] A non-consumptive use, on the other hand, grants the owner the right to use the water, but the

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(Decreto con Fuerza de Ley Número 1.122); *see generally*, STEPHEN HODGSON, LAND AND WATER – THE RIGHTS INTERFACE (2004).

[137] Rosegrant, *supra* note 102, at 300.

[138] *See*, Fija Texto del Codigo de Aguas, art. 12 (Decreto con Fuerza de Ley Número 1.122).

[139] Guillermo Donoso, *Water Markets: Case Study of Chile's 1981 Water Code,* 33 CIENCIA E INVESTIGACIÓN AGRARIA 157, 160 (2006); *see also*, Fija Texto del Codigo de Aguas, art. 13 (Decreto con Fuerza de Ley Número 1.122).

water must be restored unaltered.[140] The provision establishing non-consumptive use rights was a new addition in the 1981 Water Code to respond to Chile's energy demands. By allowing an owner to "divert water from a stream or river and use that water to generate hydroelectric power," [141] the code intended to stimulate the development of hydroelectricity without harming downstream irrigators.

Water rights are defined under the second category as permanent or contingent, classifications that are conditions based upon the availability of water resources. Permanent uses "[a]re rights to use water in specified amounts, unless the source of supply contains insufficient amounts to meet these needs fully, in which case the flow shall be distributed in equal parts."[142] Contingent uses "[a]re those that only authorize the user to utilize the water at times when the original flow of water is more than sufficient to satisfy permanent rights."[143]

Lastly, water uses are either defined as continuous, discontiunous, or alternating, designations that dictate when an owner may utilize their water right.[144] Continuous uses "[a]re those that permit the use of water in a constant manner, 24 hours a day. In other words, the right can be exercised during the entire day, every day of the year."[145] For

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[140] Fija Texto del Codigo de Aguas, art. 14 (Decreto con Fuerza de Ley Número 1.122).

[141] BAUER, *supra* note 93, at 103.

[142] Donoso, *supra* note 139, at 160.

[143] *Id.*

[144] Fija Texto del Codigo de Aguas, art. 19 (Decreto con Fuerza de Ley Número 1.122).

[145] Donoso, *supra* note 139, at 160.

example, "[d]rinking water rights…are distributed continuously throughout the year."[146] Discontinuous uses "[a]re those that only permit water to be used during given periods. In other words, they can only be exercised in periods and at time defined in the title."[147] Water used for irrigation is an example of a discontinuous use right. "Irrigation rights are associated with a distribution of water volume throughout the year, with variations similar to the variation in irrigation needs for a typical crop."[148] Finally, alternating uses, which are rights "in which the use of water is distributed among two or more persons who use the water successively."[149]

Acquring a Water Right

The right to use water proceeds from ownership. Those seeking to obtain a water right must go through the prescribed procedures for acquiring a right. There are a number of procedures that governing bodies may impose to regulate and systemize the process of obtaining a water right. What procedures are required to obtain a right has profound influence on who can become rights holders. For instance, in Chile there is no application fee to request a water right from the government, which means individuals from any socioeconomic background can request a water right. However, if an individual

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[146] *Id.* at 165.

[147] *Id.* at 160.

[148] *Id.* at 165.

[149] *Id.* at 160.

wants to buy or lease a right from a water rights holder, then this requires money and therefore, certain segments of the population without financial resources will be excluded from participating in the water market. Additionally, requiring applicants to obtain a water right through a regulated procedure allows the governing body to register water rights, which in turn legitimizes those rights and protects the holder's interest if the right is ever encroached upon.

Whereas certain application processes for water rights can be a long and bureaucratic, the process for a new water right in Chile is stripped of procedural complications and heavy government regulation. Essentially, the process to acquire a new water right is a rubber stamp process. The requirements for a new water right are few and can be easily met, which raises conservation and ethical concerns. When an individual or corporation applies for a water right, the appliation only needs to name where the water is going to be withdrawn from, the amount to be withdrawn, how the water will be removed, and how the water should be categorized (i.e. consumptive or non-consumptive).[150] Applications do not require any justifications or specifics as to how the water will be used nor are applications conditional on the type of use.[151]

Applications are processed by the *Dirreción General de Aguas* ("DGA"), Chile's state water rights agency. If water is available, the DGA does not have the authority to deny the request. In addition, the DGA does not have the authority to decide among competing applications if more then one application makes a request for overlapping

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[150] Fija Texto del Codigo de Aguas, art. 140 (Decreto con Fuerza de Ley Número 1.122).

[151] Victor Galaz, *Stealing From the Poor? Game Theory and the Politics of Water Markets in Chile*, 13 ENVTL. POL. 414, 416 (2004).

uses.[152] In fact, if an applicant meets the requirements for a new water right, the DGA "may not refuse to grant new water rights without infringing a constitutional guarantee."[153] In order to address environmental sustainability concerns created by the 1981 Water Code, the 2005 reforms bestowed the DGA with authority to consider environmental aspects in establishing new water rights.[154] However, this provision did not to alter the rubber stamp process for acquiring a water right and without evidence illustrating otherwise, this language was likely inserted in the code to appease political groups and constituents concerned about environmental issues. Essentially, the only limitation in acquiring a water right is whether or not water is available for ownership.

Applications for a right that will or may affect a third party interests have an additional step in obtaining approval. Applicants must publish their filing in the *Diario Oficial*, a daily Santiago newspaper, and in an appropriate regional newspaper.[155] Affected parties only have 30 days to respond to the publication by notifying the DGA.[156] The DGA is then responsible for resolving the conflict, a process that is funded by the affected third party.[157] Decisions reached by the DGA can be appealed to a Court of

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[152] Bauer, *supra* note 113, at 121.

[153] Donoso, *supra* note 139, at 161.

[154] GLOBAL WATER PARTNERSHIP, WATER AND SUSTAINABLE DEVELOPMENT: LESSONS FROM CHILE 3 (2007).

[155] Fija Texto del Codigo de Aguas, art. 131 (Decreto con Fuerza de Ley Número 1.122); Donoso, *supra* note 139, at 160.

[156] Fija Texto del Codigo de Aguas, art. 131 (Decreto con Fuerza de Ley Número 1.122).

[157] *Id.* arts. 135 & 136.

Appeals, a process that requires additional time, funding, and resources from all parties.[158]

If applications have competing requests and there is not sufficient water to meet the needs of all applicants, then the applicants proceed to an auction where water rights are acquired through a bidding process[159] where they are sold to the highest bidder. Only the President has the authority in "exceptional circumstances" to void the acution and determine who should have the water right.[160] In the first eighteen years of the 1981 Water Code, Chile held only two auctions, data that illustrates that auctions have been rare in the past.[161]

Any water use right, regardless of how the right was acquired, whether through an application to the DGA, an auction, or a transfer, must be registered with the *Conservador de Bienes Raices* (CBR) in order to prove ownership of a water right.[162] Registering water rights, if done properly, can be an important tool for coordinating water management or water-related activities, monitoring water uses, and settling disputes. A large reason for registering rights in Chile is to support the market for water rights. Despite the legal requirement to register rights, "an important amount of water rights are not legalized, that is users do not have the corresponding property titles. Different

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[158] *Id.* art. 137.

[159] *See id.* arts. 141-48.

[160] *Id.* art. 148; Donoso, *supra* note 139, at 160.

[161] DOUROJEANNI, *supra* note 131, at 152-53. Note that this data came from the years 1980-1998. I could not find any data pertaining to how many auctions there have been from 1998 to the present day.

[162] Donato Romano & Michel Leporati, *The Distributive Impacts of the Water Markets in Chile: A Case Study in Limarí Province, 1981-1997*, 41 Q. J. INT'L AGRIC. 1, 4 (2001); Galaz, *supra* note 151, at 425.

sources reported that between 50% and 65% have not been legalized yet, even though the Water Code of 1981 compelled [rights holders] to do so."[163]

Transferring Water Rights

The transfer of water rights from an existing user to a new user is feasible under the Chilean Water Code. Transfering water rights can encompass temporary options, such as leasing, or can be a permanent exchange where the ownership of the water right changes hands. In Chile, all transfer options are feasible. According to Bauer, water rights "can be freely bought, sold, mortaged, and transferred like real estate."[164] Transfering water rights requires a market with three basic elements: (1) scarcity, which provides value to the good being exchanged and generates the desire or need for that good; (2) the severance of water and land rights; and (3) institutional infrastructure, which are the laws, regulations, agencies, and processes that allow water rights to be freely exchanged.[165]

The Water Code provides the "legal preconditions for such a market" rather than "mandat[ing] or establish[ing] a water market in rights."[166] Thus, the Water Code is relatively silent in regards to the process of water transfers and leaves transfers to occur

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[163] BREHM, *supra* note 133, at 24.

[164] Bauer, *supra* note 113, at 120.

[165] Oliver M. Brandes & Linda Nowlan, *Wading in Uncertain Waters: Using Markets to Transfer Water Rights in Canada – Possibilities and Pitfalls*,19 J. ENVTL. L. & PRAC. 267, 279 (2009).

[166] Bauer, *supra* note 113, at 122; Fija Texto del Codigo de Aguas, art. 21 (Decreto con Fuerza de Ley Número 1.122).

among private parties.[167] The Water Code further incentives transfers by allowing water uses to change once transferred, which increases both the value of water and the flexibility of its uses.[168]

Coordinating Multiple Uses

Coordinating multiple and competing water uses is a challenge facing every model of freswater management. Other than establishing the three different categories of water uses, the Chilean Water Code does not coordinate diverse uses. Problems relating to multiple users are likely to arise in a legal regime like Chile's where uses are not prioritized, there are no legal protections for downstream water users, and Chile's administrative agency has very little regulatory power to resolve disputes or select between competing uses.

Limitations on Water Rights

Because water rights holders have broad property rights, it is unsuprising that Chile hardly imposes any limitations to qualify or restrict these rights. One limitation that legal regimes may impose on rights-holders is the "no harm" principle, which

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[167] The code does require that transferred rights be registered like real estate. *See* Fija Texto del Codigo de Aguas, art. 114 (Decreto con Fuerza de Ley Número 1.122).

[168] In order to incentive the transfer of water rights, it is not "necessary in transferring water rights to continue the previous type of use to which the water was put, with individuals permitted to freely make changes in such use." Donoso, *supra* note 139, at 159.

prohibits the transer or change of water use if such a change would affect another user in the system. However, such a rule restricts the free market of water rights since it could preclude the sale or transfer of water rights if a third party were affected. Thus Chile's Water Code does not enforce the no harm principle to protect third party interests. Likewise, the Water Code does not employ the "use it or lose it" principle so water rights holders do not have to use their water in order to maintain their right. The absence of the "use it or loose it" principle provides rights holders with the ability to hoard and speculate on water. To counteract these concerns, the 2005 Water Code reforms included a provision that "charge[s] a license fee for unused water rights."[169] In an interview, Chilean water expert Bauer had the following to say about the new license fees:

> The only provision [in the 2005 reforms] that really potentially makes a big difference was the notion that water rights would have to be used or that a fee would be paid for non use. Which is sort of a convoluted formulation anyway. That was aimed at freeing up hydropower rights that people had been speculating with. Clearly the reason for that modification was to encourage hydropower development.[170]

Chile does have a limitation on water ownership that is closely related to the use it or loose it policy. According to this provision, a registered water right that is unused may be transferred to a third party if the third party has freely and openly used that water source without dispute for five years.[171] This provision has proved to be very

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[169] GLOBAL WATER PARTNERSHIP, *supra* note 154, at 3.

[170] Witte, *supra* note 110 (interviewing Carl J. Bauer).

[171] Fija Texto del Codigo de Aguas, arts. 1 & 2 (Decreto con Fuerza de Ley Número 1.122); Rutgerd Boelens et al., *Special Law – Recognition and Denial of Diversity in Andean Water Control*, *in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 161 (Dik Roth et al. eds., Rutgers University Press) (2005).

problematic for indigenous communities. For instance, a community may have a legal right to the water but may not have the resources or infrastructure to use the water. One author has noted that mining companies, particularly in Northern Chile, benefit from this legal provision as they are able to use water that belongs to the indigenous communities.[172]

Some water management schemes enforce a priority system in times of water shortage. Chile's Water Code does not have such provisions. Instead, during periods of water shortage, all rights holders are to equally share shortages.[173] This means, for instance, during a drought that municipals delivering water to cities for consumption, irrigators withdrawing water for agriculture to grow food, and mining industries using water to extract minerals would all have to cut back equally on water use. A priority system, however, could dictate that the mining industry must stop using water during a shortage, and the excess water from stopping a water withdrawal could go towards human consumption and agricultural production, life sustaining activities that are arguably more important water uses then mining.

If Chile were to experience a drought, which is a likely climatic occurrence in Northern Chile with the effects of climate change, the code establishes that the President is the only figure that can declare a shortage "at the request or upon the report of the

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[172] *Id.*

[173] Renato G. Schleyer & Mark W. Rosegrant, *Chilean Water Policy: The Role of Water Rights, Institutions and Markets*, 12 INT'L J. WATER RESOURCES DEV. 33, 37 (1996).

DGA."[174] Declaring a shortage suspends basin supervisory boards (Water User Associations, or "WUA") and allows the DGA to make decisions to minimize damage from the drought.[175] Yet, the code specifies that such a declaration is discretionary,[176] and furthermore, the zones can only be established for six months and are non-deferrable.[177] When a drought zone is declared, water users have the chance to reach an agreement regarding the distribution of water.[178] If no agreement is reached, the DGA then has power to redistribute water for public use.[179] If during this redistribution, a water rights holder receives "a lesser portion of water than is their due…[the holder] will be entitled to state compensation for the lost portion."[180]

The DGA

As already illustrated through the DGA's role and authority in issuing new water rights, the DGA "has very little regulatory authority over private water use,"[181] and

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[174] Fija Texto del Codigo de Aguas, art. 314 (Decreto con Fuerza de Ley Número 1.122); Rosegrant, *supra* note 102, at 306.

[175] Fija Texto del Codigo de Aguas, art. 314 (Decreto con Fuerza de Ley Número 1.122).

[176] *Id.* (stating "*podrá...declarar zonas de escasez…*").

[177] *Id.*

[178] *Id.*

[179] *Id.*

[180] Rosegrant, *supra* note 102, at 306.

[181] Carl J. Bauer, *In the Image of the Market: The Chilean Model of Water Resources Management*, 3 INT'L J. WATER 146, 151 (2005).

instead, the code's laissez-faire principles dictate that private water rights are governed by private civil law. Chile's leading water agency has mostly technical and administrative functions:

> ...gathering and maintaining hydrologic data; inspecting large water works, such as dams and canals; enforcing the rules governing the functioning of private water users' associations; and keeping official registries of certain water rights. The agency can also prepare studies, reports, plans, and policy recommendations, but these have little or no regulatory force.[182]

Scholars, who have analyzed Chile's Water Code, have identified numerous limitations in terms of the DGA's authority. Agency limitations retard the ability to maximize water use efficiency and conservation. For instance, the DGA cannot "cancel and redistribute unused water rights," "create river basin administrative organizations," "create minimum water flows," and cannot "adjudicate conflicts between water users."[183]

Water User Associations

WUA are an important component of the Chilean water management model. There are three types of WUA defined under the Water Code, all of which are afforded legal status and allows them to take out collective loans.[184] A water rights holder is

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[182] BAUER, *supra* note 93, at 34; *see also* Donoso, *supra* note 139, at 161; Fija Texto del Codigo de Aguas, arts. 296 & 299 (Decreto con Fuerza de Ley Número 1.122).

[183] Donoso, *supra* note 139, at 161; BAUER, *supra* note 93, at 33.

[184] ROBERT R. HEARNE & K. WILLIAM EASTER, WATER ALLOCATION AND WATER MARKETS: AN ANALYSIS OF GAINS-FROM TRADE IN CHILE 7 (World Bank Tech. Pap. No. 315, 1995); BREHM, *supra* note 133, at 3.

required to join a WUA,[185] however, WUA membership is restricted to only water rights holders. The Water Code mandates that a WUA form when two or more "persons hold the right to use water from the same source (for example, river, dam, channel or underground water) [as] this creates a de facto association between them."[186] These water rights holders then must agree upon what type of legal association they will establish use to manage their resource.[187] The type of association selected depends upon the type of water body is being managed:

> [Water rights holders] may regulate...[their right] by establishing a water community (*comunidad de aguas*), a channel user's association (*asociación de canalistas*), or any other legal association they may agree on. The formalities of organization are simpler for *comunidades de aguas* than for *asociaciónes de canalistas*. The former are usually in charge of secondary infrastructure used by neighbouring [sic] farmers; the latter are in charge of large infrastructure, from principal channels to dams...In the case of natural sources of water, such as rivers, users must organize as a control committee (*junta de vigilancia*). Both [*comunidad de aguas* and *asociación de canalistas* members] may be members of a *junta de vigilancia*, which may also include individuals, public entities, urban public utility companies, hydroelectric enterprises or any other user that has rights over water coming from a natural source.[188]

Water rights holders can also belong to multiple types of WUA. For example, "a *comunidad de aguas* might govern a secondary channel coming from a principal channel governed by an *asociación de canalistas*.[189]

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[185] Schleyer, *supra* note 173, at 38.

[186] *Id.*

[187] *Id.*

[188] *Id.*

[189] *Id.*

Even though the Water Code stipulates these associations must form, the WUA "are owned and operated by their members, and charge fees based on their capital and operating costs."[190] Even where rights holder owns water contained in a government developed irrigation system, that government system will come under WUA management.[191] WUA have a variety of responsibilities, such as "maintain[ing] the canal systems, keep[ing] records of rights holders, apportion[ing] water to individual rights holders according to their recorded shares, and enforc[ing] water rights."[192]

Conflict Resolution

In terms of resolving conflicts, an aspect of water management that will become increasingly critical with climate change, the Chilean government has minimal involvement "and resolutions rely on private negotiations within the different water user associations [WUA] and the judicial system."[193] Deregulation has shifted the responsibility of conflict resolution to WUA. These WUA function mainly "to distribute water and enforce its correct use by its members, and to collect fees for construction, maintenance and administration of irrigation infrastructure."[194] In the absence of a

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[190] HEARNE, *supra* note 184, at 8.

[191] Schleyer, *supra* note 185, at 7.

[192] HEARNE, *supra* note 184, at 8.

[193] Galaz, *supra* note 151, at 416.

[194] *Id.* at 425; Rosegrant, *supra* note 102, at 307.

powerful central administrative agency, the WUA are the most important institutions for resolving water conflicts and for the allocation of water.[195]

The only alternative other than through a WUA to resolve conflict is to file a complaint through the judicial system. Yet, the Water Code stipulates that the judicial system can only resolve conflicts that could not be resolved by WUA.[196] When a party does seek judicial resolution, they file their disputes before an intermediary civil court as no special water court exists.

[195] Galaz, *supra* note 151, at 425; Rosegrant, *supra* note 102, at 307.

[196] Donoso, *supra* note 139, at 168.

CHAPTER V

CASE STUDIES

Understanding the specifications of Chile's Water Code and identifying provisions that may create ethical problems under climate change only creates a theoretical picture. Since climate change has not yet drastically shifted hydrological patterns for many communities, there are no case studies to point to at this time. Nevertheless, the best means to illustrate the anticipated ethical dilemmas resulting from climate change is to shift this analysis from theoretical to empirical. To illustrate perceived ethical dilemmas and events that have yet to occur is to identify case studies that highlight the current ethical problems with the Water Code that will only worsen with climate change. The case studies draw from a variety of disciplines, but all examine the ethical deficiencies created by Chile's water laws. Using case studies from different academic disciplines provides multiple methods and perspectives of approaching the same issues. Bringing these studies together and the conclusions these studies reach, highlight common ethical concerns that are already embedded in Chile's water management regime, concerns that can be tied back to specific legal provisions.

The Disparate Effects of Water Resource Management: Case Studies

Low-Income Farmers

In the first study, Donato Romano and Michel Leporati examined the 1981 Water Code's distributive impact on "peasants," a population the authors defined as "the poorest sectors and on those whose subsistence is mainly dependent on access to water."[197] The authors undertook this study because they noted that most of the studies on Chile's Water Code debated the efficiency of water markets and whether water markets were advantageous or disadvantageous. Thus, the authors countered the usual water market debate with scholarship discussing distributional disadvantages.[198] To measure distributive impacts, the study analyzed water registrations between 1981 and 1997 from the Limarí river valley.[199] The registered water users in this region were "peasant agriculture, capitalist agriculture and non-agricultural sectors."[200]

The province of Limarí in northern Chile is a semi-arid region that produces commercial crops such as "*pisco* grapes, avocados, green peppers and artichokes."[201] Even though the average rainfall "does not exceed 120mm and the potential

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[197] Donato Romano & Michel Leporati, *The Distributive Impacts of the Water Markets in Chile: A Case Study in Limarí Province, 1981-1997*, 41 Q. J. INT'L AGRIC. 1, 2 (2001).

[198] *Id.* at 3.

[199] *Id.* at 4.

[200] *Id.* at 6.

[201] Eduardo Zegarra, Water Market and Coordination Failures: The Case of the Limarí Valley in Chile 31 (July 2002) (unpublished Ph.D. dissertation, University of Wisconsin-Madison) (on file with author).

evapotranspiration exceeds 1,000mm,"[202] the Limarí valley is still one of the two "most significant Chilean agricultural valleys in which active water markets appeared after the 1981 Water Code."[203] Agriculture is productive in this region because of "La Paloma System," a series of reservoirs and channels. This infrastructure facilitates an active water market that enabled Romano and Leporati's study.

The results of the study found that the 1981 Water Code had a disparate and negative effect on lower income water users. Following implementation of the 1981 Water Code, all sectors of water users were active in the water market.[204] An active market, however, does not mean equitable participation among all the water rights holders. Peasants were active in the market, but through claims of original rights, whereas non-agricultural sectors were involved in transactions since these stakeholders were more likely to re-sell water than were peasants.[205] As time progressed, the authors found that the distribution of water rights among various stakeholders became unbalanced as "[p]easant agriculture show[ed] a general and consistent loss of water resources (-83.37% in terms of per capita water shares, with the number of users decreasing from 10,360 in 1981 to 4,800 in 1997)."[206] According to the authors, peasants were losing water rights because of "the worsening of peasants' income distribution" and

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[202] Nicole Kretschmer, Sandrine Corso & Pablo Alvarez, *Water Allocation Strategies and Their Implications – A Drought in the Limarí Watershed, Chile*, WORLD WATER CONGRESS 2, Sept. 2004, http://www.worldwatercongress2008.org/resource/authors/abs564_article.pdf.

[203] Zegarra, *supra* note 201, at 30.

[204] Romano, *supra* note 197, at 10.

[205] *Id.* at 11.

[206] *Id.* at 8.

"the accumulation of resources by the most powerful social-economic groups."[207] From this empirical evidence, the authors concluded, "that the market, when left to itself, though able to increase the general efficiency of the system, is not able to ensure an equitable distribution of resources and income."[208]

A second study, conducted by Victor Galaz, also looked at the distributive impact of Chile's Water Code on small farmers rather than market efficiencies, but used game theory rather than water registrations to explain how water markets disempowered underprivileged rural communities.[209] In the study, Galaz provides two cases where underprivileged water users failed to successfully challenge water rights:

> Peasant farmers in Las Pataguas, Valdivia de Paine, located 50 km from Santiago, have experienced a severe and long-lived water conflict with a real estate investor. The conflict started in the early 1970s as a result of construction by the investor on his own plots. This led to serious disturbances of the water flow to the farmers. The diversion was, according to governmental officials, a deliberate attempt to destroy the productivity of the land, and to force the peasant farmers to sell their plots. It was not until 1986 – after more than ten years (!) – that a few of the farmers individually decided to take the problem to court. The ruling was in favour of the farmers, but this did not stop the continued diversion of water by the real estate investor. The same procedure was repeated in 1991: an appeal to the court led to a ruling in favour of the farmers, but this did not stop continued violations of their water rights by the investor. This problem has affected the income of 300 persons dependent on small scale agriculture to such an extreme that a number of them felt obliged to sell their plots and find other sources of income.[210]

The second case study tells a similar story:

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[207] *Id.* at 8, 11.

[208] *Id.* at 8.

[209] *See* Victor Galaz, *Stealing From the Poor? Game Theory and the Politics of Water Markets in Chile*, 13 ENVTL. POL. 414 (2004).

[210] *Id.* at 419 (citing Carmen Cancino, *Conflicto de Aguas de Regadío en el Sector Las Pataguas-Valdivia de Paine*, conference paper, Santiago (2001)).

> Small farmers organized in a water user community in the Azapa valley, Arica, have experienced similar problems. In 1981 the water company SENDOS (Servicio Nacional de Obras Sanitarias) made a request to the DGA (General Directorate of Water) – the governmental agency in charge of granting new water rights – for the exploitation of 550 litres [sic] per second of water. The request was denied by the DGA, largely because of a petition put forward by the farmers showing that this extraction would severely affect existing water flows normally used by them for irrigation. Despite the DGA's decision, and without the necessary water rights, SENDOS decided in 1984 to start the construction necessary for water exploitation. Once again, the farmers took the case to court, which ruled in their favour [sic] and ordered a halt to constructions. This temporarily halted construction, but in 1991 the water company ESSAT (Empresa de Servicios Sanitarios de Tarapacá S.A.) – a privatised [sic] version of SENDOS – resumed the exploitation of the aquifer in the Azapa valley. This violation was once again taken to court, but this time the court rejected the claim and the farmers lost the case. ESSAT is now exploiting water resources in the valley.[211]

According to Galaz, these and countless other similar stories[212] of disparate impacts on marginalized populations are the real-life consequences that were incentivized by the 1981 Water Code.[213]

Galaz concludes that *campesinos*[214] or any indigent water right holder will accept violations of their water rights that benefit more powerful and resourceful water rights holders.[215] When a violation occurs, water rights holders have two options to redress the wrong: report to a WUA or litigate through the judicial system. Yet neither option is actually viable for disadvantaged groups. WUA are unlikely to resolve a dispute in favor

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[211] *Id.* (citing D. Aviles Herbas, *Sobreexplotación del Acuifero del Valle de Azapa – Arica I Región*, *in* CONFEREDERACIÓN DE CANALISTAS DE CHILE (1993)).

[212] *See id.* at 420 (referring to Table 1, which documents a number of water rights violations against underprivileged water users).

[213] Galaz, *supra* note 209, at 429.

[214] *Campesinos*, as defined by Galaz, are "peasant farmers." *Id.* at 424.

[215] *Id.*

of a poor farmer since "big agriculture tends to dominate" the WUA.[216] Poorer parties are risk adverse to litigation because they do not have the resources to fund it.[217] Given "the fact that water users are highly heterogeneous in terms of social and economic power…it [is] very costly and irrational for poor water users to report violations of their water rights."[218]

Consequently, "wealthy users[] are provided with a highly advantaged position."[219] Tolerance of water rights violations enables wealthier water right holders to have "theoretical access to 'free water.'"[220] For instance, if a water rights holder needs more water, the options are: (1) to buy or lease water rights, which can be costly; (2) increase water efficiency, an option that also has associated costs; or (3), steal water from low-income individuals who do not have the power to enforce their legal rights.[221] Since stealing water is the most rational and cost-efficient way of increasing one's water needs, Galaz reasons that this will be the approach wealthier water rights holders use to meet increasing demands. Domination over water resources by the powerful and financially secure users also helps explain the anomaly "that the rural population in Chile has less

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[216] *Id.* at 430.

[217] *Id.*

[218] *Id.* at 429.

[219] *Id.* at 432.

[220] *Id.* at 431.

[221] *Id.*

access to improved drinking water (58% in the year 2000) than in countries such as Argentina (73% in 1990), Bolivia (64% in 2000) and Uruguay (93% in 2000)."[222]

Indigenous Populations: Mapuche

A third study, authored by Lila Barrera-Hernández, examines the struggles of Chile's Mapuche people against the development of the Pangue-Ralco Dams in order to maintain control over the water resources within their territories.[223] The Mapuche are indigenous peoples of South America who, following a long history struggling against subjugation, now largely live in Chile and Argentina.[224] The Mapuche are "spiritually, culturally and materially connected" to their "lands and resources, particularly water."[225] Even the name "Mapuche," which translates to "people of the land," signifies the community's connection to their surrounding natural resources and environment.[226]

One of the Mapuche territories, the upper Bio Bio, became a controversial site and a battle for control over natural resources in 1989 when the Chilean government

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[222] *Id.* at 416 (citing United Nations Statistics Division, Demographic and Social Statistics, http://unstats.un.org/unsd/ demographic/social/watsan.htm (last visited Aug. 6, 2003)). The most recent UNSD report – June 2009 – provided the following statistics for improved access to water in rural areas: Argentina (80% in 2009), Bolivia (69%), Uruguay (100%), Chile (72%). United Nations Statistics Division, Demographic and Social Statistics, http://unstats.un.org/unsd/demographic/products/socind/watsan.htm (last visited April 28, 2010).

[223] Lila Barrera-Hernádez, *Indigenous Peoples, Human Rights and Natural Resource Development: Chile's Mapuche Peoples and the Right to Water*, 11 ANN. SURV. INT'L & COMP. L. 1, 2 (2005).

[224] *Id.* at 12.

[225] *Id.*

[226] *Id.*

approved a hydroelectric development project called the Pangue-Ralco Dams. What ensued was a lengthy legal battle between the various stakeholders and the Mapuche, who were fighting to protect their land and culture.[227] The conflict ended when the stakeholders signed the Amicable Agreement on September 16, 2003, which permitted the dam construction to proceed. Barrera-Hernández concludes that the Mapuche suffered this loss because "[t]he implementation of [Chile's] neo-liberal economic policies ...resulted in increased pressure and demands over indigenous lands, water, and other resources resulting in numerous confrontations between indigenous peoples and the government."[228]

The fight over water rights was a central component in the construction of these dams, particular in the Ralco project. When the Chilean government approved the projects, *Empresa Nacional de Electicidad S.A.* (ENDESA), the private electric company constructing the dams, already owned a substantial portion of the water rights but needed to secure even more rights to operate the dam.[229] To supplement their needs, ENDESA filed for rights to the water that flowed through indigenous territory. Opponents of the project challenged the application through the judicial system, but the court ruled in favor of ENDESA and granted the private company water rights and failed to protect the indigenous claim to the resource.[230]

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[227] For a good summary about the legal dispute over the construction of the Pangue-Ralco Dams, *see id.* at 14-22.

[228] *Id.* at 13.

[229] *Id.* at 22.

[230] *Id.* at 23.

According to Barrera-Hernández, ENDESA was able to claim these water rights because the Chilean Water Code's treatment of water.[231] First, the code allowed ENDESA to acquire private rights to the water because the code only mandates that the company had to demonstrate that the water was physically and legally available.[232] This was not a challenge for ENDESA as the code does not legitimize water rights acquired through traditional rights without special proof, and thus the Mapuche were unable to have their traditional water rights legally recognized.[233] Second, the code severed the relationship between land and water rights. As a result, even though the Mapuche had a right to traditional lands, these lands were not concomitant with water rights.[234] While the Amicable Agreement had terms to compensate the Mapuche for property lost by the projects, this property did not include water rights.[235]

In the conclusion of her article, Barrera-Hernández searched for legal responses to address the gap in indigenous water rights created by the Chilean Water Code. The author found none.[236] She concludes by stating: "[t]he results of the combined application of neo-liberal water and natural resources development law and policy in Chile is a relegation of indigenous customary water rights and water management

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[231] *Id.* at 25.

[232] *Id.* at 24.

[233] *Id.*

[234] *Id.*

[235] *Id.*

[236] *Id.* at 26.

practices in favour [sic] of economic development uses where water is deemed to achieve its maximum potential value."[237]

Indigenous Populations: Aymara

The fourth and final case study under review here, which combines previous field research with a recent Chilean Supreme Court case, is the most recent and perhaps the most hopeful story for protecting disadvantaged users. The judicial opinion suggests that secure water rights for underprivileged populations is possible through legal pluralism, which could lead to stronger ethical results for water users. Between January 2003 and February 2004, author Isabel Maria Madaleno conducted participant interviews of Aymara peoples in Chile's Tarapacá region to record the consequences of the 1981 Water Code on the Aymara people.[238] The Tarapacá region in northern Chile is ancestral territory for the Aymaran Indians.[239] The region is arid with "[s]evere climate and scare natural resources."[240] Because the water source for the region is fed by rainfall or glacier snowmelt and therefore is in short supply,[241] the Aymara people spatially organized settlements and ancestral farming practices to best utilize the region's natural

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[237] *Id.* at 27.

[238] Isabel Maria Madaleno, *The Privatisation of Water and its Impacts on Settlement and Traditional Cultural Practices in Northern Chile*, 123 SCOT. GEOGRAPHICAL J. 193, 195 (2007).

[239] *Id.*

[240] *Id.* at 197.

[241] *Id.*

resources.[242] Traditional practices were disrupted and displaced by Spanish colonization because the Spanish valued the land for its mineral resources.[243] Today, the Aymara people still live in this region, but the scarce water supply is in greater demand from the agriculture, mining, and hydroelectric power generation industries that have moved into the region.[244]

According to Madaleno, implementation of the 1981 Water Code led to disastrous results.[245] Conflict over water resources, which tends to favor wealthier economic groups over indigenous populations, is forcibly removing the Aymara population from their land and forcing them to abandon their traditional lifestyle.[246] Take, for example, the 14 year long conflict between the Aymara communities and Agua Mineral Chusmiza, a private water bottling company. Agua Mineral Chusmiza moved into Chusmiza, a remote Andean pueblo containing sulphur rich spring water in order to bottle and sell this water, water that is used by the Aymara for traditional irrigation practices and water the community believes have performed miracles, such as curing paralysis.[247] The Aymara filed a lawsuit in the 1990s against the private industry.

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[242] *Id.* at 195.

[243] *Id.*

[244] *Id.* at 200.

[245] Isabel Maria Madaleno & Alberto Gurovich, *Conflicting Water Usages in Northern Chile*, 44 BOLETÍN DE LA A.G.E. 439, 440 (2007).

[246] Madaleno, *supra* note 238, at 206.

[247] Madaleno, *supra* note 246, at 441.

For 14 years, the case made no headway. Madaleno reasoned that private industries like Agua Mineral Chusmiza were able to trump traditional water rights because the Water Code "separated water from land ownership, ascribed separately superficial and groundwater resources, and permitted faster return activities, such as mining, to appropriate all available water rights. Ancestral group loyalties were broken and the water cycle and the ecosystem approach, for so long respected, abandoned by the new water management models."[248]

The Aymara lawsuit against Agua Mineral Chusmiza did not conclude like the Mapuche-ENDESA conflict. Rather, this past November 2009 the Chilean Supreme Court reached an unprecedented ruling when it unanimously upheld the indigenous communities' water rights, producing the first judicial ruling in favor of such rights.[249] The Supreme Court reasoned that Agua Mineral Chusmiza activities amounted to a constitutional violation.[250] According to Article 19 of the Constitution, "[t]he rights of private citizens over waters, recognized or constituted in conformity with the law, shall grant proprietorship to the owners thereof."[251] From this provision, the Court reasoned that the constitutional language "recognized or constituted" included waters not only recognized by the Water Code, which would favor only private companies to the detriment of the Aymara, but the language also recognized water granted under laws that

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[248] Madaleno, *supra* note 238, at 204 (internal citations omitted).

[249] Jeremy Valeriote, *Chile's Supreme Court Upholds Indigenous Water Use Rights*, THE SANTIAGO TIMES Nov. 30, 2009.

[250] Alejandro Papic Dominguez con Comunidad Indigena Aymara Chuzmiza v. Usmagama, No. 2840-2008 (Nov. 25, 2009), http://www.elaw.org/node/5317.

[251] CONST. CHILE art. 19 § 24.

established customary uses of water to indigenous communities. The Court specifically referred to Article 64 of *Ley 19.253*, also known as the Indigenous Law. The Indigenous Law reads:

> One must especially protect the waters of Aymara and Atacama communities. Waters will be considered property to be owned and used by the indigenous community, established by this Act, the waters found in the areas of the community, such as rivers, canals, ditches and slopes, without prejudice to the rights that third parties have registered pursuant to General Water Code....New water rights are not be granted on lakes, ponds, springs, rivers and aquifers that supply water to the property of several Indigenous Communities established by this law without guaranteed, in previous form, the normal water supply to the affected communities.[252]

The Indigenous Law was enacted in 1993 specially to counteract the drastic consequences the neoliberal water policies were having on indigenous communities. The law was legislated following Pinochet's ousting in March 1990 and Chile's re-democratization.[253] After the implementation of the 1981 Water Code, which did not carve out provisions to address traditional uses of water, indigenous water problems received very little attention.[254] With the growing economy and competing water uses, most indigenous peasants had no water rights by the 1990s.[255]

The Indigenous Law was introduced to fill this gap in the Water Code. Under Article 20 of the Indigenous Law, the constitution, regularization, or purchase of water

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[252] Alejandro Papic Dominguez con Comunidad Indigena Aymara Chuzmiza v. Usmagama, No. 2840-2008 (Nov. 25, 2009), http://www.elaw.org/node/5317 (translated by author).

[253] David Carruthers, *Environmental Politics in Chile: Legacies of Dictatorship and Democracy*, 22 THIRD WORLD Q. 343, 345 (2001).

[254] Rutgerd Boelens et al., *Special Law – Recognition and Denial of Diversity in Andean Water Control, in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 158 (Dik Roth et al. eds., 2005).

[255] *Id.*

rights is guaranteed.[256] In the provision cited by the Chilean Supreme Court, the law also prohibits new water rights over an indigenous water supply without guaranteeing a normal water supply to indigenous communities.[257] Using this provision, the Court concluded, "[o]n this topic [of Article 64] it is useful to clarify that any lack of registration of customary water rights does not mean [the right is] absent, but [its absence means] only the lack of formalization and registration...[P]recisely because the right exists, it is recognized by law...."[258]

The Indigenous Law is a perfect example of legal pluralism in effect. Under the 1981 Water Code, traditional uses of water were not automatically legally recognized and therefore traditional water uses were granted to other water users. To legitimize rights excluded from the Chilean Water Code, legislators passed the Indigenous Law, which incorporated and validated non-western values of water resource management into the market system. Undeniably, there are a lot of contradictions between the Water Code and the Indigenous Law, and ultimately the Water Code is primarily seen as the stronger of the two authorities.[259] Nevertheless, the outcome of the Supreme Court case is quite significant because it substantiates the authority of the Indigenous Law and serves as a tool for a more ethical management over water resources.

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[256] Indigenous Law, Chile (Number 19,253 D. of 5/10/2003), art. 20 ("[f]inanciar la constitución, regularización o compra de derechos de aguas o financiar obras destinadas a obtener este recurso.").

[257] CONST. CHILE art. 64; Boelens, *supra* note 255, at 159.

[258] Alejandro Papic Dominguez con Comunidad Indigena Aymara Chuzmiza v. Usmagama, No. 2840-2008 (Nov. 25, 2009), http://www.elaw.org/node/5317.

[259] Boelens, *supra* note 255, at 157-61.

Common Themes

The synthesis of these four studies highlights a number of important issues for this thesis.[260] First, the policies of the 1981 Water Code have inequitable and disproportionate impacts upon specific segments of the Chile's populations. Climate change will only exacerbate these disparities and encourage wealthier or more powerful water rights holder to violate traditional rights or rights held by weaker users. Those right holders with political and financial security will be able to protect existing rights by utilizing the WUA to their advantage or accessing the courts. Furthermore, as Galaz's game theory analysis suggests, wealthier water users will be able to supplement diminishing water sources with the rights belonging to disadvantaged populations in a changing climate and not have to fear compensation. Second, these studies begin to create an identity for the populations experiencing the greatest negative consequences from the 1981 Water Code. The communities include those that have limited social influence and economic resources, whose subsistence is dependent upon reliable water resources, and those who were at one time autonomous but now struggle to self-define. Literally, the Chilean water model and policy is "destroy[ing] or erod[ing] existing systems of local water rights in peasant and indigenous communities who had vested rights through years of labor investments and use."[261]

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[260] In addition to the four case studies offered in this thesis, a recent article in the New York Times reported similar water woes occurring in Quillagua, Chile. *See* Alexei Barrionuevo, *Chilean Town Withers in Free Market for Water*, NEW YORK TIMES, Mar. 14, 2009, *available at* http://www.nytimes.com/2009/03/15/world/americas/15chile.html.

[261] Rutgerd Boelens & Margreet Zwarteveen, *Anomalous Water Rights and the Politics of Normalization: Collective Water Control and Privatization Policies in the Andean Region, in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 114 (Dik Roth et al. eds., 2005).

The third lesson extracted from these case studies is that there is no institutional protection for these populations. Not only do these populations have substantially inequitable rights, but these populations experience procedural inequity as well since they have no voice in the legal process. Fourth, public choice theory suggests disadvantaged populations have too distinct of interests and are too fragmented to mobilize and influence legal change. Consequently, it is highly unlikely that Chilean legislators would make public policy decisions to reform water laws that would favor these groups. Fifth, as an economic model, the 1981 Water Code is incapable of accounting for environmental and social needs, which is an unsurprising conclusion given the Pinochet reforms did not address these issues. "[T]he economic way of thinking about water and thinking about water as a commodity or a good has not helped to alleviate the tension with the human rights and ethical way of thinking. This is because very often the underprivileged are not satisfied with simple money."[262]

Lastly, the recent Supreme Court decision upholding water rights for the Aymara demonstrates that equitable and ethical solutions for water needs are not found in the current Water Code. Rather, the Supreme Court had to find an alternative legal authority to the Water Code in order to legitimize the indigenous people's water rights. This decision is one example that a legally pluralistic framework is an ethical solution to current and future water supply shortages.

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[262] *Panel: Ethics-Based Decision-Making in Societal Water Management,* 6 SANTA CLARA J. INT'L L. 57, 60 (2008).

Factoring in Climate Change

None of the four case studies address the effects of climate change. Thus, the synthesis of these materials heightens the concern that governments are ignoring diverse water values while downplays the connection to climate change. In the absence of climate change, many of the arguments made in this thesis are still relevant and reforms to water management schemes could address the homogenization of water practices. In the absence of climate change, I would still argue that a universalistic approach to water management ignores diverse cultural water needs.

Climate change factors in though because it creates an ethical obligation for sovereignties to respond to the water crisis in a manner that can address the underlying disparate impacts of freshwater resource management. Questions of ethical water resource allocation inextricably overlap with climate policy initiatives. And as the next chapter illustrates, often times the problematic ethical provisions are the very same provisions that will be problematic under climate change. As policymakers and scholars search for ways to reform water management under climate change,[263] this thesis exposes the often-overlooked ethical consequences of water management decisions that policymakers should take into account while reforming legal models. Without a voice in climate change water reform, these marginalized populations will likely witness the re-allocation and re-prioritization of water uses that excludes their needs.

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[263] *See, e.g.*, Robert W. Adler, *Climate Change and the Hegemony of State Water Law*, 29 STAN. ENVT. L.J. 1 (2010).

CHAPTER VI

ETHICAL ISSUES

As the previous chapter illustrated, Chile's water resource management promotes inequity among water users because the system allows for the abuse of disadvantaged users. This inequity is occurring in the absence of climate change altering hydrologic conditions, which raises serious concerns that water scarcity caused by climate change will intensify inequity. This raises the question of this chapter: what specific legal provisions are causing or contributing to this inequity? The analysis below illustrates that flexibility will be an important component to an ethical framework for managing water in a changing climate. Chile employs many legal principles that promote flexibility which, generally speaking, should be preserved in water policy reforms. However, the code's adaptability fails to justly allocate water resources because the code is geared towards an economic rather then an ethical model. The following discussion indentifies some of the most important legal principles in designing an ethical framework given the anticipated hydrologic effects of climate change.

Water Markets

Although a water market is an attractive option to manage water resources in response to climate change given the flexibility of a free market system,[264] privatizing water rights and treating water resources as a commodity has significant ethical shortcomings. According to law professor Joseph Dellapenna, a scholar on water management and international comparative law, water markets are problematic because they create externalities that are inherently unethical.[265] Dellapenna defines an externality as "a use by a person [that] affects uses by other users drawing from the same source, with the result that any significant a change in use infringes upon the interests of the other users."[266] These externalities arise, "when one user attempts to convey her water right to another, particularly to one seeking to make a completely different use of the water."[267]

In Chile, those externalities impact population segments that do not have the finances to participate in the water market, and therefore, do not have a legally protectable interest. Rather "[w]ater markets are generally driven by those who have the most capacity to participate in the market: big irrigation, industry, and those with

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[264] "One of the main efficiency gains from a water market is that it allows higher flexibility in the allocation of the resource, avoiding the traditional bundling of water and land rights." Eduardo Zegarra, Water Market and Coordination Failures: The Case of the Limarí Valley in Chile 20 (July 2002) (unpublished Ph.D. dissertation, University of Wisconsin-Madison) (on file with author).

[265] Joseph W. Dellapenna, *Adapting the Law of Water Management to Global Climate Change and Other Hydropolitical Stresses*, 35 J. AM. WATER RESOURCES ASS'N 1301, 1307 (1999).

[266] *Id.*

[267] *Id.*

urbanization concerns."[268] Consequently, when water is treated as a commodity, the economic value will trump other non-economic values embedded in water. For instance, there have been "cases...where third parties request water rights [that] have belonged by tradition to another person."[269] Thus, those segments of society unable to take part in the water market will always be the losers in such a system.

Another inevitable loser in the free-market system is the environment itself because the free-market system does not incentivize conservation. Although this thesis is primarily focused on the human aspect of ethical issues, policymakers should be aware that water ethics includes an ecological dimension as well. According to Peter Gleick, an international expert on freshwater resources, selling water deters conservation because increased efficiency leads to decreased revenue and "conservation is often less capital intensive and therefore creates fewer opportunities for investors."[270] Yet proponents of water markets defend the system by arguing that "[i]ncreased marketability could both redirect available water to needed areas of growth, and inject...incentives for conservation. Water marketing could also enable water rights to be purchased for environmental purposes via instream conservation easements, trusts, or similar devices."[271] More important then the substance of this debate for the purpose of this

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[268] *Panel: Water Ethics and Commodification of Freshwater Resources*, 6 SANTA CLARA J. INT'L L. 15, 18 (2008) (commentary made by Dr. Larry Swatuk).

[269] MONICA RÍOS BREHM & JORGE QUIROZ, THE MARKET FOR WATER RIGHTS IN CHILE: MAJOR ISSUES 24 (1995).

[270] PETER H. GLEICK, GARY WOLFF, ELIZABETH L. CHALECKI & RACHEL REYES, THE NEW ECONOMY OF WATER: THE RISKS AND BENEFITS OF GLOBALIZATION AND PRIVATIZATION OF FRESH WATER 51 (2002).

[271] Robert W. Adler, *Climate Change and the Hegemony of State Water Law*, 29 STAN. ENVTL. L.J. 1, 10, 25 (2010).

thesis is to note that the Chilean Water Code has no provisions to incentive conservation efforts. Thus, future research should examine what legal provisions will best protect environmental ethics.

Narrow Definition of Legally Cognizable Interests

There are specific provisions within the Water Code, such as Articles 131, that precipitate disparate impacts. According to Article 131 of the Water Code, when an applicant is filing for a new water right that may or will effect a third party, the applicant is required to notify the third party by publishing their request for a water right in a regional publication or official periodical.[272] However, this legal procedure presumes effected parties have access to the publication, know to actively look for such information in the gazette, or even have the ability to read or comprehend the published information. Additionally, third parties are only those who have legally recognized water rights. Thus, individuals or communities using water without a legitimate claim to that water cannot be harmed in a legal sense if a new rights holder diminishes the water's flow.

The Water Code is able to define who does or does not have a protectable interest. If a code creates too broad of a definition for recognizable interests, then the code risks being impractical because the code cannot realistically protect everyone's water interests and needs, especially under climate change scenarios. For instance, if a management

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[272] Lila Barrera-Hernádez, *Indigenous Peoples, Human Rights and Natural Resource Development: Chile's Mapuche Peoples and the Right to Water*, 11 ANN. SURV. INT'L & COMP. L. 1, 25 (2005); Fija Texto del Codigo de Aguas, art. 131 (Decreto con Fuerza de Ley Número 1.122).

model allowed any community or individual to challenge a water use or transfer that caused harm regardless if those challenging had a legal right, the model would be rendered useless. On the other hand, if the code defines what parties have a legally cognizable interest too narrowly, the code risks being unethical by excluding segments of society that have no compensation for harms caused by other users. The challenge in creating an ethical framework for water resource management is striking a balance in defining who has a legally protected interest.

Conflict Resolution

Water User Associations (WUA)

Problems with procedural equity also arise in resolving conflicts over water rights. Recall that the Water Code decentralized water governance to the extent that conflicts are resolved either by market forces, the WUA or by the judicial system. Of these options, the WUA is the primary means of resolving conflicts. Shifting the responsibility of conflict resolution to a WUA creates a number of problems. "One major problem...is that the Chilean water user associations are by no means...the well-developed institutions some claim."[273] On a related note, WUA are criticized for lacking the professionalism to resolve conflicts since "many lack the legal as well as technical

[273] Victor Galaz, *Stealing From the Poor? Game Theory and the Politics of Water Markets in Chile*, 13 ENVTL. POL. 414, 425 (2004).

capacity needed to solve water resource conflicts."[274] Since WUA have restricted membership, meaning only a water rights holder can belong, a selective portion of rights holders actually benefit from WUA services. Scholars criticize the WUA because recognized water rights holders can be excluded from WUA and remain unorganized.[275] Furthermore, community members who do not hold rights but are impacted by WUA decisions are excluded from the process.

Internal politics and the socio-political power differentials between members of the WUA also influence members' decisions whether to use the WUA services. Since WUA are dominated by water rights holders of big agriculture,[276] "*campesinos* seldom have access to them because either they do not tend to be de facto members of them, or – if they are – they do not trust them to represent their interests."[277] Consider the following example:

> In Belén, Precordillera Comuna de Putre, the great majority of irrigators, smallholders who depend on agriculture for their livelihoods, called for changing the irrigation schedule in order to intensify their agriculture and save water. They wanted to have more frequent irrigation turns with smaller flows, a decision ratified in several community assemblies. But in Belén, a majority of water shares is owned by a small group of wealthy absentee landholders who reside in the city of Arica and make a living out of other economic activities. They only go to the irrigation system when necessary, for example when they have their water turns. Obviously, they have no interest in increasing irrigation frequency, for it would mean more time and travel costs. This group's voting weight and related

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[274] *Id.* at 426.

[275] *Id.*

[276] *Id.* at 430; CARL J. BAUER, AGAINST THE CURRENT: PRIVATIZATION, WATER MARKETS, AND THE STATE IN CHILE 67 (1998).

[277] Galaz, *supra* note 274, at 426.

> decision-making power prevents the majority of smallholders who depend on agriculture from improving their irrigation system and economic productivity.[278]

Considering these dynamics, "the probability is low that peasant farmers will try to get assistance from the widely recognised [sic] and important Chilean WUA."[279]

Judicial System

Parties may also choose to have their disputes resolved through the judicial system. However, like the WUA, the judicial system has a number of flaws that create a barrier to justice, particularly for unprivileged individuals as well. First, the judicial system "is too slow, too costly and too unpredictable."[280] The judiciary is considered "unpredictable" because "judges often must take a decision based on limited information or technical expertise, few legislative or constitutional guidelines and little time for deliberation."[281] Chile does not employ special arbiters of water disputes, which results in "similar cases...sometimes resolved in radically different ways."[282] The average length the court takes to resolve a case also poses as a barrier to justice. During the years 1992-1993, ordinary civil law cases took 1,009 days to settle, primarily because the

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[278] Rutgerd Boelens & Margreet Zwarteveen, *Anomalous Water Rights and the Politics of Normalization: Collective Water Control and Privatization Policies in the Andean Region, in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 111 (Dik Roth et al. eds., 2005).

[279] Galaz, *supra* note 274, at 426.

[280] JOHN BRISCOE, PABLO ANGUITA SALAS & HUMBERTO PEÑA T., MANAGING WATER AS AN ECONOMIC RESOURCE: REFLECTIONS ON THE CHILEAN EXPERIENCE 9 (World Bank) (1998).

[281] Galaz, *supra* note 274, at 427 (citing to BAUER, *supra* note 277, at 22.

[282] BRISCOE, *supra* note 281, at 6.

judicial system was under-resourced.[283] Given the technical and complicated nature of hydrology, water disputes are often more complicated to resolve then say a breach of contract claim or tort claim. Therefore the average time to resolve a dispute about water could be longer then 1,009 days. In the face of climate change, cases may become moot before a court may resolve a dispute.

The longer a conflict remains unsettled, the more costly the dispute becomes for litigants. This means indigent individuals or groups are precluded from the judicial system because of financial barriers.[284] While there is fee legal assistance in Chile for clients of limited means, the availability of such assistance "tends to be irregular and chronically lacking personnel and financial resources."[285] Low-income individuals also view the courts unfavorably, perceiving them "as designed 'by the rich for the rich.'"[286] If a litigant is unsuccessful in a court of first impression, appealing the decision is a procedural option but financially unrealistic. In 2002, attorney fees for an appeal were estimated to be $670 USD, a prohibitive cost when the total annual income for a *campesino* was "well below $500 USD."[287]

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[283] JUAN ENRIQUE VARGAS VIANCOS & JORGE CORREA SUTIL, DIAGNÓSTICO DEL SISTEMA JUDICIAL CHILENO 44 (1995); Galaz, *supra* note 274, at 427.

[284] *See* Rutgerd Boelens et al., *Special Law – Recognition and Denial of Diversity in Andean Water Control*, *in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 158 (Dik Roth et al. eds., 2005) (stating "[b]ecause of the high costs and legalistic tradition connoted by law suites, indigenous and rural communities generally cannot make use of civil law.").

[285] Galaz, *supra* note 274, at 427.

[286] *Id.* at 428.

[287] *Id.* at 427.

Neither the WUA nor judicial system offers indigent water users a realistic forum for dispute resolution. Given the restricted membership, internal politics disfavoring certain water right holders in WUA, and the internal problems – slow resolution, unpredictability – and external problems – cost and individual perception of the judicial system – most "violations are *not* reported by a majority of low-income citizens."[288] Consequently, the Chilean water law has created a management scheme that presents fundamental socioeconomic concern in regards to conflict resolution.

Weak Governing Agency

The Water Code created WUA to fill in the gaps that resulted from decentralizing water management and establishing the DGA as merely an administrative and technical agency. Water agencies with strong centralized powers are capable of overseeing water rights, ensuring regulation, and even adjudicating water disputes. However, the DGA is unable to perform any of these legal duties. One important function that the DGA does perform, in light of climate change, is measuring and determining the availability of water resources.[289] However, much more is required of an agency in a changing climate, particularly if the goal is to respond to these changes in an ethical manner.

For instance, one key area of freshwater resource management that needs to be strengthened before greater hydrological changes is a better management during periods

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[288] JORGE CORREA SUTIL & MARÍA ANGÉLICA JIMÉNEZ, SISTEMA JUDICIAL Y POBREZA–ESTUDIO SOBRE EL ACCESSO A LA JUSTICIA EN ARGENTINA, CHILE, PERÚ Y VENEZUELA 46 (1997) (emphasis in original).

[289] Fija Texto del Codigo de Aguas, art. 299 (Decreto con Fuerza de Ley Número 1.122).

of drought. Recall that under drought conditions the Water Code allows for water rights holders to first attempt to redistribute water among themselves before the DGA has authority to distribute water resources.[290] As climate change reduces the availability of water, the redistribution process among water rights holders could become more contested as stakeholders are competing for fewer resources. However, water rights holders may have greater incentive to reach an amicable allocation of water in times of drought in order to preclude the DGA from stepping in and allocating water resources for the public use. Ethical implications arise when private rights holders are able to allocate water resources without the public interest being protected.

Coordinating Multiple Users and Absence of a Priority System

The lack of coordinating multiple users in a riparian system is not, by itself, an ethical concern. The ethical problem arises in the Chilean management scheme because the absence of a priority system is coupled with the privatization of water rights, a free market enterprise, and the severance of water from land rights. The Water Code also fails to efficiently manage multiple water users. The inability to administer competing water uses and needs ultimately leads to ethical dilemmas as the market system excludes those who do not have the capital to participate. One means to balance the needs and demands of various stakeholders is to establish a priority system. A priority system can regulate which users have superior claim to water, such as the prior appropriation

[290] *Id.* art. 314.

doctrine used by western states in the United States, using the "first in time, first in line" principle. A priority system can also be enforced during times of shortage.[291].

One drawback to a priority system is that "it can freeze existing uses that no longer reflect changing societal values and the importance of aquatic ecosystems."[292] For instance, the priority system under the prior appropriation model in the western United States has frozen some senior uses where the use is of low-value. This is problematic in that it can "inhibit or prevent the transfer of water from lower- to higher-value uses."[293] A priority system does not need to be modeled after prior appropriation where particular users are given seniority. Rather, an ethical framework can decide which categories of use should receive priority over other lower-value uses. Currently, Chile's Water Code does not employ any priority system and instead leaves priority to be determined by water rights holders through the free market.

Severance of Land and Water

The severance of water rights from land rights has been an important component in the disproportional access to water rights in Chile. Decoupling land and water rights can be beneficial by permitting water to be transported to areas or populations in the greatest need without legal barriers, which can promote an ethical approach to water

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[291] *See* AM. SOC'Y OF CIVIL ENG'RS, REGULATED RIPARIAN MODEL WATER CODE, ASCE/EWRI § 6R-3-04 (1997).

[292] Adler, *supra* note 272, at 24.

[293] *Id.* at 25.

management. Severance of land and water therefore may be an important component to freshwater resource management for climate change since flexibility and transferability will be increasingly important.

However, severance of water and land does not assure that water will in fact be transported to regions with the highest need. Furthermore, in Chile decoupling plus absolute ownership over water rights has lead to the intrusion of new stakeholders into communities with water but without capital. As Boelens describes, "[d]ecoupling water rights from their territory or community opens the door for scenarios in which local communities are confronted with new, nonlocal water interest sectors and powerful enterprises."[294] This decoupling is particularly problematic where large water consuming companies, like mining or bottling companies, are able to move into a community and buy water rights even though those waters might flow through the community's land.

Absolute Private Ownership

In the process of acquiring and using a right, water rights holders have no limitation on how that water can be used. In other words, the ethical concern is that rights holders do not have to use water productively or even efficiently to maintain their right. For example, if a mining company makes an application for a water right, according to the Water Code, the company is not required to justify or explain how they will use the requested water. When the right is obtained, there are no legal requirements

[294] Boelens, *supra* note 279, at 110.

that the mining company must actually use that right, which in turn can lead to speculation and water hoarding. Scholars have noted that this "tendency of concentrating water rights in the hands of a few commercial companies can be noted with the development of mining activities in the dry northern region."[295] Although the 2005 policy reforms tried to address speculation by imposing a tax on unused water, a tax may not serve as enough of a deterrent. Rights holders that likely to engage in water hoarding or speculation may be able to afford the tax. In addition, according to a cost-benefit analysis, the increase cost in hoarding rights may be worth the additional cost to assure water availability, particularly with water scarcity as a growing concern.

Not only is speculation a concern under the Water Code, but also the code does not require rights holders to use water in a beneficial manner. Under the prior appropriation model, users are required to put water to a "beneficial use." The rationale behind this policy is that water is a finite resource and societies will benefit more if users put water rights to a productive use versus water being wasted. The concept of what qualifies as "beneficial use" is ambiguous and is defined differently by each state that uses the prior appropriation model. In Chile, however, if a mining company wanted to use their water right to engage in wasteful activities, such as using water to exterminate vermin, they can and no governing body could cancel their rights for doing so.[296] A beneficial use doctrine would encumber the absolute private ownership established by

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[295] *Id.* at 111 (citing to Jan Hendriks, *Water as Private Property: Notes on the Case of Chile*, *in* SEARCHING FOR EQUITY 308 (Robert Boelens & Gloria Dávila eds., 1998)).

[296] This example is a play on the famous water law case in which California's Supreme Court is trying to determine whether an alfalfa farmer was putting his water to beneficial use when using water to kill gophers. *Tulare Irrigation Dist. V. Lindsay-Strathmore Irrigation Dist.*, 45 P.2d 972 (Cal. 1935).

Chile's Water Code and require a constitutional amendment. Nevertheless, the doctrine would be a means to ensure protection of the public's interest in water and because "beneficial use" can be defined by diverse social norms, this doctrine could thus also serve as a means to protect local and cultural values in water resources. The key in constructing an ethical framework utilizing the beneficial use doctrine, however, would be to ensure "beneficial use" be culturally defined.

Chile does not impose a beneficial use requirement on water rights because holders enjoy an absolute ownership of water. Absolute ownership also allows holders to change the use of their water right. Water management models that prohibit a user from changing water do so in order to protect the interest of third parties. In the Chilean model, even though the code does not expressly prohibit a change in use, how a water right is defined by the code (e.g. consumptive versus non-consumptive and continuous, discontinuous, or alternating) somewhat limits the water use to the extent where a drastic change in use is not a concern. For instance, a hydroelectric company that has a continuous non-consumptive use cannot suddenly switch from using water for hydropower to agriculture, which is a consumptive use of water, as this change would violate the scope of their water right. However, the definition of a water right does not preclude a rights holder from selling, transferring, renting, or leasing a water right to another individual, which then allows a change in the nature of how that water is put to use.

A flexible change in use policy, like the one in Chile, is necessary for an ethical framework for water resource management. This is because a flexible and liberal change

in water use water policy is beneficial for two reasons. First, many traditional Andean communities freely exchange water as part of cultural traditions. Historically, these communities socially, rather then economically, transferred and exchanged water rights to maintain a network of friends and relatives; likewise, a community's identity might have been constructed around the struggle against landlords and water and land rights; communities have also benefit from water transfers by consolidating identities and togetherness through years of collaborative water management and building water infrastructure.[297] Second, any nation or community trying to respond to changing hydrological patterns due to climate change will benefit from the flexibility and adaptive character of changing water uses.

Diminished Collective Management

Chile's amalgamation of legal principles has engendered a system where individuals are much less likely to collaborate over water resource decisions and conflicts, and instead, individuals are more likely make decisions based upon protectionist measures and turning profit. For instance:

> ...[In] valleys and oases of the North Chilean desert where the scarcity of water could, in principle, be expected to induce a well-organized and quite solid organization, collective systems of operation and investments have either severely eroded or stopped to exist. Farmers are claiming their individual rights, but collective control is vanishing, and general assemblies and community decision making disappear.[298]

[297] Boelens, *supra* note 279, at 109.

[298] *Id.* at 112-13.

The availability of water resources are diminishing because the free-market system incites fierce competition among rights holders rather then collective management. As one author explains:

> [T]he current policy does not foster interuser collaboration and local-level resolution of rights-related conflicts. On the contrary, the policy provokes and generates tensions, and severely undermines existing collective arrangements to deal with and settle conflicts. Intrasystem rights, which formerly were rooted in localized normative systems and strongly embedded in local intuitions and social networks, are now eroded through their increased dependence on market and on state legislation.[299]

Once local interest in collective water management vanishes, a chain reaction occurs throughout the communities. For example, water rights holders with little economic or political power, like low-income farmers, are less interested in investing in a system where there is no collective assurance and there is no protection against an outsider, like a mining company, acquiring a right to the detriment of the farmer. As Boelens succinctly summarized, "the more individual owners of water, the fewer owners of the system."[300]

The Water Code has created a number of other ethical problems, many of which cannot be adequately explored in this short analysis. For instance, the Water Code contains no instream flow provisions, which are important to preserve riparian ecosystems and prevent the DGA from allocating every last drop of water to users. An ethical framework will not only address the human needs of water, but will also address environmental needs since a healthy ecosystem is a prerequisite to clean water. Additionally, an ethical framework should explore ways to govern groundwater and

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[299] *Id.* at 112.

[300] Hendriks, *supra* note 296, 306.

surface water as one system through "conjunctive management."[301] Although these hydrological systems are connected, water management models govern them separately. These few issues, among numerous others, are ripe for further study in order to determine how they might be best structured for an ethical management of freshwater resources.

Drawing from the legal analysis and case studies of Chile, two broad principles can be summarized regarding the ethical management of water resources that can be applied to any conversation about water ethics. Keeping in line with earlier criticisms about a universal ethic, neither of these principles risks homogenizing cultural values. First, the Chilean Water Code delinks water from culture by pushing a universal water management structure. Consequently, populations who are unable to or consciously resist assimilation experience great inequity in access to water. Second, the inherent public nature of water precludes the absolute ownership of water. Naturally, then, when a public good is legally defined as an economic commodity, ethical problems ensue.

[301] Conjunctive management is a "program [that] coordinates the use of groundwater and surface water." Ruth Langridge, *Confronting Drought: Water Supply Planning and the Establishment of a Strategic Groundwater Reserve*, 12 U. DENV. WATER L. REV. 295, 316 (2009).

CHAPTER VII

THE RISKS OF A UNIVERSAL NORMATIVE AUTHORITY GOVERNING FRESHWATER RESOURCE MANAGEMENT

The purpose of this thesis is not to isolate Chile's Water Code as the precedent of how not to ethically manage water resources. Rather, this thesis aims to extract general ethical dilemmas from Chile's paradigm that may resonate with other freshwater resources management models in order to contribute to future public policy decisions regarding freshwater management. To accomplish this goal, this final chapter shifts the discussion of ethical concerns of water resource management away from the near scientific and detailed analysis of Chile's water laws to a discussion of formal institutions, agents, and implementation of water management. The result is a discussion that conceptualizes ethical concerns of national water management paradigms in terms of discursive and political powers.

The goal of this chapter is therefore two-fold. First, it is to explain why Chilean water policies are incongruent with ethical principles from a normative perspective. Second, this chapter ties together legal principles of ethical freshwater management with cultural norms so as to promote ethical doctrines of management.

Water Resource Management Discourse

Although water laws are about managing a natural resource, water laws are equally about shaping human behavior in regards to water. Because water is a critical component of human lives and experiences, water laws also shape human behavior in general. Those who are in a position to create and enforce water laws are ultimately constructing a paradigm that is both inclusive and exclusive by determining such things as who has access, who has a legally recognized interest, and what uses are given priority. Water laws are thus, on one level, about power. By defining who can and cannot have water, water laws are capable of denying claims to water rights. In Chile, as in so many other countries around the world, the government creates the laws and procedures to allocate water rights. When water laws are constructed under a universal norm, water users are perceived and therefore treated as homogenous. A universalist vision of water resource management "erase[s] normative differences altogether."[302] As a result, universal water laws can fail to incorporate diverse concepts and values of water, especially if those diverse uses do not coincide with norms promoted in the paradigm or policies. In Chile, an example of water user homogenization is seen in the comparison the indigenous communities to mining companies. Both are treated equally under the 1981 Water Code although their water needs and demands are drastically different. Whether the intentional or not on the government's behalf, forcing various normative

[302] Paul Schiff Berman, *Global Legal Pluralism*, 80 S. CAL. L. REV. 1155, 1189 (2007).

orders to operate under a universal paradigm denies the existing "diverse management approaches and socio-legal repertoires for regulation of water control."[303]

Water laws construct and promote a particular vision about national culture, particularly when those laws impose only an official norm. For Chile, that norm is that economics dictate water use, which is a politically contrived norm that was constructed as a response to the failure of Chile's second Water Code of 1967. These laws then, because they guide human behavior and, as illustrated through the case studies, impact cultural survival, are very influential tools to promote a national culture and a political agenda set forth by a sovereign entity. According to sociologist Stuart Hall, who studied cultural theory, "[t]he formation of a national culture...generalized a single vernacular language as the dominant medium of communication throughout the nation, created a homogenous culture and maintained national cultural institutions."[304] Consequently, Chile's national paradigm is the main authority on water resource management not only because they are backed by formal sovereign power, but the Chilean Water Code also promotes a concept which produces meaning.

A water regime promoting only one water culture norm maintains legitimacy, and therefore power, through defining water rights which inevitably excludes certain users and uses of water. In Chile, those excluded are the indigent and other disadvantaged groups. Once formal legal processes define social and cultural norms, the universal water

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[303] Rutgerd Boelens et al., *Special Law – Recognition and Denial of Diversity in Andean Water Control, in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 146 (Dik Roth et al. eds., 2005).

[304] Stuart Hall, *The Questions of Cultural Identity, in* MODERNITY: AN INTRODUCTION TO MODERN SOCIETIES 612 (Stuart Hall et al. eds., 1996).

paradigm is then able to maintain formal legitimacy by creating and perpetuating a powerful myth about legal superiority that penalizes communities that do not fit within that discourse. Communities that harbor norms different then those imposed by the water resource management paradigm are excluded because the universal approach to water management is presented in terms of truths that ignore diverse water culture norms. Boelens critiques this aspect of the Chilean Water Code when he wrote, "[n]eoliberal thinking refers to universal and natural truths about how water and money flow, and about how humans behave. Rather than being rooted in local specificity, it preaches that water management should be based on universal and global truths."[305]

While diverse norms are no less valid then the universal norm, the diverse norms simply are not legitimized by the sovereign's formal legal processes. Denying diversity, which is the process of exclusion, is then perpetuated is by myth that the universal water resource paradigm is "'modern,' 'efficient,' and [a] 'rational' [mode of] management."[306] Imposing a legal regime that embodies only one water culture norm upon the diverse communities that compose a nation presupposes that all water users have identical needs and demands. The Chilean Water Code very much assumes that all users will display the same behavior, a concept that is rooted in the Enlightenment tradition:

> An important belief that fuels new water policies is that the behavior of water users and managers follows incentives that are largely determined in institutions and markets. The outcome of organizational and political processes in water

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[305] Rutgerd Boelens & Margreet Zwarteveen, *Anomalous Water Rights and the Politics of Normalization: Collective Water Control and Privatization Policies in the Andean Region, in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 107 (Dik Roth et al. eds., 2005).

[306] Boelens, *supra* note 304, at 146.

> management are seen as the sum of rational decisions made by individuals, based on interests which can be objectively defined and known by outside analyst.[307]

The process of managing freshwater resources under one paradigm requires everyone to have a similar relationship to water, which thereby constructs an "imagined community."[308] As a result, water users become homogenized just like the law itself because everyone is treated uniformly.

Users who have different values and norms in regards to water than the universal sovereign supported regime, for instance those who value water for something other then its economic worth, must adapt to the sovereign's norms or risk having no legally legitimate claim to water. Framed differently, diverse water cultural norms must assimilate to the universal paradigm for water resource management. Resisting assimilation brings labeling. For instance, communities like *campesinos* or indigenous groups that attempt to maintain traditional use or management of water may be perceived as "backward," "inefficient," or "antiquated," labels that project opposing values of Chile's water regimes. In addition, these labels perpetuate the myth that a universal approach to water management is the best or most appropriate means to natural resource management.

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[307] Boelens, *supra* note 306, at 105.

[308] BENEDICT ANDERSON, IMAGINED COMMUNITIES: REFLECTIONS ON THE ORIGIN AND SPREAD OF NATIONALISM 6 (1991); *see also*, Hall, *supra* note 305, at 613 (discussing the construction of a national identities is an "imagined community").

The greatest myth perpetuated by Chile's water model is the concept of equity.[309] The argument that Chile's Water Code promotes equality goes something like the following: under a centralized management of water resources, every individual has an equal opportunity to participate in the system and everyone is treated the same as the code does not differentiate between users. Those that choose not to participate in the market do so on their own accord. Treating individuals as equal, however, erases diverging social and cultural meanings tied to water. According to Boelens, the equality myth is both extremely effective at promoting a universal norm and simultaneously detrimental to traditional communities:

> This ideology delegitimizes water management according to autonomous local norms and organizations. Problems of water distribution that are grounded in ethnic identities and social relations thus get reduced to mere questions of inclusion and exclusion. Consequently, it is often concluded that occurring problems are caused by the indigenous and peasant communities' backwardness and lack of access to official legislation, since these population groups are fixed to their traditional water management systems and lack modern inputs and education…[T]hey are considered marginalized and excluded from the general normative system, and consequently from social benefits of national society.[310]

While the Water Code proclaims to treat individuals equally, private ownership of water rights institutionalizes social differentiations and inequality.

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[309] *See* Boelens, *supra* note 306, at 118 (discussing that the assumption of equality "is crucial, since markets and meetings only function when all participants can interact as equals.").

[310] Boelens, *supra* note 304, at 147.

The Contested Nature of Water Rights and Ethical Solutions

Analyzing the ethical implications of freshwater management emphasizes a few important points that are worth reiterating. First, because water is a natural resource essential for life, politics and water cannot be divorced from one another and water resource management will never truly be objective or neutral. This is not necessarily a bad thing so long as water resource management is a balanced and equitable process. But the political nature of freshwater resource management can be problematic because, as one author points out, "[s]ome (groups of) people are better situated than others to secure access to water, to control water resources, and to determine water discourse."[311] To ensure that groups are not abusing power differences, an ethical framework requires those who are better situated to recognize power differentials between users and strive to ensure equality across stakeholders.

Second, water laws are as much about managing natural resources as they are about defining social and cultural relationships: "At any location and in any point in time, existing repertories of water rights and laws are expressions of, and dialectically constitute, social and economic relationships between people. Therefore, proposed changes in such laws and rights always entail changes in these socioeconomic relationships."[312] An ethical framework moves this process forward as it conceptualizes social and cultural norms.

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[311] Margreet Zwarteveen et al., *Water Rights and Legal Pluralism: Beyond Analysis and Recognition, in* LIQUID RELATIONS: CONTESTED WATER RIGHTS AND LEGAL COMPLEXITY 257 (Dik Roth et al. eds., 2005).

[312] *Id.*

In the concluding remarks of the book *Liquid Relations*, the authors discuss the four ways in which water rights are contested. A legal framework that incorporates considerations about water ethics will carefully and honestly examine each of these points of contest because these four areas are the same areas where water ethics are lacking. First, water rights are contested "because they deal with decisions about the distribution and allocation of a very important resource."[313] Second, is the contest "over the contents of rules, norms, and laws that determine water distribution and allocation."[314] "A third way in which water rights are contested relates to struggles over who decides about questions of water distribution."[315] The final "area of contestation lies in the discourses used to articulate water problems and solutions."[316] Ethical solutions to these areas of contest should have the overall goal of promoting diversity and pluralism in a way that does not simply insert marginalized populations into bureaucratic or standardized management norms, but in a manner that also promotes empowerment.

There are many strategies for an ethical reform. These suggestions, however, only address procedural processes as substantive ethical reforms must be defined by the communities themselves. The ethical procedural recommendations are:

> Identification of interest groups, analysis of problems, needs, and potential assets of least favored groups, interactive action research, facilitation of networks and horizontal linkages (alliance-building capacity), facilitation of negotiation forums

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[313] *Id.*

[314] *Id.*

[315] *Id.* at 258.

[316] *Id.*

> accessible to the least powerful groups, preparing them (demand- and proposal-making capacity), and institutional backing in these platforms....[317]

A clearer or more defined solution cannot be given because an ethical approach to water management ultimately draws upon local cultural and social norms. Creating a universal water ethic or a list of ethical legal provisions for governments to adopt and enforce would be perpetuating the process of normalization and power that this thesis strongly argues against.

Debating a Pluralist Paradigm of Freshwater Resource Management

Because Chile's water laws are incongruent with communities' relationship with water, the socio-political environment in Chile is ripe for resistance or struggle. The severity and amount of resistance will only increase as climate change alters hydrological systems and makes water resources even scarcer. Governments or legislators, when confronted by the possibility of civil society fracturing and resisting law, are likely to reform laws or add new legislation to address the source of the dissidence since resistance causes law to lose legitimacy. What has developed from this civil unrest in Chile are laws that address customary or traditional needs and are legitimized by national institutions. The Indigenous Law is one such law.

The recent Chilean Supreme Court decision that used the Indigenous Law to protect water for the Aymara people can be viewed as an example of a pluralist approach

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[317] *Id.* at 266.

achieving a more ethical solution to current and future water supply shortages. Nonetheless, there are valid criticisms regarding the proposal that a hybrid legal framework is a viable solution to fix current water policies. First, a pluralist model is impractical to administer. Prior to the recent Supreme Court decision regarding the Aymara's water rights, one scholar denounced the Indigenous Law as a "dead letter,"[318] existing only on paper but not in practice. However, the Supreme Court decision breathed life into the law and created a Water Code with pluralist legal spaces. Nevertheless, to enforce the law and coordinate the overlapping and contradictory nature of pluralist legislation, that is the Water Code versus Indigenous Law, required judicial activism. For the Aymara, it took the Supreme Court to harmonize the two pieces of legislation. Fortunately, the current Chilean Supreme Court favors environmental laws and is known to use pre-existing legal principles to protect the environment.[319] Yet, having a favorable Supreme Court is not a long-term legal solution to the ethical concerns embedded in Chile's water model since the majority of cases never reach the Supreme Court, and the priorities of the Court can shift with the Court's composition.

A second criticism in promoting a pluralist legislation model to address ethical concerns is that supplemental laws only fill the ethical gaps created by the universal water model. In other words, the Indigenous Law is not a solution to the disparate impacts of privatized water in Chile, but instead a ruse granting indigenous people no

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[318] Boelens, *supra* note 304, at 161.

[319] David Aronofsky, Professor, University of Montana School of Law, Address at the Public Interest Environmental Law Conference 2010: Unnecessary Risks and Unnecessary Dams: Patagonia's Wilder Rivers Under Siege (Feb. 27, 2010).

more power or autonomy over water management then they had before the law was enacted. Additionally, the Indigenous Law is not a solution for all the populations disproportionately impacted by the Water Code. For instance, poor farmers have no legal remedies or protection under the Indigenous Law. The only way to address the other communities affected by the code is to pass legislation for those specific communities. However, this presents a larger problem. If legislators simply draft new laws to fill gaps in ethical management without actually ever reforming the code itself, the Water Code would lose legitimacy and be rendered valueless if too many dual laws exist. And lastly, the Indigenous Law is a "concept of 'indigenousness' and disregards the dynamic nature of identity, local rights systems…and cultural diversity."[320] In other words, the Indigenous Law is a neoliberal construction of indigenous water rights, not a self-defining indigenous model of water resource management. To truly be an ethical framework, disadvantaged populations need to be part of the legislative process.

Third, the inability of this framework to produce a definitive list of solutions may be disconcerting to policy- and decision-makers. Yet, the source of this discomfort is the root of the ethical dilemmas. The discomfort arises from the inability to completely control and regulate water uses, or in other words, discomfort arises from the relinquishment of power. A central principle of water laws is to manage the natural resource in the most efficient and predictable means, and thus, not having a defined list of policies seemingly frustrates these two objectives. Remember, however, that climate change is going to change hydrological patterns in very locally specific ways. Allowing

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[320] Boelens, *supra* note 304, at 159-60.

local communities to have a voice in water management, therefore, may be more efficient in the long term.

Fourth, if an ethical model is not carefully constructed with the consent and participation of various communities and stakeholders, then an ethical framework can easily become a political tool to manage rather than incorporate the water needs of disadvantaged populations. In other words, the concept of water ethics would only exist in de jure as "equitable rules do not necessarily lead to equitable practice."[321] Take, for instance, Chile's Indigenous Law. Before the Supreme Court enforced the water rights enumerated by that law, the water rights were de jure. Following the Supreme Court's ruling, the water rights turned de facto. And fifth, an ethical framework that strives to increase access and control for disadvantaged populations will increase the number of legitimized claims to water. This approach may in turn lead to greater conflict as the framework would increase and diversify the stakeholders and introduce pluralist regulations that are incapable of interacting with one another.

As with current water models in effect, an ethical framework to manage freshwater resources will not be without its own complications and shortcomings. Since water is a contested resource, there will never be a perfect solution or a solution that all parties agree upon. Just because there are formidable challenges and hurdles to reforming water legislation to adapt to our changing climate and ethical concerns, does not mean these hurdles are barriers. To deny an ethical approach, or even ignore the obvious ethical dilemmas water management faces due to a changing climate thereby

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[321] Rutgerd Boelens, *Equity and Rule-making, in* SEARCHING FOR EQUITY: CONCEPTIONS OF JUSTICE AND EQUITY IN PEASANT IRRIGATION 30 (Rutgerd Boelens & Gloria Dávila eds., 1998).

maintaining the status quo power dynamics is a moral response in itself, and perhaps the moral response that we do not want to be associated with.

CHAPTER VIII

CONCLUSION

Constructing an Ethical Framework

Because an ethical framework derives its policies from context-specific and sociocultural norms, I am unable to produce a definitive list of substantive policies. Instead, the communities regulated by substantive policies must construct their own legal framework. I am, however, able to recommend generalizable principles and procedural mechanisms to ensure an ethical approach to freshwater resource management.

First, legal entities cannot have absolute dominion over freshwater resources. I am not advocating that all water resources must be managed as a public property in order to be ethical. Contrary, water should be available for private ownership still but limitations must be placed on those private rights so as sociocultural norms evolve and water availability changes, political entities will be able to recall those rights for the public good.

Second, an ethical framework must conjunctively manage surface and groundwater systems. Even though surface and groundwater are interconnected resources, current water management models regulate their uses separately and differently. In order for communities and political entities to make socially responsible water resource decisions, such decisions must consider both sources of water. For instance, it make very little sense to allow a private water bottling company to deplete

groundwater sources when water from that aquifer feeds into springs and rivers and is used by communities for drinking, agriculture, and energy. Third, water resources should be managed on smaller jurisdictional scales. Because climate change will impact hydrological patterns differently from region to region and because water ethics are often tied to place, managing water resources by basins will allow communities and political entities to make management decisions that best reflect their specific needs.

Fourth, an ethical framework needs to establish priorities. There needs to be both a meta-level priority system and also basin level priority systems. A priority system should avoid locking in water uses indefinitely as responding to the hydrological effects of climate change requires a high degree of flexibility. Fifth, water management models must include strong procedural safeguards to ensure equal access to information, civil participation, and transparency. Strong procedural rights will include robust conflict resolution services, institutions specializing in cross-culture communication, and processes for requesting a water right that account for third party harms, the public interest, and environmental protection.

The Benefits Derived From an Ethical Framework

Constructing an ethical framework will require resources, dedication, and perseverance because such comprehensive water policy reforms will incite a strong opposition. Nevertheless, the potential benefits of an ethical framework far outweigh these common legislative obstacles. For instance, an ethical framework will enhance

collective management because each community will be allowed to prioritize uses and define water needs. An ethical framework accommodates the multitude of claims to water and how these claims overlap one another, and consequently, an ethical framework is a more accurate and realistic understanding of the choices water users face.

Additionally, because divergent water ethics are often at the core of water conflicts, an ethical framework will reduce escalating conflict in a changing climate. I am not suggesting that an ethical framework will eliminate or preclude conflict, but rather I propose that an ethical framework will allow for conflict resolution to occur outside the traditional litigation approach. Using alternative modes of dispute resolution may also lead to settling disputes that would not traditionally be litigated and may resolve disagreements before they escalate.

An ethical framework also promotes the holistic management of water resources. Managing water resources on a smaller jurisdictional scale allows for very context-specific decision-making, and thus, an ethical framework presents an opportunity to conjunctively manage surface and groundwater resources. In addition, an ethical framework promotes cultural survival by fostering diverse water norms tied to sociocultural practices. Lastly, an ethical framework enables adaptive responses to uncertainties. These uncertainties exist in climate change, altering hydrological patterns, economic stability, political and social structures, and even cultural identity. In an era of vast uncertainties, legal models must be adaptable otherwise changes resulting from these uncertainties can render the model obsolete.

Concluding Remarks

The world is facing water crisis. Water is a valuable and exhaustible resource, but a resource that humans often treat as expendable and inexhaustible.[322] Legal regimes managing water resources are under considerable stress to allocate water resources and resolve conflicts in a rapidly growing and consumptive world. Global climate change will exert further pressure on these legal regimes to respond to and resolve problems caused by changes in hydrological patterns. Sovereigns and policymakers are obligated to respond to the water needs of society using the legal frameworks that are in place. However, if those legal frameworks do not address ethical concerns about water management, then any response to water management will have resounding ethical implications. Prevailing laws and regulations governing freshwater resources are not constructed to account for issues of equality or justice. The additional stress of climate change will only exacerbate the ethical conundrums of water resource management. Water policy reforms for climate change must account for ethical dilemmas not only for moral reasons but also to minimize conflict and ensure the stability of future civil society.

Currently, there is no ethical framework for managing freshwater resources. Scholarship in this field is beginning to explore several core principles that could be used to develop a universal ethic on freshwater management, but this is a very dangerous proposition as it risks eliminating the diverse and unique cultural values embedded in water. Losing these values leads to the loss of traditions, identity, and a way of life. A universal ethic is also undesirable because it will inadvertently lead to greater conflict by

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[322] ROBERT GLENNON, UNQUENCHABLE: AMERICA'S WATER CRISIS AND WHAT TO DO ABOUT IT 17 (2009).

delegitimizing water norms. Adapting water resource legal regimes to climate change will require its own set of considerations such as strengthening conservation measures, efficiency, and the transferability of water. Adapting water resource legal regimes *to ethically respond* to climate change necessitates its own considerations such as accounting for and legitimizing plural cultural and social values of water.

Water ethics is truly in its infancy as a field, and consequently, there is extensive work that can be done on this topic. Moreover, this thesis raises as many questions about water ethics as it provides answers. Thus, there are many research questions to explore using this thesis as a beginning point. For example, a next appropriate project could begin to formulate concrete procedural mechanisms to promote an ethical framework and look for case studies of such mechanisms in effect. Water ethics research should also examine what other segments of society are marginalized besides indigenous communities and peasants and explore why and how these populations are impacted.

On a final note, I urge legislators and policymakers worldwide to be proactive in thinking about water policy reform and ethical issues, and most of all, to use common sense. Water is a precious resource and must be treated as such despite legislation allowing water rights holders to waste it. Before water shortages reach catastrophic levels and we become further entrenched in our current inequitable and wasteful practices, water policy reforms must manage water as a valuable but exhaustible public resource.

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