

6-23-2014

# Environment, Rights, and Waste in Bolivia: Addressing Water and Sanitation Processes for Improved Infrastructure

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Environment, Rights, and Waste in Bolivia:  
Addressing Water and Sanitation Processes for Improved Infrastructure

by

Maryann R. Cairns

A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
Department of Anthropology  
College of Arts and Sciences  
University of South Florida

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Date of Approval:  
June 23, 2014

Keywords: water supply, wastewater treatment, international development, NGOs, Bolivia,  
political ecology

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## ACKNOWLEDGMENTS

This study was made possible by funding from the University of South Florida (USF) Department of Anthropology, the USF Institute for the Study of Latin America and the Caribbean (ISLAC), the USF Research That Matters Scholarship, the NSF Research Fellowship “Sustainable Water Management Research Experience in Bolivia: Influence of a Dynamic World on technological and Societal Solutions” (Grant No. 0966410, PI: James Mihelcic), logistical support from James Mihelcic, Gabriella Gemio, and Nathan Reents, and the many people in La Paz and Sapecho who shared their time and thoughts with me. Thank you also to *Universidad Tecnológica Boliviana* for all of the support on-the-ground, and for welcoming our team to Bolivia with open arms.

Thank you to my committee for all the guidance and support. Thank you to Elizabeth Bird for ensuring that I always had a supportive mentorship environment, for honing my human rights knowledge, and for giving me the confidence to take risks and to pursue new research interests and methods. Her guidance and example has made me sure of what kind of scholar I want to be. Thank you to James Mihelcic for introducing me to fieldwork in Bolivia, supporting my language training, believing in me enough to let me be the anthropologist amongst his many engineers, and for forwarding my work and insights within an interdisciplinary environment; to Rebecca Zarger for ensuring that my work in political ecology was both theoretically grounded and applied, as well as for spurring my intellectual curiosity and including me in many of her ongoing projects; to Linda Whiteford for strengthening my regional focus and for enthusiastically encouraging my technological pursuits; and to Michelle Hughes Miller for her support on gender, structure, and critical development.

Thank you to Matthew Verbyla and Erin Symonds, my partners in interdisciplinary crime

for both this and many other projects, to Paola Gonzalez and James Arango for all their support as research assistants, friends, and colleagues at USF, and to Pablo Cezar Martinez Castro, Freddy Jamie Chalco Quisepe, Ross Eva Gabriela Gonzalez Khuno, Carla Andrea Quezada Mercado, Luz Claribel Copeticona Vargas, Juan Fernando Averanga Gonzales, Alison Morales, Fernando Averanga, Carmin Llanque, Claribel Capeticona, Jose Guzman, and Luiz Alfredo Cortez for their support as research assistants, friends, and Colleagues at UTB. Thank you to Natalia Guerra for all your support and teaching.

Thank you to all of the development professionals I worked with in La Paz for being welcoming, open, and enthusiastic about my work. Thank you to the people of Sapecho, your knowledge, your support, your time, and your hospitality were integral to this project. I am so proud to have been a part of your community for a short time.

Thank you to my family. Thank you to my dad for always being supportive, encouraging intellectual curiosity, and instilling a respect for other cultures. To my mother, thank you for teaching hard work, perseverance, study skills, and trust in other people. Thank you of course to my darling, wonderful little sister for being an enthusiastic springboard for harebrained ideas and for always supporting my many adventures.

To Neil, your support has been integral throughout my work. Thank you for encouraging my research, supporting my travel, and for answering my Skype calls at all hours. Thank you for teaching me mobile data collection technologies and for all your advice on how to manage a team and deal with unexpected situations in field research. Thanks for being you. I'm looking forward to all our many adventures in the future.

This material is based upon work supported by the National Science Foundation under Grant Nos. 0966410 and 1243510. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



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## LIST OF ABBREVIATIONS, ACRONYMS, AND INITIALISMS

**ACDI/VOCA:** Acronym only. An NGO.  
**aMe:** Action Monitoring for Effectiveness  
**AusAID:** Australian Aid  
**CBNRM:** Community-based natural resource management  
**CEDAW:** Convention on the Elimination of All Forms of Discrimination Against Women  
**DEC:** Development Experience Clearinghouse  
**DP:** Development Practitioner  
**EPSA:** Entidad Prestadora de Servicios de Agua Potable y Alcantarillado Sanitario, Service Provider for Sewer, Water and Health  
**FANTA:** Food, Nutrition, and Technical Assistance  
**FCDA:** Fondo Comunitario de Desarrollo Alternativo, Community fund for Alternative Development  
**FCDI:** Fondo Comunitario de Desarrollo Integral, Essential Community Development Fund  
**HR:** Human Rights  
**IWRM:** Integrated Water Resource Management  
**INGO:** International Non-governmental Organization  
**IRC:** International Water and Sanitation Centre  
**LCA:** Life Cycle Assessment  
**MAS:** Instrumento Político por la Soberanía de los Pueblos, Movement for Socialism-Political Instrument for the Sovereignty of the Peoples  
**MDG(s):** Millennium Development Goal(s)  
**MNR:** Movimiento Nacionalista Revolucionario, Bolivian National Revolutionary Movement  
**MPA:** Methodology for Participatory Assessment  
**Medair:** Abbreviation only. An NGO.  
**NBI:** Basic Needs Index (Created by ACDI/VOCA)  
**NEP:** New Economic Program  
**NGO:** Non-governmental Organization  
**OECD:** Organization for Economic Co-operation and Development  
**OSS:** Open Source Software  
**PCS:** Post-construction Support  
**PE:** Political Ecology  
**PEA:** Political Economy Analysis  
**PRA:** Participatory Rural Assessment  
**PSP:** Private Sector Participation  
**RWH:** Rainwater Harvesting  
**SFA:** Stochastic Frontier Analysis  
**SODIS:** Solar Drinking Water Disinfection  
**TEK:** Traditional Ecological Knowledge  
**UN:** United Nations  
**USAB:** Upflow Anaerobic Sludge Blanket  
**USAID:** United States Agency for International Development  
**WatSan:** Water and Sanitation  
**WASH:** Water, Sanitation, and Health

**YDI:** Yungas Development Initiative

**ZOPOCOA:** Zona de Conservación para Agua, Water Supply Conservation Area

## **ABSTRACT**

Water and sanitation (WatSan) development projects impact both natural systems and societal structures where they are placed. A complex process of development, including inter-governmental policies, aid agencies, personal relationships, and community politics enhance and constrain the efficacy of these projects. This study presents the many ways in which the WatSan development process has unintended and unexpected returns for certain community groups. Using a political ecology framework, I look at power structures, perceived and projected environmental impacts, multiple stakeholders, and individual discourses to critique how the “right” to water and sanitation is implemented in a specific community context. This project advances anthropological thought by showing a praxis-based study that links theory, on-the-ground, ethnographic experience, policy recommendations, and theoretical injections that relate to a variety of audiences, both within and outside of the academy.

The project is conducted in two main field locations—La Paz and Sapecho, Bolivia. I employ a mixed-method approach, including interviews with development professionals and community members, a survey of water and sanitation users, focus groups with particularly impacted groups (e.g. water committees, students, and women), and various mapping techniques (GPS mapping, community-led) to address the space and place within which this project was realized. I give specific focus to sewage collection and wastewater treatment, two elements of the WatSan system that are distinctive in this rural developing-country context.

WatSan development is not just infrastructure placement. It is a full process, a relationship. It comprises individual conversations, days of work, salaries, payment schedules, labor, expertise, and ongoing management practices. Individual perceptions of infrastructure efficacy, personal benefit, and best practices (both culturally and technologically) impact the

long-term effectiveness of a project. Major tensions arise post-implementation: between community and aid agency, conservation and use, labor and upkeep, and sanitation and potable water. There are multiple influences and positions subsumed in this process.

The study's political ecology approach, combined with foci on human rights, critical development, and water and culture, provides critical insights into the relationship between social and resource-based (water infrastructure) change. It looks at the ways in which the benefits and risks of a WatSan system are stratified, gendered, and power-laden. It further looks at the potential positive and negative outcomes of the system—all with an enviro-social focus. I look at how social and ecological relationships are tethered together (mutually constituted), how they are influenced by several levels of governance and policy. The experience of Sapecho shows how changes to WatSan environments can provide new water and sanitation access but in some cases, further engrain and exacerbate social inequalities. Provision of fresh water, sewage collection, and wastewater treatment infrastructure is not value-free—but it is necessary. This work tries to answer one small part of the question of how the right to water and sanitation can be best implemented in real-world situations.

## FOREWORD

My research focuses on the implementation and management of U.S.-funded water and sanitation systems in rural Bolivia. I designed my research to track the idea of water and sanitation (WatSan) as a human right from the international sphere to the local one; throughout I interrogate the process of water and sanitation development. My main aims are this: first to analyze how effectively development agencies act as a guarantor of the “right” to WatSan, and second to ascertain how well these systems are working in a community setting. I follow WatSan infrastructure, not WatSan outcomes—this is not a health-based study, and I won’t start any paragraph by discussing WatSan in terms of child mortality rates. I rest on the idea that WatSan systems, when implemented effectively, provide health benefits. I also rest on the idea that access to WatSan is a human right—that all should have access to improved water and sanitation to improve their wellbeing. My research fills what I see to be a major gap in research surrounding WatSan development processes—the human side of WatSan infrastructure.

I follow WatSan infrastructural design, development, implementation, and upkeep by critiquing the human side of these elements. Who is designing, who is developing, who is implementing, and who is maintaining these systems—and how does this human influence impact the effectiveness of infrastructure? I address the difference between infrastructural effectiveness (theoretical) and infrastructural efficacy (real-world). This means that I look at the realms of the socio-political and the environmental. I use a political ecology theoretical framework in order to set WatSan in a distinctly enviro-social realm. I also employ theories of human rights, development, and water and culture.

Throughout writing this work, I take the liberty of changing my voice to fit the “level” I am studying and of braiding several different data sets to provide multiple takes on one subject or theme. I work with engineers and development professionals—so I’ve included more graphics and visual representations of data than might be common in a traditional ethnography. My voice still guides these discussions, however. I haven’t edited the “me” out of this book. Furthermore, I’ve included many other voices (of participants as well as other scholars in the field) and have stuck to a healthy appreciation for narrative. The result is polyphonic and full—and, I hope, has something for readers from several different disciplines and career tracks. I do not write in the ethnographic present, but instead use past tense to address and encourage attention to the specific span of development projects and to expected changes after my work.

I have designed this work such that chapters can stand alone—each includes relevant information on methods, theories, outcomes, and findings. I’ve done this purposefully. Readers can comfortably zoom right to the chapter they want to learn about, and can then start again from the beginning. But the work does have a story arc, and can also be read cover-to-cover (mom, that way is for you). There is an introduction and a conclusion, and the final chapter—chapter 10—is the one that highlights a holistic applied approach to the “what’s next” from this data. The chapters in between build on one another—they trace the process of WatSan development from the construction of rights at the international level, through U.S. based development organizations whose aim is to provide water and sanitation infrastructure, continuing to the communities that are the beneficiaries of these complex systems, and finally to the local environment that absorbs the effects (either positive or negative) of the infrastructure’s response. They’re also vaguely linear, in that earlier chapters are more imbued with historical and theoretical setting and the latter chapters look toward future applications.

For ease of navigation, I’ve included a methods insert in chapter 2 (entitled “A Note on Methods”, and a project insert in chapter 3 (entitled “A Project Description”). These are targeted

and concise explanations of my methods and of the WatSan project, including the full methodology and full infrastructure studied in this project, respectively. I do not assume that the reader has any existing knowledge of either methods or WatSan infrastructure, so these inserts are comprehensive and include relevant definitions and explanations. The methods insert also includes an explanation of the technology that I used in my research. I employ technology extensively in my ethnography—in my survey, in my mapping, my presentation of data, and even my writing. I explain what technology was used, how, and why.

I will start this work by introducing and setting the research—traversing the many levels of my study. The introduction starts with a quick setting using thick description, which I have called “getting there.” My own intellectual and physical journey to my field site mirrors, in a way, the levels of my analysis, and thus is a good place to begin. The chapter also addresses the outline and plan for this dissertation in more detail.



## CHAPTER 1: INTRODUCTION

### Setting (Getting There)

*Every time I think about La Paz I feel the same tingly, light-headed, short-of-breath, stomach-full-of-Styrofoam feeling that you get when you land in El Alto airport on American Airlines flight 922. Thirteen-thousand, three-hundred and twenty-three feet above sea level just feels different than Tampa (where I live), and there is no getting around that. The fact that the flight lands at around 6 a.m. doesn't help matters, but it is what it is. The city of La Paz seems to tumble down the mountain like running water, the pavement winds through the neighborhoods and spits you and your taxi out onto a road wrapping and hugging the mountainside. You careen, not exactly softly, down through a million twinkling city lights, with the valley laid out below you and Illimani<sup>1</sup> (although you can't see it, because it is still dark) watching over the whole thing. The place seems to have stacked up like a stop-motion Lego movie, buildings jut at odd angles and seem half-finished. I can't say anything other than the ride in is beautiful, and intimidating, and if it wasn't already trouble to breathe—that sight would take your breath away.*

### La Paz

*La Paz is huge, electric, jumbled—and everything about it seems to be uphill, except for that one winding descent from El Alto. La Paz is home to the development personnel, the conference rooms, and the office staffs that dole out development funds for WatSan projects. There is Internet, a growing number of fancy coffee shops (with*

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<sup>1</sup> Illimani is a mountain that traditionally holds great cultural significance for the people of La Paz and of Bolivia.

*soy milk lattes and caramel mochas), and suburb-like enclaves for well-to-do expats and locals. There are gated communities, three-story houses, hot showers, grocery stores, and SUVs. Now, La Paz is also home to poverty, street children, marginalized groups, and social protest—but the point is that a development agency can make a comfortable enough home there, and its workers can live with guards and empleadas (local maid servants) in relative comfort. Most of those U.S. development personnel arrived in La Paz the same way I did, flight AA 922 from Miami. And, if they say the city didn't take them by surprise I'd doubt their sense of wonder.*

### **The Death Road**

*There are two death roads, the old one and the new one. They both connect La Paz to Los Yungas, my field site, and they both ride like they sound. The death road is a tiny rolling vein of flat dirt that is carved, painstakingly, out of the middle Cordillera Real mountain range. Looking up you can only see more rocks, and looking down isn't encouraged. But of course you do, and the thousand-foot drop is both beautiful (think a shiny river snaking through a green mountain valley) and utterly terrifying. The old death road has about enough width to allow one car to pass—so when the two-way traffic zips around the tiny shelf of the roadway where there have been more than enough accidents to feed the valley floor than were perfectly reasonable, you, well—you notice. The imminent danger of the passageway prompted the construction of the new death road, which is first and (most importantly) still in progress and secondly, not really all that much better than the first one. Sure, a couple of cars can make it past one another, but it is only open at certain times of day, and there are enough memorials stacked up on the side of the road to remind you that both cars don't always make it.*

*You always hope for just enough—not too much—rain, enough to pound down the dust so as to make the way visible, but not so much as to add further treachery*

*through muddy or slippery conditions. On most days, though, the dust hangs like a taupey-brown cloud around you, turning the green palms and trees (gripping with all their might to the road's edge) heavy and colorless with road dust. This is the road that everyone from La Paz has to take to get to Los Yungas, and the road that everyone in Los Yungas has to take to get to La Paz to sell their oranges or their wares. You feel that the road is well-traveled and well-worn, as if you're riding through a laugh-line on the face of the Bolivian landscape.*

*Nine hours down this road is where the little city of Sapecho is located. That is where the water and sanitation system that I study in this project (which was funded by USAID and implemented by a US-based NGO, ACDI/VOCA) was placed. All the materials, the plans, and the personnel for the project traveled down that road. I traveled that road, too - although, admittedly, I took that road with a couple of Dramamine, a nap, and a healthy appreciation of mortality.*

### **The Community**

*Sapecho shows up after that drive on the death road like a couple of shacks and a half-finished hotel on an empty stretch of dirt. The structures just seem to hang there in the night breeze. Only a few buildings face the main road, and even fewer are visible after dark. That town is sleepy and hard-working, and so there isn't much hullabaloo after 9 p.m., and definitely not after midnight, which is when one usually arrives after the schlep from La Paz. Sleepily you stumble, gritty with dust and sunscreen, into a tiny twin bed (with sweet-smelling hand-laundered sheets)– I usually don't even brush my teeth. The next morning you wake up, go outside into the fresh heat, and all you can see is green. Palms, lush tropical forest, rolling tree-covered mountains. And in the other direction stands the little town, home to about 200 agricultural families, and they've already been up for hours. This is the community that has worked with the development*

*agencies for years to partner in the plans for the WatSan system, which has elected a water committee, done all the days of work, and organized upkeep on the new and complex water system. They're also the ones that drink the water from the system, use the wastewater collection system, and manage the wastewater treatment plant.*

### **The Fresh Water Source**

*It is tough to get to see the water source. The water for Sapecho is sourced high up in the mountains, and the spring is a four-hour hike from town. Most community members don't know the way to the source—it is a winding, complicated, up-cliff climb. Only the operator of the water system both knows the way and is willing to take you there. One day, when he was headed up to clear the "trail" anyway, he let me come along. The town of Sapecho is often oppressively hot, steamy even. But as you get higher and higher up the mountain there is a cool mist. The trail is muddy and difficult, but there are beautiful trees, and helpful roots jut out when you have to cross a particularly difficult, slippery mossy rock next to a sheer drop overlooking a serious ravine. As you climb, you just try to keep up with the tiny, sinewy 60-something year-old man who is running up this mountain in flip flops like it is level ground.*

*You'll likely, like I was, seriously be concerned that you won't make it another hour on that hike, that you'll slip and fall and surely break something of great import, like a leg or something. And, you'll wonder—"does my cell phone work out here? Maybe if I fall down far enough." And, "I'm exhausted." And, "I wonder how anyone could ever, ever make this climb." But, as you're walking, the operator will likely tell the story of how the people of Sapecho carried concrete mix, plastic piping, and rocks up and down this mountain, how they created the catchment tank and laid the pipe. How they did it together, and that often they ran just to get the job done faster.*

## **The Wastewater Treatment System**

*Many of the homes that receive fresh water from the gravity-fed system are also connected to the wastewater collection and treatment system, which turns flushed shower, kitchen, and bathroom water into (ostensibly) a relatively pathogen-free effluent before it makes it to the river. The wastewater treatment system is much closer to town than the water source—yet somehow it is less known and less often discussed. It is tucked in the middle of a banana plantation, a bit of a ways behind a hotel on the far road. The land around the reactors, as well as on the outskirts, can be described as nothing but fecund. The place is beautiful, to get to the treatment system you take a hike that many tourists would envy. Jungle-covered mountains, misted in smoky cloudy haze, can be seen off at a distance. The sun shines through banana leaves and tropical flowers onto deep, rich, clay soil. Cacao plants hang heavy with big brown and white bulbs of deliciousness, some are on the ground split open—revealing the gushy white gummy fruit that cushions the cacao. A friendly bull lives nearby in a charmingly wooden-fenced-in area.*

*But really, you're standing five feet from lakes of human excrement, watching as little bug-colonized terds float along lazily on top of the water, you're watching the methane burn as it comes out of the big, round, cement block of a reactor. And your nostrils are filled with the odd combination of sunscreen, urine, rotting feces, mud, and greenery. And you're hopping around trying to get away from the ants that swarm everywhere, swatting at mosquitos and other buzzing creatures. And you're starting to figure out why no one wants to volunteer at the wastewater treatment plant, and why that infrastructure isn't exactly working so well.*

All too often, when we see reports or discussions about WatSan infrastructure projects in the developing world, we see only snippets of the lived experience of funding, implementing,

and managing these complex systems. Usually, in a quarterly report for a WatSan program I see a picture of a couple of smiling children next to a spigot, splashing the camera or drinking straight from the tap. Or I see pictures of women washing babies in basins. Now, I certainly have pictures of these scenes from my research. But a WatSan project is more than these end-goals. The bigger picture of WatSan is zoomed out quite a bit from these smiling faces. It is a process, one that includes the funding agency, the community, and a great deal of time. This research is an in-depth study of one WatSan project implemented in one community: Sapecho, Bolivia. This project was and is distinctive in that the scope of the work plan included potable water, sewage removal, and wastewater treatment infrastructure. My work is about the relationships between development, people, infrastructure, and the environment throughout the WatSan process.

### **The Project**

Water and sanitation system design and implementation in rural Alto Beni, Bolivia, was spearheaded by U.S.-based non-governmental organizations and funded by the U.S. Agency for International Development (USAID). My research focuses on WatSan infrastructure development and upkeep negotiated between these U.S. organizations and local communities. My aims are to ascertain how effectively development agencies acted as a guarantor of the human right to water and sanitation, to evaluate how well WatSan systems work in a community long-term, and to analyze the cultural, social, and human aspects of WatSan infrastructure's viability and efficacy.

My research seeks to answer the question of how the right to water and sanitation can be best implemented and sustained in community contexts. My research also specifically analyzes the differences in governance and practice surrounding potable water systems vs. sanitation and wastewater treatment systems. I use a suite of methods to gather data surrounding these processes and practices, including interviews with WatSan development

professionals, in-depth interviews with community members, focus groups with water management committees and target groups, systematic surveying of WatSan system users, participant observation, GIS mapping, and participatory community mapping. My data speaks to the many tensions that arise from WatSan development—national and international development politics, sustainability and conservation of resources, gender and ethnic discrimination, and the impact of development on lives and livelihood. My research discovers the many ways in which WatSan program expectations are not equal to WatSan outcomes, and provides a rich cultural context for these findings.

My research is informed by and responds to a combination of issues: 1) the lack of explicit cultural focus in WatSan development; 2) the lack of synthesis between NGO, engineering, and anthropological frameworks; 3) the need to close the intellectual “loop” between traditional and applied anthropological work; 4) the need to create a framework for WatSan-specific program monitoring and evaluation using anthropological knowledge; and 5) the need to translate anthropological knowledge to interdisciplinary and non-academic realms such as engineers and NGOs. My work is dedicated to providing an end product that will be at once critical and applied, the results of which can benefit the field of anthropology, national and international scholarship, and development initiatives. There are more calls for social scientists’ involvement in providing information about the process of WatSan and wastewater treatment (as seen in Singer 2012, Whiteford and Whiteford 2005) than there are specific studies related to the topic. I expect that my theoretical applications as well as my findings will begin to fill the very large gap in anthropological understanding of the WatSan process, especially regarding removal of sewage and treatment of wastewater.

My dissertation research, which secured IRB approval and was supported by NGOs and the target community, was completed in summer of 2012 (with pilot data collected in Summer of

2011)<sup>2</sup>. I completed semi-structured interviews with a purposive and referral sample of development workers in Bolivia (n=11) to examine the rights discourses and goals in place in their agencies, with specific attention to water and sanitation. This research took place in LaPaz, Bolivia. This stage helped to situate my questions to the local population vis-à-vis the goals and focuses of NGOs. Following that, I completed ethnographic research in Sapecho, including targeted, purposive sample<sup>3</sup> focus groups (n=4), purposive sample semi-structured interviews with community members (n=32), purposive sample mapping of community infrastructure, and a systematic sample survey of water users (n=138)<sup>4</sup>, community member-led heuristic mapping, and participant observation in households/community meetings. I further explain how purposive sampling was completed later in this chapter. I also employed participant observation methods during community meetings and to experience local behaviors and attitudes related to WatSan. Triangulation of these methods provides a holistic view of community perceptions (Bernard 2011). It is of utmost importance that I was able to incorporate the ethnographic reality of day-to-day life in Sapecho into my analysis. The intricate nature of relationships between and among individuals within the communities and the politics of class, power, and gender that are at play surrounding water use are best captured through participant observation. Through this method, I was able to integrate myself into day-to-day practices surrounding water in order to elicit an understanding of the cultural meaning of water along with the practices of water use. Thick description was used to provide a sound basis for the integration of the other methods within the study, and was a focus of my approach. Interviews were a major part of this participation, but I also worked to become a part of women's work (washing, cooking) and social

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<sup>2</sup> See Appendix 1 for an overview of the data that I collected during my pilot and its influence on my dissertation work.

<sup>3</sup> Purposive sampling allows the researcher to ensure that those who represent specific characteristics and/or who can speak to a specific topic are involved in the research (LeCompte and Schensul 2010:123).

<sup>4</sup> This sample size was chosen in collaboration with an anthropologist statistician who spoke to the need for ensuring survey-based response rates in small communities through utilizing systematic sampling (aimed at every other household). The study required a sample of at least 100. As mapping was used in conjunction with these surveys, the greater the coverage, the better the understanding of space-based influences on responses.



time for both genders. The project builds on pilot data, including a focus group with water committees (n=2) community interviews (n=6), and convenience sample surveys (n=320), completed in the Summer of 2011<sup>5</sup>. The research was supported by NSF and was completed in concert with engineering initiatives in the same area (PI: Dr. James Mihelcic).

## **Project Implementation**

What is often left out of WatSan projects' implementation is an understanding of the socio-political context in which development must take place. The human behaviors and actions necessary to maintain WatSan systems, local conservation consciousness, and the potential impact of the development process on the community at large must be respected and understood in order for WatSan systems to be effective and long-lasting. The existence of a water source, human water use, human defecation, and disposal of human waste are required in some fashion for all communities—but WatSan *technologies* are certainly not naturally-occurring. Each element of a WatSan project, delivery of potable water, removal of sewage, and treatment of human waste, has certain requirements and implies certain actions: natural resource(s)<sup>6</sup>, infrastructure<sup>7</sup>, technology<sup>8</sup>, and funding are required to implement such complex systems. Furthermore, working sanitation systems connected to centralized sewage systems require water access (Fuchs and Mihelcic 2011:133)<sup>9</sup>, and working potable water systems require water sources that are not heavily contaminated.

Thus, conservation of water systems through wastewater treatment is part and parcel to providing potable water and vice versa. WatSan technology implies development—you cannot have one without the other. WatSan in Bolivia cannot be removed from discussions of the

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<sup>5</sup> Completed in Both Sapecho, Bolivia and San Antonio, Bolivia.

<sup>6</sup> E.g. water, land, and construction components (rocks, etc.).

<sup>7</sup> E.g. human capital, time, construction.

<sup>8</sup> E.g. chemical processes, information sharing, engineering knowledge.

<sup>9</sup> Although in some cases sanitation technologies can work without water (Gleick 2003), these are not the sorts of systems that we are focusing on in this case.

impact of international aid, Bolivian government, or U.S.-based development through NGOs<sup>10</sup>, nor can it be removed from human rights (Goodale 2009). In the case of my research site, the WatSan system was designed and implemented by ACIDI/VOCA<sup>11</sup>, funded by USAID, and was approved by the Vice-ministry of Coca in Bolivia, and the *Fondo Comunitario de Desarrollo Integral* [Essential Community Development Fund] (FCDI) (Fuchs and Mihelcic 2011, Vargas-Carlos 2008). Through an anthropological approach I was able to link these various levels of influence with potential issues in sustainability of a WatSan project, and my methods were designed to meet the needs of this development process.

### **Focus on Sanitation**

Water has become “an urgent theme in anthropology” (Orlove and Caton 2010:401), and has a widespread and avid anthropological following. My focus on *water*, using theories of human rights, development, political ecology, and water and culture, then, rides on a wave of an already well-defined disciplinary trajectory, much of which actually centers on Bolivia (Assies 2003, Postero 2007, Wutich 2009a, Wutich and Ragsdale 2008, discussed further in the following chapters). My study will add to the study of WatSan in the way that I frame these water-based approaches and in the use of anthropological theory to discuss the impact of water in my particular ethnographic context. Most of all, however, my study will add to this literature by making sanitation a part of these dialogues.

Very few anthropological studies have focused on sewage and sanitation related to human feces and wastewater (Kendall 2005, Yacoob and Whiteford 1994). Kelly Alley’s ethnography *On the Banks of the Ganga* is the only full ethnography to focus on wastewater (Alley 2002). In her work, Alley notes that wastewater may have a “culturally neutral, unexotic appearance” that could be keeping anthropologists away (2005:24). It is Alley’s work that I look

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<sup>10</sup> The term “NGO” can be a bit nebulous. In my research I use the term NGO (non-governmental organization) INGO (international non-governmental organization) and GA (government agency).

<sup>11</sup> ACIDI/VOCA goes by the acronym and no longer associates the acronym with any set of words/company name (personal communication).

to as a touchstone for sewage and wastewater treatment in an anthropological context when looking at cultural meaning and politics of use. There are more calls for information about sanitation and wastewater treatment for social scientists (as seen in Singer 2012, Whiteford and Whiteford 2005) than there are specific studies related to the topic<sup>12</sup>. Much of my framework for looking at cultural concepts surrounding sewage and wastewater is borrowed from other disciplines (e.g. environmental engineering, and development studies, e.g. Lagergraber and Muellegger 2005, Pruss-Ustun et al. 2004, Wakeman 1995), from theories surrounding water use (e.g. if water is a “total social fact” so, too, is wastewater and sewage), or constructed anew. I expect that my theoretical applications as well as my findings will begin to fill a small part of the very large gap in anthropological studies of sanitation.

### **Ethnography in Practice**

Techniques and methods for monitoring and evaluating water and sanitation (WatSan) programs are varied and nonstandardized. Several different groups and organizations propose Monitoring and Evaluation (M&E) strategies and provide program feedback. *Monitoring* refers to whether or not a system has reached goals and promised elements of infrastructure/impact, and *evaluation* refers to linking the program, policy context, and outcomes of the project to wider issues<sup>13</sup>. Outside of development initiatives, several fields and scholars complete work that serves to explore the impacts and sustainability of complex WatSan systems. These initiatives, while perhaps not part of traditional agency-based M&E frameworks, provide the same types of information related to efficacy and effectiveness<sup>14</sup>. They also work to provide information to future WatSan programs. Environmental engineering is deeply tied to WatSan studies related to efficacy and effectiveness in rural areas (as seen in the work of Fry and Mihelcic 2010, Fuchs

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<sup>12</sup> Work on toxic waste such as that of Joslyn Cassady (2007), Barbara Rose Johnston (2003) is useful as reference for wastewater.

<sup>13</sup> This definition is compiled from the meaning of M&E for aid agencies (USAID, ACIDI/VOCA, UN websites). In this paper I use M&E to refer to project-driven/agency-driven monitoring and evaluation projects.

<sup>14</sup> I borrow these terms from public health, wherein efficacy relates to how a system would work in ideal conditions and effectiveness relates to how a system would work in real-world conditions.

and Mihelcic 2011, McConville and Mihelcic 2007, Mihelcic et al. 2007, Muga et al. 2009, Lundin 2000, Oakley 2010, 2005, 2004, Wendel et al. 2012). The fields of International development (Allen et. al 2006a, 2006b, Birkke 2000, Hubbard et al. 2011, Phumpiu and Gustaffson 2008, Solanes 2012, Wakeman 1995), geography (Castro 2010, 2008), urban planning (Davis 2005), and economics (Ferro et al. 2011) also provide insights into the influence of WatSan systems post-implementation. Anthropologists have been involved in M&E related to WatSan projects at the agency-level (e.g. Deal 2012, Deal et al. 2010), but their position is, as of now, by no means integral to M&E approaches. However, the call for heightened cultural and social awareness, especially in rural and indigenous settings, surrounding these issues has been clearly outlined (Alley 2012, 2002, Fry 2010: 98, Whiteford and Whiteford 2005). Applied anthropologists have no particular M&E strategies for specific water and sanitation programs in the realm of system sustainability (Churchill 2009), although methods have been suggested for health-based evaluations (Deal 2012, Deal et al. 2010, Yacoob and Whiteford 1994) and related to women's participation (Elmendorf and Isley 1983).

While exact methods are not set, anthropological approaches can certainly provide information related to WatSan issues that can be of use, especially related to social and cultural concerns stemming from system implementation. Still, as Allen et al. state, "... to a large extent, ongoing debates about the most appropriate institutional arrangements to deal with water and sanitation have little to do with ecological processes or *social practices*" (2006a:8). My aim here is to ensure that social practices (and ecological processes) are entered back into the debate and that anthropologists are clearly outlined as touchstones for this information. Chapter 10 specifically focuses on this goal.

### **Definitions of WatSan and Rural Technology**

It is important to unpack the term *WatSan* and to focus the discussion on the setting of WatSan as a transnational process of development between the U.S. and rural Bolivia. When

used in discussion, the idea of WatSan is loaded with a variety of meanings and spans several different aspects of water use and system construction. Here, I will define WatSan by dividing it into the three aspects that I cover in my work: 1) delivery/provision of potable water, 2) removal of sewage, and 3) treatment of wastewater. The first, delivery of potable water, fills the “water” portion of the term. Removal of sewage (2), and treatment of wastewater (3), are usually both subsumed under “sanitation” (Allen et al. 2006a, de Albuquerque 2009)—however I argue that these two aspects include differences related to personal use and infrastructure such that they require separate but allied attention in an anthropological context (I use the term “sanitation to refer to both together, but also discuss specific issues related to removal of sewage and treatment of wastewater). I also steer the discussion of WatSan to the context of my own work: specifically toward the setting of rural Bolivia where WatSan programs have included complex and communal infrastructure related to all three of these elements.<sup>15</sup> For reference, I do not focus on the removal of garbage waste in this paper, although this is sometimes also subsumed under the “sanitation” portion of WatSan<sup>16</sup>. I only discuss emergent concerns related to me by the population that concern garbage waste. Furthermore, while hygiene<sup>17</sup> is an important part of individual training and impact related to WatSan infrastructure, I address this directly as hygiene, and do not include it in the WatSan term<sup>18</sup> or explicitly in sanitation, other than when it comes to use practices of sewage removal infrastructure.

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<sup>15</sup> This introduction serves as just that—an introduction to the types of systems seen in Sapecho. The project insert after chapter 3 discusses this in more detail.

<sup>16</sup> For instance, the understanding of sanitation for the UN website is defined as “the collection, transport, treatment and disposal of human excreta, domestic wastewater and solid waste, and associated hygiene promotion,” whereas the IRC website defines it as “issues around human excreta: disposal, collection, treatment, transfer and re-use in whatever form.”

<sup>17</sup> Hygiene here refers to personal training related to the use of WatSan facilities for disease prevention.

<sup>18</sup> Water, Sanitation and Hygiene (WASH) is a common approach to this research area, but I do not subsume all of these under one term. I choose this specifically because Water and Sanitation refer to infrastructure while Hygiene refers to practice. I also chose not to include it in the WatSan term as my research is geared toward assessing the impact of infrastructure development and upkeep to a greater degree than health and health promotion (although of course this is discussed where relevant).

## **Delivery of Potable Water**

Delivery of potable water includes the procurement of fresh water sources and, ideally, efforts to remove pollutants and pathogens from that fresh water in order to make the water safe and acceptable for human consumption and use. In rural Bolivia, common applications of this include gravity-fed systems that may use sand filtration and chlorination and sand filtration (Franken 2007, Ministerio del Agua 2008). In my research site there is a gravity-fed system that is designed to employ chlorination (Fuchs and Mihelcic 2011, Reents et al. 2012)<sup>19</sup>, and this is what I refer to when I discuss fresh water provision.

## **Removal of Sewage**

This aspect is concerned with disposal of solid human waste through water, including excrement/feces and other flushed waste (black water). This also includes the infrastructure for collection of used water for showers, laundry, and other human use (grey water). Examples include (for rural areas in Bolivia) pour flush-latrines, condominal sewers<sup>20</sup>, and full sewer (large diameter) systems (Fuchs and Mihelcic 2011:124) In my research site this system includes “large diameter sewers” which are linked to the wastewater treatment facilities discussed below (Fuchs and Mihelcic 2011:124). This is considered a centralized rather than decentralized system for sewage removal.

## **Treatment of Wastewater**

This element of WatSan refers to treatment facilities for wastewater<sup>21</sup> which remove contaminants and decrease the possibility of environmental pollution and fecal-oral transmission of disease through de-contaminating wastewater output. Examples of treatment technology (for

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<sup>19</sup> For the purposes of my research, all three of these WatSan elements will be focused on a small-scale infrastructure (for a population of less than 2,000), wherein the system was implemented by an international non-governmental organization (NGO), ACDI/VOCA, funded by an international governmental organization, USAID.

<sup>20</sup> “Clusters of small diameter sewers leading to septic tanks, followed by gravel biofilter” (Fuchs and Mihelcic 2011: 124, Mihelcic et al. 2009)

<sup>21</sup> Wastewater here is defined as the combination of black and grey water carried by the sewage removal infrastructure.

rural areas) include septic tanks, absorption pits, upflow anaerobic sludge blanket (USAB) reactors, and facultative treatment lagoons (Oakley 2004, 2006, 2010, Reents 2012). For my research site the large diameter sewers are linked to a USAB reactor and treatment lagoons (termed maturation lagoons) (Fuchs and Mihelcic 2011:124)<sup>22</sup>.

The existence of a water source, human water use, human defecation, and disposal of waste are required in some fashion for all communities—but WatSan *technologies* are certainly not naturally-occurring. Each of these elements of WatSan has certain requirements and implies certain actions: natural resource(s)<sup>23</sup>, infrastructure<sup>24</sup>, technology<sup>25</sup>, and funding are required to implement such complex systems. Furthermore, working sanitation systems connected to centralized sewage systems require water access (Fry et al. 2008, Fuchs and Mihelcic 2011:133)<sup>26</sup>, and working potable water systems require water sources which are not heavily contaminated. These three system components of WatSan, then, also imply the existence of one another (Allen et al. 2006a, de Albuquerque 2009).

Thus, ensuring WatSan coverage requires the availability and the mobilization of many and differing aspects. This is why making WatSan availability a reality is related to several different levels of governance: transnational, national, regional, and local. Furthermore, this is why it impacts different aspects of society and culture: social, environmental, and economic. The chart that I designed (figure 1) gives a graphic representation of this discussion and outlines some of the questions related to WatSan infrastructure.

## Outline of Chapters

Each chapter in this work highlights a piece of the process of WatSan, and each can be

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<sup>22</sup> For more information on specific technology see Fuchs and Mihelcic 2011, Reents 2012, Muga and Mihelcic 2009, Vargas-Carlos 2008.

<sup>23</sup> E.g. water, land, and construction components (rocks, etc.).

<sup>24</sup> E.g. human capital, time, construction.

<sup>25</sup> E.g. chemical processes, information sharing, engineering knowledge.

<sup>26</sup> Although in some cases sanitation technologies can work without water (Gleick 2003), these are not the sorts of systems that we are focusing on in this case.

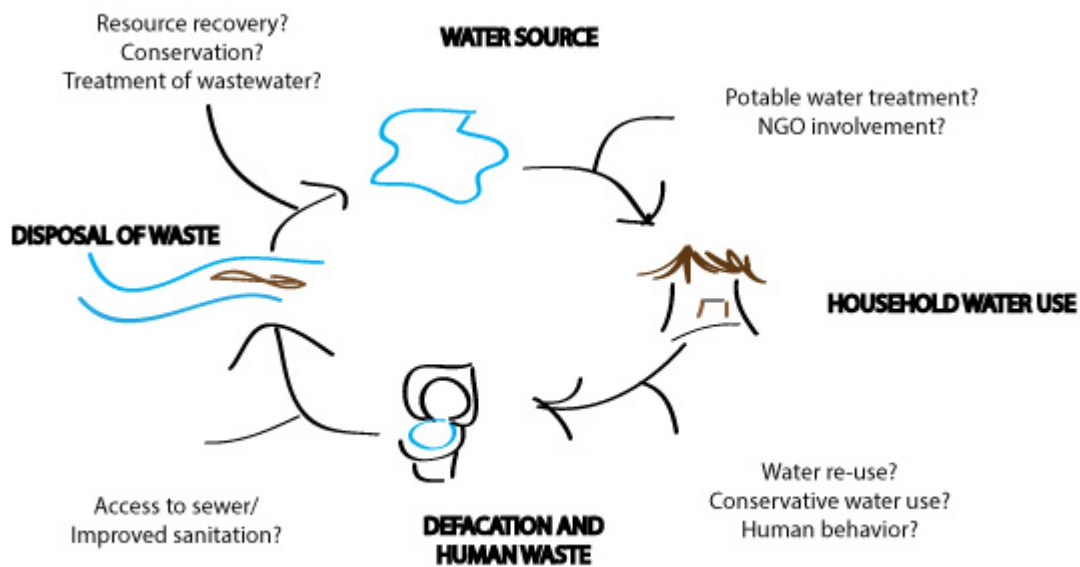


Figure 1: WatSan Cycle with Central Questions

read as a stand-alone view into a specific issue within WatSan implementation and management or as part of the larger work. Chapter 2 is a fusion of anthropological theory and contextual background for Bolivia’s development environment and WatSan landscape. It also outlines the relationship between the US and Bolivia as development aid donor and recipient nations, respectively. The section entitled “A Note on Methods” in Chapter 2 details my methods for the research in a digest format (methods are also included in content chapters).

Chapter 3 focuses on the realm of the governmental and non-governmental organization, and on the expectations of agencies that develop, fund, and implement WatSan systems in rural areas of Bolivia, and specifically in Sapecho. Chapter 3’s section entitled “A Project Description” focuses on the infrastructure project, detailing the design of the system, the plan for the infrastructure, all parties involved in the infrastructure’s development, monitoring and evaluation plans specific to the project, and relevant information about past USF studies and my pilot study in the region. This chapter is meant to present the infrastructure project as well as the USF grant’s relationship to the local community in a clear and concise section.



Chapter 4 focuses on the community setting of Sapecho, including overall demographic background, relationships between the area and aid organizations, and intersectionalities between WatSan and social life in the area. Chapters 5, 6, and 7 delve into the complex relationships between human WatSan management and WatSan effectiveness. Chapter 5 focuses on the tensions between water resource conservation and necessary use in the community. Chapter 6 focuses on the politics of equality in WatSan infrastructure upkeep and management. Chapter 7 delves into unique concerns related to sanitation and sewage collection in integrated WatSan systems. Chapters 8, 9, and 10 provide a suite of discussions which lead from an interrogation of the complex and multiple influences and positions in WatSan aid recipient communities (Ch 8), to conclusions of the work (Ch 9) and finally to a discussion of wider applications of the data, translations to the wider WatSan community, and calls for future research on the subject of WatSan (Ch 10).

## **CHAPTER 2: FUSION OF THEORY AND BACKGROUND**

Bolivia's WatSan landscape is culturally, socially, and ideologically specific—and the place of one small community, Sapecho, within that landscape, is even more distinctive. When framing my approach to WatSan research in the country, I found that a suite of theories worked best to form, analyze, and present my data (discussed in chapter 2's "A Note on Methods")—and that one main theoretical camp—Political Ecology—worked best as a main driver. Political Ecology frames my research as a whole. I gloss my research as a work which prizes a "Political Ecology of Water and Sanitation" approach (discussed in section 1 below). However, I also infuse my work with critical development theory, human rights approaches, and literature on water and culture in order to adequately enrich my findings with allied theoretical understandings of water, sanitation, and wastewater treatment—especially in regard to the process of WatSan development and community perceptions of these projects.

I chose Political ecology as the main driver for my work as it is particularly appropriate for concerns related to WatSan in both a social and ecological setting and as a factor which impacts enviro-social relationships. It also has a significant following within anthropology on the water side—including anthropologists who focus on water development projects (e.g. Johnston 2003, Derman and Ferguson 2003, Whiteford et al. in press: n.d.). Relating Political Ecology to sanitation, however, has been less practiced (Alley 2002), and thus one of the main contributions of this book is to present a political ecology of water *and* sanitation in a practice-based study of a specific community.

This chapter first introduces the main anthropological theoretical frameworks for my work

(further discussed and elaborated throughout this work as a whole) and then presents the situated background of Bolivia's WatSan landscape. These sections are presented here in this chapter together in order to explain the relationship between the theories and Bolivia, specifically. A write-up of theories and methods outside of anthropology directly follows.

### **Part 1: Theories for WatSan**

Political ecology (PE) is a broad-based framework that rests on theoretical underpinnings from several disciplines, most notably geography (Derman and Ferguson 2003). Although many credit different authors with coining and defining the term “political ecology” (Erik Wolf is a popular choice (1972) Robbins 2004, Walker 2005), it is Blaikie and Brookfield's definition that I find most clear—they define PE as a combination of ecological and political economic approaches, one which focuses on a “constantly shifting dialectic” between land-resources, classes, and groups within society (1987:17). PE is allied to the current of political and social critique and productionist/materialist interrogations (such as those seen in the works of Smith, Marx, and Weber (Robbins 2004). Influence is also felt from the hazards school<sup>27</sup> (Robbins 2004, Walker 2005:74). Political ecology is now ascribed with a variety of meanings and foci, including issues of power and politics, marginalized and disenfranchised populations, production models, traditional and environmental knowledge, and landscape-forward critical views (Robbins 2004:21-22). Political ecologists usually link to “a range of debates in Marxism, development studies, political science, and economics” (Alley 1994). However, Andrew Vayda and Bradley Walters' famous scathing critique “Against Political Ecology” claims “political ecology champions politics over ecology” (1999). Peter Walker, however, argues that this is an exaggeration (Walker2005:76), and I agree. My work does privilege the political over the ecological, but the point here is that I do include the ecological.

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<sup>27</sup> Which critically examined risk and management (Robbins 2004c:71).

## **Using Political Ecology to Link Anthropological Theory and Bolivia's**

### **WatSan Sector**

It is important to look at the *practice* of PE for more information on how it is employed—Walker states that early writings focused on the relationship between the capitalist political economy and the destabilization of human-environment relationships (2005:74). Paulson et al. find marginality, the pressure of production on resources, and plurality of positions as key themes in the application of political ecology publications (2003:205). Robbins highlights examples of the relationship between draught, famine, and the Nigerian state (1968-74), and argues that PE allowed for a robust examination of the crisis and its aftermath. He uses the work of Franke and Chasin (1979; 1980), who showed that a structural problem based in the production of peanuts, the resulting ecological and economic imbalance falling out from decreased prices, drought, soil loss, migration, and herd losses as an ideal example of how the approach can capture structural issues which extend beyond ecology or politics. He also holds up the work of Watts, who showed that marginalized groups had moved to growing more cash-rich crops and set aside their drought tolerant plants because of state subsidies. Here, within these themes and examples, we see the influence of global flows, state policy, and environmental change in context, and a beginning look at water as a key interest in PE. The use of political ecology as a form of engaged critique, which captures the web of enviro-social complexities surrounding complex issues is thus well examined in these analyses and others like them. However, how this critique turns to enviro-social change is less clear.

Robbins' focus on the hatchet and the seed approach, wherein the hatchet represents political ecology as critique and the seed positions political ecology as "equity and sustainability research" positions the discipline in an arguably applied context. This approach is in need of further development and has real possibility in terms of useful academic and practical outcomes. The goals of PE as regards critique and applied long-term sustainability approaches

is necessary more now than ever due to the complex and transnational nature of political and environmental effects. As Paulson et al. note, “developing an understanding of politics that goes beyond institutions of governance to encompass struggles over human practice, meaning, and representation in relation to the environment” (2003:213). is a key way to focus on power in multiple scales through PE. While ecological understandings are key to the approach, it is the political positioning of PE that holds relevance and need for growth in the globalized era. More of a political focus, one with policy returns, is necessary for the future of the theory and for the practice of PE in the long-term.

### **WatSan Applications and Bolivia-Specific Concerns**

The main contributions of political ecology, specifically the inclusion of critical examination of social-environmental interaction in terms of power and affairs of state, are particularly useful in research related to WatSan. I argue that the political system related to WatSan is the combination of an international political system pushing WatSan approaches, the discourses on environment and rights, national governments which regulate and allow aid work within their countries, the actual organizations that put the systems into place, and the community structure that absorbs and manages the infrastructure. All of these actions and discourses are linked to a series of environmental impacts which are either mitigated or exacerbated by WatSan infrastructure and sustainable development approaches. At this stage in the WatSan research environment, the intersection of the political and the environmental—wherein the process of socio-environmental impact is begun on the grand scale (interstate-level), but where the specific socio-ecological outcomes have not yet fully developed in the local context—is an excellent start-point. It is at this intersection that I use political ecology as theory through which I look at marginalization, risk behavior, property, resistance, aid relationships, colonialism, indigeneity, and production in terms of an environmental system (WatSan) in rural Bolivia. I agree that there is a “hermeneutic circle between global, regional, and local scales

and perspectives [that] benefits analysis on all levels” (Gezon and Paulson on Svarstad 2005:14)<sup>28</sup>. Adding to this, Scott Whiteford and Alfonzo Cortez-Lara state that their political ecological approach<sup>29</sup> focuses particularly on the “ways in which environmental change is a translocal process and a part of the global economy” (2005:233). The hermeneutic circle for my work begins from the political situation which drives ecological action (in this case development of WatSan programs) and moving to the resistance and/or adaptation seen in local groups vis-à-vis that system. This approach also allows for the consideration of the human right to WatSan within an ecological framework, wherein the impacts of development on the natural environment are pitted against humans’ need for the goods of WatSan.

Barbara Rose Johnston’s “The Political Ecology of Water: An Introduction” (2003), and “Water, Cultural Diversity, and global Environmental Change” serve as touchstones related to political ecology. In her 2003 work, she specifically relates development to decreases in the world’s fresh water supply, and links fresh water sources’ health to the need for hazardous waste removal and sanitation/treatment facilities, all using political ecology as a framework (2012:71-76). She also looks at the multilateral and transnational forces that link development and water—and uses a political ecological approach to outline injustices within the system (2003). Erik Swyngedouw and Nikolas Heynen (2003) and Bill Derman and Anne Ferguson (2003) also allude to this transnationality, arguing that sociospatial processes in WatSan are at once local and global (NGOs, the state, and the community). Thus, the transnationality of WatSan lands the issue distinctly within the realm of political ecology. To link this to human rights, Westra has argued the need to “link ecological degradation and industrial toxic and hazardous byproducts to water issues in support of the basic human rights to life and health” (2012:14). Derman and Ferguson argue that rights are a distinctly political piece in political

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<sup>28</sup> This hermeneutic circle is meant to encourage learning, constant re-drawing of WatSan frames, and exploratory linkages between these levels.

<sup>29</sup> Here used in conjunction with critical medical anthropology.

ecological frameworks. (2003:277). Westra's approach may be an interesting point of focus for Bolivia's rural areas, where toxic wastes and garbage wastes are more and more commonly polluting the rivers, and in turn having social and ecological impact on water sources. Using a political ecological framework for sanitation fills a gap in the literature related to these complex relationships (Alley 2002). Political ecological approaches also allow for the idea that "foregrounding people, their relations with each other and with the environment is key to place-making" (Taylor 2012:35). I argue, for instance, that in Bolivia the impact of foreign aid has changed local perceptions of acceptable water use and water treatment. I further argue that the impact of the complex politics between the Bolivian government, aid agencies, and rural areas, has changed the landscape of this space to one which uses western ideas of sewage removal and wastewater treatment — one which may not be appropriate or sustainable for the area. And finally, I argue that new waves of conservation practices (such as fights against deforestation in order to protect water resources) are as politically-charged as they are environmentally necessary.

### **Why a Political Ecology of Water and Sanitation?**

Swyngedouw et al. (2002) and Derman and Ferguson (2003) each compiled lists of how political ecology is meant to frame water issues. They draw on several authors who work in the field and each summarize common approaches to (and drivers of) PE research on water issues. The main components raised by both authors (simplified here in one sentence summaries), which serve to bound the approach of political ecology in specific cases include:

1. Social changes and environmental changes are related and play off of one another.
2. What we think of as natural environments aren't really natural—people did that.
3. History matters to PE, and it matters that this history is contextually and culturally grounded.
4. The environment can be used for profit—and some people use the environment to profit.
5. Different levels of analysis (from the local to the global) are important in PE approaches.
6. PE work usually is concerned with justice and unexpected social outcomes
7. PE often has an applied or policy-based product.

8. PE is concerned with power and how power relates to social-environmental relationships.

Here, to translate these broad categories of concern with my specific PE for water *and sanitation* approach, I present the following foci (here presented as brief categorizations which will be expanded in further chapters):

1. *The addition of WatSan technologies and infrastructure is an environmental change.* It takes a resource—water—and, through human interaction with that resource in a new way, as both fresh water and wastewater, creates certain social and ecological effects. This is not a one-way process; it is a cyclic relationship, wherein environmental and social changes mutually reinforce one another.
2. *The environment from which fresh water is gathered, and the water source or land to which the wastewater effluent is expelled, are neither “natural” nor “pristine.”* However, perceptions related to the “naturalness” or “purity” of these resources or locations plays into how people interact with the new systems infrastructure.
3. *History matters in WatSan* — who owns the water resources, how those resources have historically been used, and what has happened in immediate and surrounding natural environments all relate to perceptions and management of these resources. Similarly, historical practices related to sewage removal and waste treatment will come into play.
4. *Water has monetary value.* Ensuring that water is treated effectively, both at the drinking and wastewater treatment stages, is costly. How people use that resource, and how they manage costly infrastructure, will be an interplay between their perceptions of stewardship for the environment, individual need, and profit-garnering mechanisms.
5. *There are several “levels” in water and sanitation development which need to be analyzed—from the global to the local.* The forces that drive WatSan development, including transnational ideas of development, transnational players (NGOs), government organizations, national governments, communities, and individuals must all must be included in the conversation about the process of WatSan.
6. *Equitable access to water is necessary to sustain life, and access to clean water is necessary for health and well-being.* The entire process of WatSan relates to this — fresh water sources are necessary for drinking water and sewage and wastewater treatment ensures that water sources are not contaminated. Justice is inherent in this process, then. Who gets access to these necessities? Who is left out? And, once infrastructure is placed to provide this access, what are the unexpected and potentially marginalizing effects of the infrastructure?
7. *WatSan projects are of interest to several different groups,* and policies which direct the practices of these groups, such as engineers, academics, and development professionals, are nonstandardized. Applying the results of an anthropological study to policy recommendations is one of the key aspects of this work.
8. *Power, and the way power holders impact WatSan environments, is central to the study of water and sanitation development.* Who owns, directs, makes decisions regarding, and implements WatSan projects? What power (or lack thereof) does the community in which the project is placed wield? How does this all relate to management and upkeep?

Now, while these eight components do exemplify the ways in which a PE approach will be applied in my work, these foci are certainly not exhaustive. Just as is evidenced by the



several different ways in which individuals refer to the social relationship with water, (e.g. “waterscape” (Strang 2004)<sup>30</sup>, “waterworld” (Hastrup 2009), or “hydro-social cycle” (Swyngedouw 2004, 2009) (Whiteford et al. in press: n.d.), there are several different ways to stretch the theory of PE to the WatSan sphere. Using the theory, and ensuring that it is historically and socially grounded in Bolivia, is a specific focus here. I also, however, employ allied theories (critical development, human rights, water and culture) that mesh with the PE approach.

### **WatSan Infrastructure Studies and “Natural” Water Systems**

It is important to construct a theoretical frame for the study of infrastructure, in this case WatSan infrastructure. I speak of infrastructure here in regard to the physical components of building a WatSan project, and the technologies used to build them. This term resembles the Marxist concept of “infrastructure” which is often interchangeable with Marx’s “base”—or the forces of production and labor which support the “superstructure” of a society, or, broadly its culture/society (for more information see Marx 1936[1887]). Infrastructure’s relationship to production and labor within natural systems, and to the labors that produce them are useful to interrogate, and as much of society rests on human-built infrastructure these infrastructures are integral to, and both mediate and are constrained by the cultures that use them. Systems such as roads, water delivery, and power are often so taken for granted in the western context that they are forgotten (unless they break, of course).

Paul Edwards speaks about the construct of basic infrastructure as the “connective tissues and the circulatory systems of modernity” (Edwards 2002:2). Foucaudian theories of biopolitics (Gandy 2006, 2004) have been used to address the outcome of WatSan infrastructure in developing country contexts, especially in regard to the emergence of a

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<sup>30</sup> I use “waterscape” in this work, and add to that the term “wastescape.” (which I’ll attribute to Alley:2004, although I’m sure others may have used this term concurrently. This is chosen because of its inclusion of culture, and because of Strang’s clear focus on the lived experience of water alongside the ecological reaches of water’s influence. These are also the terms that sound the least ridiculous, in my opinion.

“bacteriological” city, and the infrastructures necessary to ensure urban health and wellbeing. Much of political ecological looks at infrastructure discuss “networked infrastructures” (such as electricity, water, wastewater) as both society-shaping and shaped by society (Monstadt 2009:1928). These networks, furthermore, both preserve the sustainability of and yet potentially endanger surrounding environmental systems. The ways in which individuals interact with and are changed by infrastructure are relevant as well, as new infrastructure can change livelihoods and ways of life (Carse 2012). Ashley Carse actually discusses nature as infrastructure, and interrogates the separation between “natural” and “built” systems, arguing, “nature becomes infrastructure,” inasmuch as it is transformed by human political practices (2012:540). This is all broadly subsumed under science and technology studies (STS), which looks at infrastructure’s place within society, the workers that address and manage it, and its invisible yet pervasive political position (e.g., as discussed in Bowker 2010, Carse 2012). When I look at infrastructure I address it through a wider lens that prizes political ecological aims.

Complex WatSan systems, especially centralized ones, are new to many areas in rural Bolivia, and for the areas where they are placed, they invariably produce social change and adjustment. I work to address two aspects of WatSan infrastructure, first, its inherent power, and second, its potential to disempower certain groups. I also address WatSan infrastructure’s relationship to the environment that encompasses it and the ways in which environmental resources are used, changed, and impacted by that infrastructure. I argue that not only are social and environmental lives mutually constituted, but that social, environmental, and infrastructural lives are mutually constituted in WatSan. The changeover from “natural” to built water and wastewater flows in new WatSan systems causes new relationships within society, and these relationships are bounded by new ways of using and tethering the environmental resource of water.

## **Critiquing Development**

Development theory, and especially post-development theory, is complementary to and provides an avenue through which to critique and ground the practice of human rights, in this case the human right to water and sanitation. I use development theory to drive discussion related to WatSan on two levels: first to discuss the motivations of and impact of development and NGOs on local lifeways during policy, construction, and implementation of WatSan systems, and second to discuss the likelihood for sustainability of WatSan projects long-term. Simply put, does the project work, is it worth it, and if so, for whom does it work? Additionally, within Bolivia, development strikes cultural cords. Bolivia's background of resistance and state-level dislike of westernized development models (Assies 2003, Hailu, et al. 2012, Powers 2006, Ribando 2007, Schultz and Draper 2008, also discussed further in this chapter) is certainly relevant.

**Development Critiques.** Critiques of development, including those of Emilio Escobar (2010, 2007, 2005, 1995), call development a new exercise in hegemony and power on behalf of "donor" nations. Escobar's position rests on the work of Michel Foucault and Edward Said. Foucault noted that western development was the power-laden work of colonizers in the same vein as original colonialism (Peet and Harwick 2004, Ramirez 2011), whereas Said focused on "orientalism" and argued that western views of the East were markedly biased representations stemming from western imperialist viewpoints (1978). Escobar, with this background, found development to be a language of power, that "development" came from the "rise to hegemony of the United States," and that it was deeply tied to a multitude of failures (Escobar 2008, 1995, Peet and Harwick 2004:222).

However, drawing on the work of Jonathan Crush (1995), David Gow argues that while this postmodernist, anti-development theory may hold water, it does not mean that individuals have stopped wanting development (2008:4). Richard Peet and Elaine Harwick (2005) propose

critical modernism as an approach to navigating this discourse. Critical modernism is meant to be an alternative to modernism *and* post-modernism, as well as postmodern critiques. Instead, “critical modernism should focus on the question of development—understood as the social use of economic progress—as a central theme of our age” (2010:275). Critical modernism is critical, but critical in order to promote change, rather than critical in order to promote inaction as postmodernism arguably is. Thus it strikes a difficult middle ground of censure and practice. Gardner and Lewis state that, “if anthropologists have any collective responsibility it is endlessly to question and problematize their positions, to be uncomfortable, and with their questions to make others uncomfortable” (2005:352). However, I do not think that this critical interrogation should limit anthropologists’ ability to inform future work or to provide policy recommendations for working development. This critical eye is certainly central to the place of anthropologists in the future of development, but I also argue that (in the space between postmodern critique and critical modernism) anthropologists can also work with NGOs and other organizations on policy and programming specific to development and human rights initiatives.

**Development in Bolivia.** U.S.-based development and Bolivia have a long history (discussed further in this chapter) and Bolivia has been subject to waves of development paradigms throughout the 20<sup>th</sup> century until the present. Understanding past economic theories which came to bear in development policies, including Keynesian democracy<sup>31</sup> and neoliberal democracy<sup>32</sup>, is important to track Bolivia’s development trajectory (Kohl and Farthing 2006). Bolivia rode the wave of several development theories in its growth as a nation. Modernization techniques<sup>33</sup> became “plainly apparent” as failures in Latin America came to a head in the

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<sup>31</sup> Keynesian Democracy refers to “interventionist states committed to achieving full employment and high incomes for everyone, using state authority to stabilize accumulation and to democratize economic benefits” (Peet and Hartwick:283).

<sup>32</sup> Market-driven, profit-centered approach to democratic development.

<sup>33</sup> “Modernization” is spoken about in many contexts and has many assumed meanings. However, modernization is usually associated with capitalism, the betterment of society through economic growth, competitive markets, and profit-making mechanisms such as industrialization (Peet and Hartwick: 276-277). These things are also associated with *neoliberalism*.

1960s (Leys 2005:112, Peet and Harwick 2009:223). Also, neoliberal additions to the development paradigm in the 1970s gave rise to market-oriented interventions and strong non-state actors such as the IMF, World Bank, and USAID, and the UN (Grunberg and Khan 2000), the fruits of which are still being protested in Bolivia (Kohl and Farthing and Kohl 2005). These programs have been offering WatSan systems as elements of development since at least 1962 (Edmundson 1967, USAID Website). I discuss other development paradigms in Bolivia's history in chapter 3—but here I will note that all of these paradigms can be better understood and researched with an anthropological perspective on development.

**WatSan and Development.** Researchers involved specifically with the place of water in development paradigms have critiqued payment issues (Pruss-Ustun 2008, Johnston 2009), neoliberalism (Ahlers 2009, Assies 2003, Buds 2004, Castro 2008, Kohl 2002), and have highlighted problems with water scarcity (Postel 2000, Whiteford and Whiteford 2005, Spencer 2000). Critical development theory has also turned water researchers' focus to gender differences (Bennett et al. 2008, Blumtritt 2012, Laurie 2011, Manase 2003, Regmi and Fawcett 1999, Wills 2012, Wutich 2009b), and ethnic tensions/issues of marginalization (especially for the poor) related to water resources (Allen et al. 2006a, 2006b, Berg and Mugisha 2010, Crow and Sultana 2002, Komvies 1999, Mheta 2005, Wagner 2010). Each of these pieces provides part of a mosaic of issues which can arise from and within development initiatives related to water.

Studies completed in Latin America related to water have found broad-based household and community-level impacts from the implementation of water systems by development organizations (Bennett 2011, Libbet 1991, Davlia-Poblente and Nieves Rico 2005, Petit-Riley et al. 2010, Fragano 2011). Reported issues in water system development include gender inequity in water management (Zwarteveen and Benett 2005), inefficacy in reaching the poor/marginalized (Stroud 2011), issues with long-term upkeep (Komvies 1999), problems with

cost/payment for water (Wutich 2009b), and inequality in related water control and access (Delgado 2005). The impact of neoliberalism and neoliberal discourses (Ahlers 2009, 2005, Assies 2003, Castro 2008) as well as problems related to water use and environmental stability/sustainability (Budds 2009, 2004, Hires 2011) come to light in studies which take a critical approach to water and development, and are particularly salient in Bolivia where problems surrounding privatization of water and water shortages have emerged (Cardenas 2012, Kohl and Farthing 2006, Nash 2005, Spronk 2007, Whiteford and Cortez-Lara 2005).

Sanitation, however, is starkly absent from many of the discussions related to water and development in anthropology, while others treat it only cursorily. Wendel et al. (an interdisciplinary team including anthropologist Rebecca Zarger), highlight the relationship between poverty and lack of access to the service of sanitation and wastewater treatment in Santa Cruz in their paper focused on access to greenspace (2012). They tie lack of sanitation and the reliance on “in situ sanitation systems, septic tanks, pit latrines, and soakways” to the outer, poorer districts when it comes to regional development (2012: 274). Alley notes several tensions related to personal expectations for sewage and wastewater treatment facilities – for instance, many think that governments should provide this at low cost for citizens but instead, many must rely on development agencies for access to these services (Alley 2002:166). The inclusion of sanitation into water-and-development paradigms should open up a more holistic view of water development projects by outlining possible areas of marginalization and by interrogating the idea of development within national settings. Each of these studies highlight the difficulty of reconciling the global human rights discourse of water and sanitation as a human right with on-the-ground conditions and impact from development, a difficulty which I will also explore in this work.

## Human Rights

WatSan has been named a human right<sup>34</sup>, and it is from this vantage that I situate my research. I argue that WatSan should be a human right and support rights-based approaches to WatSan development. Still, it is important to interrogate the idea of rights, outline its flaws and gaps, and examine its structures from a critical vantage within anthropology. I focus here on anthropological critiques of human rights and transnational construction of rights, theories that critique or spur anthropological action based within human rights theories<sup>35</sup>, present studies which elicit the relationship between human rights and WatSan, and also address the human rights climate in Bolivia.

**Anthropology and Transnational Human Rights.** Ellen Messer has stated that anthropologists are now “expanding the scope, filling in the content, and participating in organizations” which enforce human rights (2003:240). A movement away from relativism (as exemplified by Herskovits’ AAA statement in 1947) when it comes to human rights seems to be a disciplinary movement (this is noted by Messer in 1993 and holds true in the work of Barth 2000, Engle 2001, Goodale 2009, and Wilson 2008). One thing that anthropologists who engage human rights have in common is an ability to (and a distinct responsibility to) critique the structures in place related to human rights (MacKinnon 1994, Wilson 2008:78, Speed 2008). Bruce Knauff is arguably at the forefront of human rights and social justice theory (Lutz and Nonini 1999, Moore 1999) with his concept of “critical humanism” –this includes documenting as well as taking action to “expose, analyze, and critique human inequality and domination” (Knauff 1996:50). I follow Knauff’s view of critical humanism. Specifically, I turn it on rights dialogues

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<sup>34</sup> A code of international human rights was outlined in the 1948 Universal Declaration of Human Rights. WatSan as a human right was added in 2010 (see American Society of International Law 2010). The Millennium Development Goals (MDGs), are not specifically based in human rights but they are commonly associated with human rights—the MDGs outline WatSan needs (Cali et al. 2010, Fukuda-Parr 2010, Horn et al. 2011, Hutton et al. 2007).

<sup>35</sup> Human rights is not an anthropological theory, but rather a transnational theory which is interrogated by anthropological concepts and theoretical critiques.

and the position of development, noting that actions on the one hand meant to lessen inequality and domination related to lack of access to these services can also serve to impose a different kind of domination through western development and individualism (Assies 2003). Put another way, human rights as a discourse can spur action that is neither value-free nor risk-free (Reyes 2011:19). Discussions surrounding transnationalism<sup>36</sup> in human rights are also useful (Bustamante et al. 2011 Goodale 2009, 2003, Merry 2001). I use the idea of transnationality to speak about the wide range of global-national-local relationships entwined in the human rights system, and the effects of this relationship on local peoples.

**WatSan and Human Rights.** Human rights and WatSan have had a long history—several different decisions and conventions<sup>37</sup> have related to the right to water and (later) to the right to sanitation. Many of these summits and statements have occurred during the current UN Water for Life decade (2005-2015), and some were tied to the UN’s Millennium Development Goals (MDGs) (Arnad 2007). Finally, “on 28 July 2010, through resolution 64/92, the UN general Assembly explicitly recognized the human right to water and sanitation *and* acknowledged that clean drinking water and sanitation are essential to the realization of all human rights”<sup>38</sup> (United Nations 2012, emphasis added)<sup>39</sup>. So, here we have a double-edged

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<sup>36</sup> Transnationality here refers to the system in which non-state actors such as NGOs can act outside of the realm of nationalism. The term is linked to globalization and neoliberalism (Goodale 2009). Kearney (1995) actually couches the idea by stating that globalization could equal a working relationship within and transcendent of state actors (Kearney 1995). Anthropologists differ on whether true transnationality exists today, or if most systems are still lorded over by the state system. In terms of WatSan in Bolivia, I argue that the provision of resources is something like Kearney’s position, that actors work within and transcendent of the state—however, I argue that these actors actually act more transcendent of than within the state system. Some also connect transnationalism to theories of political economy when related to water (Anathakrishnan 2008, Bond 2010).

<sup>37</sup> E.g. Mar del Plata (1997), Convention on the Elimination of All Forms of Discrimination against women (CEDAW) (1979), Convention on the Rights of the child (1989), Conference on Water and Sustainable Development (1992), UN Conference on Environment and Development (1992), UN International Conference on Population and Development (1994), Summit on Sustainable Development (2002), and the Convention on the Rights of Persons with Disabilities (2006) (Arnad 2007, UN2012).

<sup>38</sup> As a follow-up in 2011 the UN extended the mandate of 2010 by appointing a special rapporteur and specifically stating that there should be “emphasis to practical solution with regard to its implementation” – this solution specifically referenced affordability as a criterion (United Nations 2012).

<sup>39</sup> Even before this, countries were working from right-to-water paradigms (Abdel-Gawad 2007).



statement that not only is WatSan a right, but that WatSan is also deeply tied to many other rights as well.

WatSan rights are directly related to inequality and domination. They are related to the right to health, adequate housing, education, life, work, and the prohibition of degrading or inhuman treatment (Allen et al. 2006a, 2006b, Bosch 2011, de Albuquerque 2009,). WatSan as a human right also extends to women's equality and women's rights, as women are made vulnerable when they must relieve themselves in the open and when they must go gather drinking water (Coles and Wallace 2005, de Albuquerque 2009) Further, "minority groups, migrants, indigenous peoples...suffer discrimination which may affect their access to sanitation" (de Albuquerque 2009: 17). However, while the lack of WatSan may cause these issues of inequality and domination, it is possible that its provision also comes with values and practices that may marginalize and dominate. A critical approach elicits on-the-ground issues that rise from rights-based discourses in action (e.g. the provision of WatSan in Bolivia) in order to inform the aims for WatSan's rights status.

**Bolivia-Specific Rights Focus.** The Bolivian Government has adopted a human rights framework and has infused itself into the transnational discussion of human rights (Assies 2003, Manjarrez 2010, McFarland et al. 2004). Additionally, "when translational NGOs deliver food...and potable water to hamlets in rural Bolivia...they do so now as part of a broader human rights agenda," (Goodale 2009b). Thus, Bolivia's government both uses and implicitly accepts (through NGOs) the human rights framework. Furthermore, Bolivian citizens have been impacted by the idea of human rights and are now speaking in universalist terms (Goodale 2007:145). However, while human rights discourses may have permeated Bolivia at all of these levels, the espousal of human rights such as WatSan and the implementation and upkeep of these rights are two very different things. Furthermore, the extent to which individual NGOs follow an explicitly rights-based approach varies.

**Note on Indigenous Rights.** For reference, Bolivia has also adopted indigenous rights frameworks. There is an understanding that rights discourses are now writ large throughout the nation of Bolivia, and that new rights consciousness is rising out of former ethnic tension into a unilateral indigenous voice (Pazos 2007, Postero 2007). This is also referred to as collective belonging (Goodale 2009a). While this indigenous rights discourse certainly is a pressure on Bolivia as a whole, my research thus far elicited little connection between community members and this indigenous position. Individuals as a whole did not identify as indigenous, nor did they actively participate in bargaining for rights based on indigenous identity, although most were technically of Aymara or Quechua backgrounds<sup>40</sup>. Many actually reacted with hostility to the idea that they were indigenous, pointing to Mosaic or Tipni populations as examples of indigenous groups. Aguilar and Spedding (2005), and Canessa (2012b) point to similar hesitancy to self-identify as indigenous from respondents in the Yungas area. In addition, individuals in Alto Beni are considered “colonistas” or “interculturales,” which means they do not have ancestral tenure of the land on which they live and have occupied that territory for less than a century –and thus fit a different definition of indigeneity than those with deep ties to their land (Conzelman 2008, 2007). Furthermore, the WatSan project, specifically, was not implemented due to indigenous rights. Rather, it was born from need and agreements related to the U.S. focus on eliminating coca growing (and on Bolivian government support with this endeavour) and from wider human rights frameworks (Goodale 2009b). Thus, while indigenous politics set the stage for work within Bolivia and are an important area of reference for understanding politics of ethnicity, place, and class in the country (see Chapter 4 for more specifics), the use of theory related to indigenous rights is inappropriate for the topic of WatSan in Bolivia.

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<sup>40</sup> Some Afro Bolivians also lived in the area where I worked, but as wives or husbands of individuals from Aymara or Quechua backgrounds.

## **Water and Culture**

Literature on water and culture asks two central questions: 1) how is water culturally situated? and 2) what are the meanings of water beyond its place in use? In truth, “water has always had cultural significance” (Klaver 2012:10)—but that does not mean that this significance is fully understood nor that it is static. Here, I highlight three main categories of inquiry that help to set WatSan in a cultural context: ubiquity, reflectiveness, and use. I then give particular reference to the place of sewage collection and sanitation in cultural settings.

**Ubiquity.** Ben Orlove and Steven Caton’s Annual Review article, “Water Sustainability: Anthropological Approaches and Prospects,” provides several theoretical tenets of use related to water and culture (2010). Not only do the authors clearly outline that water is a resource as well as a connecting force within culture, they also use Mauss’ idea of “total social fact” to discuss water – that is, the explanation of water as a “social phenomena that cut[s] across virtually all domains of society” (2010:402). This wide-reaching cultural meaning for water and its appearance in so many aspects of society is also noted by Linda Whiteford and Scott Whiteford (2005) and Veronica Strang (2004b). Kirsten Hastrup’s (2009) term “waterworld” is used heavily in the Orlove and Caton article (2010), wherein waterworld<sup>41</sup> is meant to embody this same “connectivity” of water within a social space. While I do not use this term (I choose “waterscape”), it shows that the ubiquity of water is a clear theoretical viewpoint for water and culture research. Understanding, at the level of theory, that water is related to the whole of a society, and is not just one small part of a larger culture, is important to drive a thoughtful and wide-reaching anthropological study.

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<sup>41</sup> I do not use the term for two reasons: first it fails to explicitly include sanitation while it is trying to include everything, and second because it masks what you are actually discussing—that is, the focus that your discussion as a part of a system is taking. WatSan being quite enough of a term to parse out, I don’t include this catch-all. I instead refer to the particular elements that I am speaking about, or, for waste, look at wastescapes (detailed in section 2). Certainly, I want to show interconnectivity and intersectionality between these elements, but this cannot be accomplished by obscuring the different parts of my study into one catch-all.

**Reflectiveness.** In its ubiquity, water is also reflective of a wide variety of social issues. Strang states that “water is always a metaphor of social, economic, and political relationships—a barometer of the extent to which identity, power, and resources are shared” (Strang 2004b:21). This aspect of her study relates to cultural history and cultural lifeways (Castillo 2012). Lisa Hiwasaki states that water and cultural diversity “embodies, in addition to water cultures, issues such as governance, power and rights” (2012:519). Before the fall of the colonial empire in Bolivia, water sources and systems were owned by the Spanish elite (Heath 1973). Now, water systems have been part of neoliberal movements and anti-neoliberal movements, privatized or made public. Furthermore, they have been implemented through a complex and transnational movement such as NGOs/ GOs or through government organizations’ funding. If water and access to it is a barometer of power, when aid agencies co-opt and pipe water sources to certain communities, these communities gain a type of power that rests on both a natural resource and an external infrastructural design, thus both impacting culture and their own ways of life. These infrastructural development projects can change culture, change management, change ways of knowing—and I argue that they can change inter-group and national politics related to place. This raises, for me, several questions. How do other communities (perhaps with more indigenous claims to the land) handle their need for lumber and livelihoods when WatSan practices co-opt water sources? Are land and water rights in the NGO’s hands? If water is reflective of cultural power, how is this being addressed? And what does this mean for the global system writ large as relates to water and power<sup>42</sup>?

**Use.** Water use is intimately cultural. The ways in which individuals conceive of, manipulate, and use water vary by cultural context. When water is scarce, or when water is dangerous (e.g., when impotable water needs to be treated), the practices of individuals—especially when related to sharing and treatment—vary by setting. Water use can be gendered

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<sup>42</sup> Calenbach (2009) focuses on the global nature of the water crisis.

and classed, and correct uses of water can vary even by climate and topography (Bosch 2011, Cleaver and Hamada 2010, Ferro 2011, Gleick 2003, Orlove and Caton 2010, Rocheleau et al. 2006, Wutich 2009b). Veronica Strang states that “engagement with the environment provides synaesthetic experiences that are integral to the generation of meaning; and instrumental in the development of cultural values and practices” (2004b:5). This engagement with the environment is a second place of inquiry within the realm of use—how do individuals develop cultural values related to conservation and use of water sources from this interaction? How is the meaning of water imbued in individual- and community-level water management? And, how is the meaning of water as a resource changed by the movement from indigenous lands to other lands (especially when individuals moved to these areas for increased profit?). Rutgerd Boelens argues that the “cultural-metaphysical” domain of water provisions “focuses on how the rules, rights, and duties attached to water are closely linked to cultural systems of meanings, symbols and values” (2012:70). I ask: does the influence of NGOs and/or western values change these systems of meaning? And if so, how does this impact use?

**Sanitation and Sewage Collection in Cultural Context.** Potable and fresh water is more of a focus in water-and-culture literature than sanitation and sewage collection. Specific research on the cultural meanings of waste and waste treatment are few, however I want to outline some conceptual constructs gained from current research here. Alley discusses ideas of sacredness and sacred purity and how these influence action related to wastewater (2002). While I expected that the treatment of wastewater in Bolivia would have far less of a relation to sacredness than does Alley’s work in India, the idea of *Pachamama*, or mother earth, and related concepts of environmental conservation and respect in Bolivia did mildly come to bear with issues related to wastewater treatment and pollution prevention. May Yacoob and Linda Whiteford suggest that community-level behavior may affect the effectiveness of sanitation projects (1994), an argument which drives my look at behavioral norms for community sanitation

practices. Carl Kendall (2005) argues that a multitude of cultural and environmental factors that can correspond with use (or misuse) of sanitation technologies (in this case latrines). I specifically draw from his discussion of individual dangers/pressures during outdoor defecation, and find his description of the cultural use of hillsides as areas for defecation useful as this practice is common in Bolivia (2005:102)<sup>43</sup>.

My cultural focus related to sanitation is also infused with the work of non-anthropologists. These include Wendy Wakeman's arguments on gender in sanitation environments, wherein she argues that women are more likely to give value to sanitation services (1995); Adriana Allen and colleagues' work (Allen et al. 2006a, 2006b), which focus on governance and political issues for sanitation in peri-urban poor areas (including Bolivia); Jennifer McConville and James Mihelcic (2007) who begin to look at socio-cultural factors and community participation in sanitation settings; and the work of Ryan Schweitzer and James Mihelcic (2012) who reference the cultural components involved in rural WatSan systems management. While these works by no means give ethnographic accounts, they do start the discussion related to culture and WatSan systems, and give reference to the need for more cultural knowledge. My work will add to the literature in the way that I frame traditional water-and-culture approaches in terms of the relationship between *WatSan* and culture, and in the use of these theories to discuss the social impact of WatSan in my particular ethnographic context of rural Bolivia.

## **Part 2: Place**

While these theories, combined and led by a framework of Political Ecology, are certainly relevant for the process of WatSan—setting these theories historically and geographically is exceedingly important. As Swyngedouw argues, water environments are produced actively and historically (2009:56). By infusing understanding of waterscapes within

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<sup>43</sup> Shannon Beder (1990) also provides a discussion regarding sewage and cultural impact for Australia.

these active/historical underpinnings, we are better able to situate an understanding of WatSan in individual locations. Understanding “social, political, and historical situatedness of water access, rights, and control” is paramount to applying PE (Whiteford et al. in press: n.d.). .

### **Colonialism**

The Spaniards instituted a colonial administration in Bolivia starting in the mid-1500s and their rule lasted until the revolutions of the early 1800s (see Canessa 2012a, 2012b, Postero 2007). Natural resources such as silver (from Potosi) and rubber (from the eastern lowlands) drew explorers and profiteers. Indian subaltern classes were dominated by the colonists through force and through control based on existing hierarchies (Albó 1989, Albro 2010, Barrientos 2011, Burman 2010, Langer 1989, Postero 2007). During this time, Spanish and their Creole descendants, while the minority, had power over the “Indio” majority (Spronk 2007:13). Still, the situation of the “*Indios*” was not static. Franz Fanon, in speaking about the effects of colonialism on a theoretical level, states that “the colonial situation brings national culture virtually to a halt,” but that when individuals rise against the colonial powers to reinstate “cultural dynamism” these are the signs that there is a force for liberation (Fanon 1963:171). These influences to which Fanon gives weight were notable in the colonized Bolivian state. Indigenous rebellion against the Spanish colonists was common, with the Guaraní rebellion near Santa Cruz (Postero 2007) and rebellions by Yungueña (Aguilar and Spedding 2005) being just two examples. The distinction of Bolivians as activists, organizers, and strong protesters is a distinguishing characteristic of the Bolivian public dating back to this time (Postero 2007, Olivera 2004). Arguably, the long-term subjugation of indigenous individuals by European powers taints relationships between present-day organizations (such as USAID) and the United States. The United States is now seen as a type of colonizing power and as responsible for negative

impacts from neoliberal logics.<sup>44</sup> Anthropologists have found that “many indigenous communities [in Bolivia] see their current struggles explicitly in terms of their own memories of conflict and injustices of the past” (Canessa 2012a: 202, supported by Fabricant 2012). This perhaps holds true in later expressions of discontent—when U.S. companies privatized water in Cochabamba, this action was met with similar rebellion (Assies 2003, Olivera 2004, Postero 2007). However, I argue that the impact of colonialism and neoliberalism has also affected how protests occur, by whom, and on what grounds.

### **Post-Colonial Relationships with the U.S. (Focus on Development)**

Soon after Bolivia’s independence, and early in the U.S.’s tenure as a nation, the U.S. began an official relationship with Bolivia through the dispatch of a diplomat in 1848 (Lehman 1999:29)<sup>45</sup>. This marked the beginning of a complex, imbalanced relationship that has continued to the present day. By the early 1900s, the U.S. had become a world power. U.S. agencies and citizens soon sent missionaries to, and extracted resources from, the Bolivian state. Bolivia was still being ruled by a series of elites of Spanish descent, so tensions between indigenous groups and the government, as well as indigenous groups and outside forces, were clouded by the imbalance in power relationships with the ruling minority of Spanish descent. These imbalances manifested in both class and cultural relationships. Pablo Ramirez states that “the borders between culture and economy [in Bolivia] are often undifferentiated and blurred, such that, for instance, class domination is naturalized as a relationship between unequal ethnocultural groups” (Ramirez 2011:34).

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<sup>44</sup> I do not wish to characterize neoliberalism as one phenomenon, but in order to discuss the effects of this set of practices I use the word “neoliberalism” as a representation of these practices between the U.S. and Bolivia, and related to NGOs as a whole. I use it as a “productive rubric” (Allison and Piot (2011)). For more information on and critique of neoliberalism as a rubric see Kingfisher and Maskovsky (2008).

<sup>45</sup> For perspective’s sake, I want to remind the reader that the United States gained independence from colonial government in 1776. Bolivia began the process of independence in 1809, and the struggle continued into the mid-1930s. Both rebellions, notably, were led by past colonizers (of English and Spanish descent, respectfully).



According to the USAID website, assistance to Bolivia by USAID began in 1942. During the cold war the United States expected cooperation from Bolivia on the non-proliferation of communist practices. Development and aid was held as a carrot for good (read: anti-communist) behavior. Moreover, tensions between class, indigeneity, and political power now contravened alongside this U.S. influence.

The effect of the U.S. development projects was not always positive and their aid favored certain Bolivian political parties over others. USAID began to notice development missteps from their practices and reported failed techniques in cultural appropriateness early on—and they were also seen as having “little respect for their [Bolivian] government partners” (Lehman 1999:128). Still, development pushed on and increased during this time, creating rifts in the existing state politics between the Bolivian National Revolutionary Movement (MNR, a non-communist group which was supported by the U.S.) and other political groups which were more left-leaning (Crabtree and Whitehead 2008, Heilman 1982, Lehman 1999, Weston 1968). At the same time, Indigenous identity was being conflated into the more catch-all term *campesinos* (peasants), as ethnic markers were seen as racist by the MNR (Postero 2007). Here, difference was disguised, without respect for the differences in access to power and resources within the indigenous population as a whole<sup>46</sup>, and this movement was implicitly supported by the U.S. In 1952 the MNR led a revolution in Bolivia and made profound changes to the government, all with a “populist-modernist” orientation (Kohl and Farthing 2006:46). The United States’ position as an aid-granting nation shaped politics and supported the Spanish ruling class over the more populist, left-leaning peasantry.

The U.S. aid relationship with Bolivia continued in the 1960s and 1970s. This time period was concurrent with the Green Revolution and philanthropy movements in development (including water and sanitation infrastructure programs), and thus had a somewhat different

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<sup>46</sup> This pressure will later feed into the idea of multi-ethnic societies and the rejection of “mestizo” markers in the present Bolivian state (Cassa 2012:205).

conceptual bent than later neoliberal movements (i.e. less based on economic development and more on philanthropy and alliance-building (Goodale 2007, Escobar 1995). President Jimmy Carter championed a human rights emphasis developed in the mid-1970s, due to the untenable political situation<sup>47</sup> in Bolivia as well as the popularization of the transnational theory of human rights (Lehman 1999, Crabtree and Whitehead 2008). The U.S. administration pushed these dialogues within the Bolivian system with mixed results (Crabtree and Whitehead 2008). Interrupting this initiative, military rule and a following series of coups in Bolivia took place from 1964-1982, initiating a period of inconsistency in citizens' rights and lashing back against the Carter-era aims. USAID pulled funding from Bolivia from 1980-1982 due to the precarious political situation, but quickly re-kindled the development relationship after the brief cut. Pushing this relationship was the U.S. endeavor to limit the production of coca<sup>48</sup> and cocaine. Soon the U.S. was back to full speed, sending aid and development promises, including water infrastructure, which were offered in return for coca non-proliferation<sup>49</sup> (see Conzelman 2006, 2007, 2008; also covered in section 2 of my discussion).

As of 2008, however, Bolivia's leftist anti-neoliberal government started to dismantle the U.S. relationship with the country. As put in the U.S. State Department's background note, as per their website (accessed 12.20.2013) reads:

*"Relations with the United States deteriorated as the Bolivian Government began to dismantle vital elements of the relationship. In 2008, the government expelled the U.S.*

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<sup>47</sup> Communist and populist movements were still clashing at this time, placing U.S. attention on these issues (Lehman 1999).

<sup>48</sup> Coca is a plant grown widely throughout Bolivia. It has medicinal properties and cultural meaning for Bolivians, and is often brewed in tea or chewed with stevia. However, when processed, it is the base ingredient for cocaine, and thus the production of coca in Bolivia has been a subject of U.S. and international scrutiny. The United States wanted to eradicate or at least gradually decrease the production of the plant. For more information on the cultural uses of coca (see Allen 2002, Conzelman 2006, 2007).

<sup>49</sup> The water and sanitation program implemented by USAID in Sapecho (my field site) was put into place under the vestiges of this relationship in the late 2000s.

*Ambassador and the U.S. Drug Enforcement Administration from the country. It expelled the U.S. Agency for International Development in 2013.” [USAID Website]*

The U.S. attributes the expelling of these agencies, at least in part, to Evo Morales’ anti-neoliberal stance. The following paragraphs interrogate the period of U.S. and European-driven neoliberalism in Bolivia, especially related to issues of ethnicity and class. This neoliberal era, and the development paradigms stemming from it, have been likened to a new form of colonialism (Burman 2012, Escobar 2008, Postero 2007, Goodale 2009a). My inclusion of the colonial and post-colonial background is meant to ensure that the position of Bolivia’s colonial and post-colonial past is not forgotten in discussions related to new neoliberal development, modernization, or urbanization, or in discussions of ethnicity and class relationships. U.S.-led development, even in sectors such as “basic needs” related to WatSan, has been linked to political, social, and ideological value judgments on behalf of the donor nation. Furthermore, they served to, during the post-colonial era, prop up the white-Mestizo elite and propagate the de-identification of specific indigenous group membership. Further discussion of USAID’s relationship to Bolivia (and how its position in the country relates to the overall climate of neoliberalism) is introduced here, but also expanded in chapter 3.

### **Neoliberalism and Bolivia**

As of 1982 neoliberal structural adjustment plans were put into place, led by the U.S., both as a reaction to the series of Bolivian revolutions and the rush toward capitalization. The New Economic Policy (NEP) was “nothing less than a new ideological and philosophical framework to redefine Bolivia’s future economic, social, and political choices” (Spronk 2007:10). The goals and aims of transnational corporations, western society, and other westernized frameworks have driven the neoliberal<sup>50</sup> movement. The policies in place in Bolivia were

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<sup>50</sup> Here I use the term neoliberalism in terms of neoliberal globalization as defined by Kohl and Farthing as “policies that subordinate the broader public interest by privileging the private sector while minimizing the role of government production—in over 100 of the world’s low and middle-income countries,” a

certainly related to the “Washington Consensus,” a set of guidelines dictated by the International Monetary Fund, World Bank, and U.S. Treasury Department, and Millennium Development Goals commonly associated with neoliberal outcomes in Latin America (Peet and Hartwick 2009, Perrault 2005, Goodale 2007).

**Internal Pressures.** While external pressures and policies did impact Bolivian movement against neoliberalism, a great deal of the specific changeover to neoliberal policies in the Bolivian state was internal (Perrault 2005). As noted by ethnographer Daniel M. Goldstein, “the Bolivian state has wholeheartedly pursued a neoliberal democratic model emphasizing free market reforms, privatization or capitalization of state-owned industries, and the withdrawal of the state from social service provision”(Goldstein 2004:180). Neoliberal philosophies are seen in many institutions and policies in Bolivia (Postero 2007:18). Challenges against neoliberal economics, however, including privatization of basic needs and services such as water and gas, have been common throughout the country (Goodale 2007, Postero 2007, Powers 2006, Crabtree and Whitehead 2008, Olivera 2004). Further, the negative impacts from neoliberalism, including stratification of wealth and resources, now throw the country’s urban/rural divide into sharp relief. They also have disproportionately negative impacts for certain ethnic and economic classes, especially those who were marginalized during the colonial and post-colonial periods. Specifically, “poverty and underdevelopment [in Bolivia is/has been] concentrated among indigenous populations and the highland areas (Coussens 2009: 1). However, the position of these groups in respect to neoliberalism is nuanced and not wholly negative—especially when it comes to external aid and development.

#### **Indigenous Marginalization and Class Difference Under Neoliberal Regimes.**

State-level impact from neoliberalism is regarded as overwhelmingly negative for poor and marginalized Bolivians, and has led to economic instability (Kohl 2006, 2002, Kohl and Farthing

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definition which he compiled from the World Bank (1990, 1993, 1997), Gill (2003), and Peet (2003) (2006:12).

2006, Postero 2007, Giulino 2010, Goodale 2009). International debt, capitalism, and privatization are seen as having particularly negative impacts for the state's poor –these policies have widened the income gap in Bolivia and have affected international relationships, especially with U.S.-based aid agencies (Ahlers 2009, 2005, Olivera 2004). The links between water and global neoliberal politics have been highlighted in the Bolivian context due to widespread drives at privatization and commercialization, including the privatization of water sources (Ahlers 2005, Assies 2003, Bennett et al. 2005, Castro 2006, Spronk 2007). Oscar Olivera, a famous anti-neoliberal activist and working-class leader, has stated that “neoliberalism and privatization of formerly public resources have not benefitted the overwhelming majority of Bolivians” (2004:7). Neoliberalism is also correlated to increased urbanization and a decrease in the power of labor movements (Schultz 2003, Spronk 2007:11-12). To counter this, however, I will state that while labor movements were disempowered by this regime, Moises Arce and Roberta Rice argue that neoliberalization actually activated other forms of socio-political resistance (2009). Neoliberalism has spurred a strong indigenous and working-class resistance movement *outside* of labor unions, and their position as petitioners of the international vs. the state sphere is becoming widely recognized on a global scale (Powers 2006). The following paragraph details the “water war” which elicits elements of this relationship.

### **The Water War: An Example of Social Movements and Imperfect Solutions**

A glaring example of a social movement spurred by anti-neoliberal sentiments is the “water war” in Cochabamba, one that I choose because of its notoriety in the international sphere as well as its correlation to my focus area of water and sanitation. In this case, local rights groups rose up against the *Aguas de Tunari* company (a subsidiary of the U.S.-based Bechtel corporation), which had signed an agreement with the Bolivian government to privatize their urban water supply. The population, facing financial hardship and deprivation of basic water access, united under a common cause to return this privatized resource to public

ownership. After massive demonstrations, the citizenry won the fight and the water system was de-privatized (for more information see Bustamante et al. 2004, Dangl 2007, Olivera 2004). As a testament to popular movements and to social movements' power against neoliberal/international aims, this example shows the ability of collective movements to fight for rights, including the right to water (Spronk 2007). Furthermore, this example fits the position of several authors that the privatization of WatSan is overwhelmingly negative for water sources (Kothari 2012, Mulreany et al. 2006, Spronk 2007).

In contrast, consider the actual WatSan conditions for sustainability and access. It is difficult to discount the fact that, today, water systems in Cochabamba are not fully-functioning. Certain sectors of the society do not have full access to water, the water is not always potable, and there are frequent shortages and cuts (Kohl and Farthing 2006: 187). Thus, while privatization did not provide the necessary answer to the WatSan problem for Bolivians in this region, anti-neoliberalism in itself is not a prescription for unproblematic WatSan provision. Arguments exist that privatisation is a positive force in WatSan programming, even in Bolivia, especially because the Bolivian state is unable to fully fund WatSan improvements (Lee and Floris 2003, Hailu et al. 2012). Hailu et al.'s study, particularly, follows the privatisation efforts in La Paz and El Alto, and found that in these cities "there was expansion of access to piped water for all quintiles [of income]...the low-income households benefited more than the high-income households" (2012:12). The privatization of these water systems, however, has since been terminated.

I am certainly not saying that the privatisation effort that spurred the water war was a positive one, but I am proposing that neither strictly neoliberal nor strictly anti-neoliberal policies have created a working and sustainable WatSan system. The Bolivian people cannot afford a privatized system, and the Bolivian government cannot provide working system infrastructure based on public funds. Central questions, then, include: where lies the correct route to WatSan

provision? What approach(es) should be used? And how should issues of class and ethnicity be included in the management of these systems?

### **A Nuanced Position for Indigenous and Working Class Groups Under Neoliberalism**

The relationship with neoliberalism, especially for working-class and indigenous populations, is nuanced—as Perrault states, “neoliberalism circumscribes the political and economic opportunities available to Bolivia’s indigenous and campesino peoples, *even as it makes such openings possible*” (Perrault 2003:280, emphasis added). On the one hand, the movement toward neoliberal multiculturalism (a turn away from several indigenous markers to a “multicultural” or “pluricultural” group) arguably reduced social injustices related to class and ethnicity and led to a collective voice for subaltern groups (Postero 2007). Anthropologists have noted that such neoliberal logics pushed individuals to solve problems with nonstate civil organizations such as NGOs. Relatedly, NGOs have become ever-present in Bolivia, providing resources to rural indigenous groups (Buena 2011, Postero 2007, Goodale 2006). On the other hand, this movement re-silenced individual indigenous groups, and disregarded inter-indigenous difference (Canessa 2012b:2004), reflecting similar pushes by the MNR government in the post-colonial time period. The truth, I think, is somewhere in-between—neoliberalism and NGOs both began a shift toward indigenous group representation through non-state means and effectively silenced sections of the less powerful indigenous groups.

Some indigenous groups have actually redirected the current of non-state organizing toward politically-centered gains. As Postero argues, Bolivian indigenous individuals involved in organizations and associations born from the movement *both* of and against neoliberalism have turned to political organizing and used “institutional channels” to influence elections and political processes (2007:17-18). Put another way, non-state neoliberal movements spurred a new kind of political organizing, but this organizing was directed back at the state and at the paradigm of

neoliberalism itself. This rebellion may have been occurring within the populous organically, but the NGO framework attendant to neoliberalism was a paradigm within which individuals fought for and gained power. But, as Canessa glibly points out—“not all groups have such privileged access [to power]” (2012b:204). Still, I will argue that shifts of power from the state to institutions, NGOs, and large international organizations such as the World Bank and the IMF did begin to make an impact on local activism, and that “community led development” was (at least partially) a by-product of this neoliberal movement. Figuring out the impact of these movements and their relationship to collective voice in Alto Beni is an important part of my research.

### **“Anti-Neoliberal?” Politics Under President Evo Morales**

The election of Evo Morales in 2006 turned global attention toward Bolivia. He is lauded as the first “indigenous” president of Bolivia (Albro 2006, Dangl 2010, Gustafson and Fabricant 2011, Powers 2006). He is also, strikingly, anti-neoliberal in his verbiage (Dunkerley 2007). The new constitution (2009), drawn under Morales’ regime, notes that the country leaves behind the “colonial, republican, and neoliberal state” (Victoria 2011:73). However, Morales’ anti-neoliberal policy has been criticized, especially as Morales’ “political indigeneity does not come out of a career of identity politics...but of adopting a globalized language of social justice” (Canessa 2012b:204). Some argue that he is a mouthpiece for transnational forces and neoliberal ideals because of his use of international systems and discourses. Robert Albro states specifically that the “organizational form of the MAS<sup>51</sup> is in fact significantly a creature of the Bolivian state’s decentralizing and multicultural measures...as one aspect of its overall neoliberal policies” (2006:214). So, here again we see the organizing structures of neoliberalism having a potential benefit (albeit perhaps an unplanned one) for previously marginalized groups (even if

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<sup>51</sup> *Movimiento al Socialismo-Instrumento Político por la Soberanía de los Pueblos*, Movement for Socialism-Political Instrument for the Sovereignty of the Peoples; Evo Morales’ political party.



the economic blowback was a negative one). Local groups, or *juntas*, part of the water-management paradigm in many communities, were a child of this same movement (Albro 2008).

In addition, Morales has promoted international human rights discourses in his own agenda, and has gained widespread international attention and support for these efforts. As Goldstein argues, “in some respects, the[...]election[...]of Evo Morales[...]can be attributed to his command of the transnational discourse of human rights,” in that he used these discourses to forward his own gains (Goldstein 2007, 49). On the one hand the framing of human rights paradigms reinforce state-citizen responsibilities and promote the state as a guarantor of rights and resources, in opposition to neoliberal aims, (Donnelley 2004:48); on the other hand they can serve to reinforce the international discourse of rights and the enforcement of rights through non-state means (e.g. through NGOs, and the superordination of transnational movements between and within state boundaries).

### **Water-Specific Considerations in Bolivia’s New State**

Bolivia as a whole does not lack water. In an “international context it is one of the countries with the greatest quantity of water available on average.<sup>52</sup>” It is the politics surrounding water, and the distribution of the sources of water topographically that is a problem (Franken 2007: 405). Thus, complexities related to this natural resource in Bolivia are many, and vary by region. The availability of WatSan systems, too, is seen piecemeal throughout the country. The Bolivian government’s “Plan Nacional de Saneamiento Básico 2001-2010,” written just after the last census in Bolivia (2001), outlines both rural and urban coverage. The document states that more than 532 thousand individuals in cities did not have potable water, and that 1.7 million did not have access to sanitation. For the rural areas, 1.8 million inhabitants did not have potable water and about 2 million did not have access to sanitation (Iturri et al. 2001:13). A distinct rural/urban difference is expressed here.

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<sup>52</sup> All translations of sources in Spanish are my own. This refers to average water available topographically by country.

Today, no one government body oversees WatSan programs, allocation and management. Rather, WatSan is governed by a combination of the *Ministerio del Agua* (Ministry of Water), the *Vicministerio de Servicios Basicos* (Viceministry of Basic Services), the *Vicministerio de Coca* (Viceministry of Coca<sup>53</sup>), the *Prefecturas de Departamento* (department prefectures), the *Gobierno Municipal* (Municipal Government), and the *Fondo Nacional de Inversion Productiva y Social* (National Fund of Productive Social Investment), all of which are subsumed under Law #2066<sup>54</sup>. This law does not promise water and sanitation to citizens, but rather regulates prices, infrastructure, and operation and management. It also manages *Entidad Prestadora de Servicios de Agua Potable y Alcantrillado Sanitario* (EPSAs), or entities responsible for granting potable water and sanitation (sewer) services. These groups include water committees, indigenous groups, cooperatives, public services, and other social groups (Ministerio del Agua 2008). In Bolivia as well, the *Fondo Comunitario de Deasrrollo Alternativo* (FCDA) , now the *Fondo Comunitario de Desarrollo Integral* (FCDI) is intimately related with water projects (including those in the Alto Beni and Palos Blancos regions). Bolivia's guide for WatSan programs dictates the aim of the document is partly directed at NGOs and cooperative agencies (2008:13). The obvious inefficiency of this system is pointed out by Thomas Perrault (2005).

In sum, while the human right to WatSan conditions holds that states and international organizations are responsible for WatSan provision, neither the government nor agencies working within Bolivia have been successful at making this right a reality for all Bolivians. Bolivia has a strong international presence related to WatSan as a human right. Within Bolivia, however, the *practice* of WatSan does not hold up to this international presence. Issues, then, with both equitable distribution and management of WatSan resources come to light in Bolivia.

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<sup>53</sup> Specifically related to infrastructural development and liaisons with NGOs.

<sup>54</sup> Signed the 11<sup>th</sup> of April, 2000.

## Spotlight on Sanitation and Wastewater Treatment

The current position of sanitation and wastewater treatment in the WatSan environment of Bolivia is complex, and unfortunately, relevant literature is limited. Authors from environmental engineering have addressed the sustainability of individual systems (Fry et al. 2010, Fuchs 2011, Muga et al. 2009, Muga and Mihelcic 2008, Reents et al. 2011), but policy and position of sanitation and wastewater treatment within Bolivia overall is constrained to state documents and NGO publications (Iturri 2011, Ministerio del Agua 2008, SENSABA 2011). These works do paint a picture, however, showing that many individuals, especially in rural areas, do not have access to sanitation services (Cali 2010, Iturri et al. 2001, USAID Website, ACDI/VOCA Website). Treatment of wastewater is not widely available and sanitation coverage is considerably less than potable water access in Bolivia as a whole. While the environmental law #1333 article 107<sup>55</sup> is followed by USAID and ACDI/VOCA in the development of new water systems (in the form of wastewater treatment for centralized sewage removal infrastructure), there is not widespread adherence to the law statewide, especially regarding industrial pollutants and wastewaters.

The reliance on complex infrastructure and technological leapfrogging through development, and the adaptation of Bolivia's needs to the international rights structure, was a specific development in the mid-to-late twentieth, and early twenty-first centuries. Agencies like USAID and ACDI/VOCA were in-place in Bolivia early in this period, implementing complex systems based on internationally-recognized sewer and waste treatment technologies, and working from specific human rights-based perspectives as early as the 1970s (USAID Website, ACDI/VOCA Website). Bolivia's reliance on international organizations for sanitation infrastructure is a specific area of interest for my study of sanitation, as these transnational

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<sup>55</sup> Article 107 reads as follows: "the disposal of untreated wastewater, chemical or biochemical liquids, objects or debris of any kind, in rivers, aquifers, watersheds, rivers, lakes, ponds, or pools of water, which pollute or detrimentally affect the waters in excess of established limits set forth by the regulations, shall be punished by incarceration of 1-4 years and a fine of 100% of the damage which was caused."

forces are part and parcel of the systems' development. Looking into how discourses of human rights, development agencies, and the Bolivian government have worked together in the provision of WatSan technologies is a key point of my work. This investigation is especially necessary in the rural areas of Bolivia, which are less researched and have less sanitation coverage overall.

### **Overview of Water Rights and Laws in the U.S. and Bolivia**

Water rights and laws which govern WatSan development in Bolivia are complex and varied in the extent to which they are actually followed and the extent to which they extend to US-based agencies. The government of Bolivia (long form "Plurinational State of Bolivia") is charged with running nine departments (Beni, Chuquisaca, Cochabamba, La Paz, Oruro, Pando, Potosi, and Tarija—this study focuses on the La Paz district). The last drafted constitution was effective as of February 7<sup>th</sup> 2009, and was last amended in 2013, and defines Bolivia as a "Social Unitarian State." The government of Bolivia is made up of an executive branch, a legislative branch, and a judicial branch. Several political groups and voting blocks exist, most notably Bolivian Workers Central groups, Federation of Neighborhood Councils of El Alto, the Landless Movement, the National Coordinator for Change, and the Sole Confederation of Campesino Workers of Bolivia (CIA World Factbook: 2013).

The state of Bolivia (or at least its representatives) has had an interest in environmental policies since as early as 1825, when Simón Bolívar banned hunting of certain wild animals (Steinberg 2001:97). When it comes to the environmental movement, however, Paul Steinberg argues that most "Bolivian observers" will usually tie the onslaught of academic degree programs in environmental/ecological sciences in the early 1970s to the larger "movement" of environmentalism at the actionable legislative and governmental level. This is not to say that this movement began a consciousness about environmental issues, but rather that it made already concerned citizens into knowledgeable advocates (Steinberg 2001:106).

In Bolivia, law number 1333 (written on the 27<sup>th</sup> of April 1992) by Jaimie Paz Zamora outlines the laws of the environment. Chapter 2 (articles 36-39) all relate to the use of water, specifically, and outline the fact that all water is the property of the state, that all planning, protection, and conservation of water are of concern to the state, that the state should work to guarantee water resources for the entire population, and that anything that could cause contamination or degradation of water resources should be controlled by the state (1992:9). However, the extent to which these laws were actionable, adhered to, or monitored/evaluated was a source of concern and upset for several individuals in my study as a whole. The money with which to ensure these resources, and the intent with which the law was drafted, were two of the main issues reported.

The Regulation on Water Pollution (Presidential Decree number 24176, written on the 8<sup>th</sup> of December 1995) outlines the regulations on wastewater in chapter 4, which focuses on wastewater effluents and sewage systems. Article 19 states that any projects that plan to allow effluent to enter bodies of water need a permit or a report that characterizes their expected effluent. This, perhaps more than any other of the laws, seems to be widely disregarded, although USAID and ACDI/VOCA did by all accounts follow these regulations for new projects. So many older projects or unwieldy solutions in transitory areas leak human waste into waterways that it becomes difficult to address what effluents are affecting which area, (even if the effluent for one project is effectively treated. La Paz, Cochabamba, La Asunta, Palos Blancos, and several other areas have raw sewage issues according to respondents for the study (personal communication, Verbyla 2014).

Several other laws are notable for the study of environmental issues in Bolivia, the RGGG (Reglamento General de Gestión Ambiental), or general regulation on environmental management, the RPCA (Reglamento de Prevención y Control Ambiental), regulation on prevention and environmental control, the RAAM, (Reglamento Ambiental para Actividades

Mineras), environmental regulation for mining activities, the RASIM (Reglamento Ambiental para el Sector Industrial Manufactorero), environmental regulation for the industry, and the RASH (Reglamento Ambiental para el Sector Hidrocarburos), or environmental regulation for the oil and gas sector (these laws were handed to me on a jump drive by a particularly well-connected community member in Sapecho (in charge of projects) and are also noted by organizations, such as the Netherlands Commission for Environmental Assessment's EIA (Environmental Assessment ) overviews (as per EIA website accessed 2013).

### **Transition**

The current status of WatSan development in Bolivia is influenced by a wide variety of factors, including colonial and post-colonial pressures, backlash from neoliberalism, class, indigeneity, gender, regional differences, and relationships with NGOs and INGOs. WatSan coverage in the country is far from complete, and elements of sustainability and ownership are problems, even for existing systems (Carter et al. 1999). Sewage removal and wastewater treatment is a serious problem, but infrastructure for sanitation, in many areas, is dependent on a fragile relationship between Bolivian communities and INGOs. The area of the Yungas is particularly interesting case. In the Yungas, the Bolivian state, international forces, and local indigenous and social makeup mitigate the implementation and feasible upkeep of WatSan systems.

Schultz and Draper caution that “for two decades, Bolivia has been told by foreign governments and institutions what it needed to do in order to prosper in a globalizing world,” but they note that Bolivian citizens were able to resist policies that were not beneficial to their communities (2008:296). I argue that this may not be accurate for some populations, and I also interrogate whether or not the need for WatSan infrastructure and aid may muddy this transnational process and mitigate individual agency.

At the state-level, tensions between the U.S. and Bolivia continue to rise. Bolivia's government (under the MAS party) has rebuffed USAID's assistance, although USAID is still involved in work in the country. Evo Morales has reportedly been angered by the U.S. funding of his opposing parties, and has dismissed their position outright. ACDI/VOCA, the agency which implemented the WatSan systems in Alto Beni, has received funding cuts from USAID (reportedly as a response to this tension) and is now leaving the country. Thus the sustainability of WatSan systems in the Yungas may no longer be supported by either the government or the international community.

### **Discussing WatSan Initiatives Outside of Anthropology**

WatSan initiatives outside of anthropology have a clear and important relationship to my study. They are integrated throughout this work, but in order to orient readers from a variety of disciplines, I have included this section as a kind of road map or clear introduction to these projects, methods and theories. This portion of my work outlines major WatSan frameworks, particularly those used by the discipline of engineering and by NGOs, and addresses the ways in which these theories drive WatSan approaches. I also present limitations of these approaches, largely generated by their practitioners, which pave the road for better social understanding, cultural knowledge, and the inclusion of anthropological approaches.

### **Water, Sanitation, and Hygiene Approaches**

WASH approaches generally value human-centered aspects of WatSan including access, improved sources, and hygiene training and employs an anthropocentric view of WatSan technologies and program placement, based in the right to water, sanitation, and health. NGOs such as MedAir, the United Nations High Commissioner for Refugees (UNHCR), and the Gates Foundation use WASH approaches. WASH approaches are also used by USAID and Australian Aid (AusAid), and WASH has been applied in disaster settings (Brown et al. 2012). Anthropologists have been involved in WASH issues, and have offered contributions to

this framework, including critical theory (e.g., Deal 2012, Deal et al. 2010). The largest shortcoming in the WASH approach is the lack of focus on the environmental and ecological impact of water systems resulting from changes to the distribution of water sources. Very little attention is given to watershed management, environmental impact, and ecological factors as they are eclipsed in favor of a human-centered approach. The WASH campaign has failed to adequately outline that if water resources are impacted negatively or managed ineffectively, this will impact the availability of clean water resources. The International Water and Sanitation Centre (IRC) in The Hague, Netherlands, is at the forefront of Water, Sanitation, and Hygiene (WASH) based approaches. However, recently they have begun an initiative to pair Integrated Water Resources Management (IWRM) approaches with WASH programs. While some tensions have arisen between IWRM's water-resource approach and WASH's local approach, now the IRC is looking to outline the fact that "poor water resource management *is* impacting water resource delivery" (IRC 2008:1). The relationship is clear—poor sanitation and pollution is related to fresh water contamination (El Azar 2009:169, Moe and Rheingans 2006:48). This is also reflected in environmental anthropologists' pushes to include ecological and environmental concerns in human-centered issues (e.g. Robbins 2004).

### **Integrated Water Resource Management (IWRM)**

Integrated Water Resource Management (IWRM) is one of the foremost paradigms for looking at water and water management (Calizaya et al. 2010, Casteletti et al. 2007, Durham 2002, Horlemann 2012); this is a paradigm that anthropologists have been integral in critiquing and employing. Furthermore, NGOs such as the United Nations and the IRC use this approach. As Ben Orlove and Steve Caton state, "IWRM has become the new, and many would claim, the hegemonic paradigm for discussing, legitimizing, and implementing policies regarding the management of the world's water resources (2010:408). IWRM grew out of a need for addressing the management of fresh water on a greater scale than just addressing human-



centered need, especially the need for addressing scarcity and distribution (Hiwasaki 2012:513, Huq 2012, Radif 1999). As Klaver explains, “because water connects all elements of society, an integrative water approach, one that views local problems of water quality and quantity in transregional and global political contexts, becomes essential” (2012:27).

Unfortunately, the paradigm lacks any one specific working definition<sup>56</sup>, and instead has a *mélange* of meanings, wrapped together with the stamp of “holism” (Allan 2012). Hiwasaki (2012) argues that it does not adequately include culture in its analysis, whereas Orlove and Caton (2010) feel that it struggles to extend notice to “concrete” settings and Marcela Brugnach and Helen Ingram argue that it does not adequately allow for improved decision-making structures (2012). Local peoples’ positions are not often included in paradigms surrounding IWRM, although “their importance is being recognized by those working on the ground” (Hiwasaki 2012:514). Orlove and Caton also criticize IWRM frameworks for having a lack of attention to political conceptualization and its devaluation of water’s cultural meaning outside of its tangible use (2010:419), and IWRM has been critiqued for its reliance on project-centered approaches (Allen, C. 2012). The approach has been criticized for the uncertainty in the M&E process of IWRM including lack of models, indicators, and scales for assessment (van der Keur et al. 2008). Its shortcomings, including lack of cultural reference in the organizations placing WatSan programs, lack of political perspective, and lack of a clear M&E approach, leave room for further thought and for anthropological action (and I argue for infusion of other theoretical and methodological paradigms).

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<sup>56</sup> This is a critique raised by Orlove and Caton (2012), one with which I agree. The definitions that are used in the literature outside of anthropology, such as the definition from the UN in 1992 “...a process to promote the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital systems” (cited in Calizayu et al. 2009:2268), are catch-all to the point of meaninglessness. Furthermore, they neither show distinct methods nor distinct approaches.

## Life Cycle Assessment (LCA)

Life cycle assessment (LCA) has become a common approach in engineering and development for evaluation of environmental sustainability. Life Cycle Approaches have been applied directly to issues of wastewater treatment and sewage collection infrastructure, which I argue make them very well-suited to support a social analysis of wastewater impact (Lundin 2000, McConville and Mihelcic 2007, Oakley 2004, 2005). LCA is broadly construed as a tool for addressing environmental efficacy and impact of a specific product or piece of infrastructure, from the “cradle-to-grave” (Dennison et al. 1998:26). This process is holistic for the product/piece of infrastructure, but it is centered specifically on materials and costs (both physical and environmental), and not on the social management of these materials and costs (except for direct transport and disposal labor costs). Main components include “goal definition and scoping, inventory analysis, impact assessment, and improvement assessment” (see Dennison et al. 1998:27 for more information). LCA has been applied to wastewater treatment systems in the past two decades, with varying results in the western environment. LCA is used to compare and contrast the perceived benefits of new wastewater treatment technologies (Ortiz et al. 2007, Renou et al. 2008).

However, it has been argued that that traditional life cycle approaches were inappropriate for developing country environments. Jennifer McConville and James Mihelcic sought to rectify this inadequacy by creating a matrix which includes both traditional life cycle approaches<sup>57</sup> and five sustainability factors<sup>58</sup> which they gained through a review of development literature (2007:939). They argue for an inclusive framework wherein life cycle thinking is linked with concepts of sustainability. The approach is not meant to provide a

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<sup>57</sup> According to McConville and Mihelcic: “a life-cycle thinking approach is used to assess how project sustainability can be improved throughout project life...five stages ...represent the life of a development project: (1) needs assessment, (2) conceptual designs and feasibility, (3) design and action planning, (4) implementation, and (5) operation and maintenance” (2007:937).

<sup>58</sup> Including sociocultural respect, community participation, political cohesion, economic sustainability, and environmental sustainability (2009).

“universal tool for comparing the success of water and sanitation projects” (2007:946). Rather, it is meant as an M&E tool directly marketed to engineers and development practitioners so that they can analyze their own approaches in developing country settings. Similar initiatives are also seen in the work of Rebecca Barnes and Nicholas Ashbolt (2010:79), Annelies Balkema et al. (2002), and Alexander Bakalian et al. (2009). These assessments’ elicitation of social difficulties provides an “in” for an anthropological eye—it also suggests that the social aspects of WatSan are complex and that wide-reaching, formulaic approaches to monitoring and evaluation may obscure differences in cultural and social feasibility. As James Mihelcic states, “despite the great promise of engineering, engineering projects do not always have their intended effects on people’s lives...nontechnical considerations are not always taken into account” (Mihelcic et al. 2009:7). Short-term analyses of multiple programs, using methods that gain information on system efficacy, sludge buildup, and influent/effluent analyses for parasites and pathogens, to address appropriate technology concerns for wastewater treatment are common (Fuchs and Mihelcic 2011, Muga et al. 2009, Muga and Mihelcic 2009, Oakley 2010, 2005, 2004). These studies found that a combination of sociocultural and infrastructure “fit” issues impacted the longevity of the systems<sup>59</sup>. Post-construction concerns are of increasing importance to environmental engineers in general (Lockwood 2003). It has also been argued that microbial risk assessment and environmental impact assessments, when added to the life cycle assessment/sustainability approach could be useful.

Anthropologists have not had a distinct role in life cycle assessment; however, the components of life cycle assessment are applicable here as theoretical background for looking at the systems put into place, and as a complementary field of study to a political ecological

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<sup>59</sup> Fuchs and Mihelcic argue that “an appropriate sanitation system should have the following characteristics: modular technology and infrastructure; accessibility’ minimal use of human/financial/natural resources’ a representative and accountable water committee; a cost recovery plan...and training for users/operators/managing committee” (2011:133). Oakley finds that “even simple resilient [wastewater treatment] pond systems will fail if their design, implementation, operation and maintenance, planning, and municipal commitment are not suited to local needs and conditions” (2005: 48)

approach. Much of the critique within political ecology is the lack of an ecological eye and “hard” data which develops the costs/benefits of environmental change in social settings (e.g. Vayda and Walters 1999). Thus, encouraging an interdisciplinary environment wherein the benefits of life cycle assessment approaches and the benefits of ethnographic research are married is a way forward in WatSan. While I do not employ LCA techniques directly, my findings mesh well with LCA needs.

### **Appropriate Technology (AT)**

Appropriate technology (AT) as an approach is intended to encourage the sustainable use of effective technologies that have been demonstrated as relevant and useful for the societal context in which they are placed (Murphy et al. 2009). The start of AT is widely attributed to E.F. Schumacher’s (an economist’s) book *Small is Beautiful* (originally published in 1973). While AT’s applications are more broad than simply WatSan technologies, the application of AT principals to WatSan projects was evident as early as 1980 (Kalbermatten et al. 1980). AT holds that part of the solution to achieving water and sanitation coverage is to ensure that the technologies used to afford WatSan coverage are environmentally, socially, and economically reasonable (Murphy et al. 2009). A Murphy et al. state, “although engineers have strong educational backgrounds in thinking systematically and are well-equipped to solve problems, on many occasions they have failed to understand the social dimensions around technology transfer and implementation” (2009:159). These social dimensions are key to ensuring that WatSan projects work in the long term, and, from a perspective of development, ensuring that the technology is not just modern or state-of-the-art, but workable in the context that it is placed. Similar concerns which are raised in the Human Right to WatSan are raised in an AT approach, specifically affordability, sustainability, and, of course, appropriateness. Culture and social appropriateness are specifically subsumed in the AT process, however the

ways in which “appropriateness” are tracked or monitored are unclear. AT is also specifically focused on poverty reduction as an aim more than the provision of certain basic “rights.”

Appropriate technology has become a full set of requirements of engineers working in the developing world. James Mihelcic et al.’s *Field Guide to Environmental Engineering for Development Professionals* details participatory approaches to design and management, ways to assess community leaders, outlines how to ascertain community need, and gives step-by-step instruction on many aspects of water, sanitation, and indoor air (2009). The book emphasizes appropriate technology throughout, which is defined in his work as the “use of materials and technology that are culturally, economically, and socially suitable to the area in which they are implemented” (2009:12).

While anthropologists are well-suited to addressing cultural and social concerns for technology transfer, anthropologists also critique the ways in which technologies are socially stratified. While making technology appropriate (in some cases by making it simpler) is largely beneficial, we must remember the inherent power relationship that this exchange represents. As per Romer (1992:89), public institutions will continue to be compared and contrasted with one another on the basis of quality, and the areas which are the most successful will be those “with the most competent and effective mechanisms for supporting collective interests” (Peet and Hartwick 2009:62). We must be careful, therefore, to make sure that technologies are both appropriate and equitably defined. When I refer to “appropriate technologies” in my work, I am not speaking colloquially, but instead am referring to the body of theory and all that is imbued in an AT approach.

### **Quantitative Microbial Risk Assessment (QMRA)**

Quantitative microbial risk assessment has been used to address wastewater effluent and sludge’s reuse possibilities whilst addressing potential risks to human health and wellbeing. While life cycle assessment studies show that reuse of wastewater products could be beneficial

to the overall environmental and economic costs of the systems (Cornejo 2013, Oakley 2010), anthropocentric harm must be addressed. QMRA estimates human risk by analyzing pathogen concentration, removal, inactivation, and consumption in wastewater treatment (and drinking water treatment) technologies (Pettersen et al. 2006). However, QMRA is usually based on westernized consumption and handling models, and has little space for the addition of cultural or social issues that could contribute to overall risk (Verbyla et al. Nd). An interdisciplinary team of which I am a part, with Matthew Verbyla (environmental engineering) Erin Symonds (marine biology), and Ram Kafle (statistics)) is working to address these limitations by ensuring that culturally-relevant consumption and treatment practices are considered in the QMRA approach. Overall, QMRA can help to wed issues related to infrastructural, environmental, economic, and human health in WatSan focus areas. For more information on QMRA, I highly recommend the Michigan State Center for Advancing Microbial Risk Assessment's webpage<sup>60</sup>, and the several projects, publications, and dissertations/theses on the topic that were completed as part of the initiative. QMRA can help to decisively link AT and IWRM approaches with WASH and anthropocentric harm concerns.

### **Synthesizing Viewpoints**

Again, while this section is by no means an exhaustive list of all the approaches to WatSan development theories or policies, these each have been outlined here to address their importance for my study as a whole, either foundationally or conceptually. Although each approach has concrete benefit and addresses existent and emergent needs in WatSan development, none adequately includes or analyzes social and cultural data. These approaches, however, provide insights and data complementary to an anthropological approach (and vice versa). By encouraging a synthesis of both disciplinary and extra-disciplinary approaches to WatSan research, I argue that overall WatSan provision and development, and

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<sup>60</sup> <http://www.camra.msu.edu/qmra.html>

certainly WatSan research methods and approaches, can be improved. Using political ecology as a frame meshes well with the perspective of these approaches, which often prize the ecological or the physical over the cultural or the political or vice versa. Due to my unique position as part of an interdisciplinary group of researchers funded to work in the Alto Beni region, I have a distinctive opportunity to weave these approaches together in a tangible way.

### **A Note on Methods**

This methods section is meant as a guide through the methods, technology, and requirements of my project. While my methods are discussed throughout the book, this section gives a targeted run-through of the full project with all of its components, including which components work to answer which research questions, and the ways in which data was collected and analyzed. I also give specific reference to ethical considerations in my research.

Anthropological methods provide keen insights and rich data for WatSan issues. However, if the discipline continues to work parallel to, and not in concert with, engineering and development approaches, much of the benefit of this work will remain in academic circles rather than benefitting a wider sphere. Not only must WatSan focus be interdisciplinary, so too must be the methods for M&E and the formats with which we analyze and present our data. Anthropologists are in a unique position to be able to critique the structures of, respond to, and enhance the study of WatSan. To be relevant we must answer the call directly and be willing to speak to the process of WatSan. We must also be willing to speak to all of WatSan's players and stakeholders. I situate my own research to follow this trajectory and to fill the gap in knowledge related to WatSan policy, programming, research, and M&E processes.

### **Research Questions**

The overall objective for my project was to understand how the water system infrastructure and community management model intersects with constructions of rights and community agency, and the impact of this relationship on members of the community. These

rights discourses were also to be contrasted with state-level policies on rights, water, and environmental protection. In response to findings from my preliminary study, specific attention was given to issues of gender and women's rights vis-à-vis water and development. In essence, the research extends beyond the broad investigation of water rights and seeks to answer the question of how the "right to water" can be best implemented and sustained in community contexts. The research also specifically analyzes the differences in governance and practice surrounding the potable water system vs. the water treatment (sanitation) system. I seek to address the ways in which community members and development professionals weigh the relative importance of potable water vs. sanitation programs and infrastructure. I also seek to address whether or not class, gender, age, and/or ethnic disparities result in differing responsibilities surrounding water and sanitation, and if these disparities appear likely to affect the long-term functioning of the water system.

My main hypotheses for this research are as follows:

H1: Global (transnational) human rights discourses will drive development organizations' frameworks surrounding water and sanitation.

H2: Residents of Sapecho will have limited knowledge of human rights discourses surrounding water and sanitation.

H3: Residents of Sapecho will believe that water is a human right, and will have a working rights discourse surrounding water that is local in nature.

H4: Residents of Sapecho will exhibit a disconnect between their rural indigenous identity and the indigenous identity of labor/indigenous groups in urban areas as surrounds water.

H5: Residents of Sapecho will point out problems with the infrastructure of the water system put into place (potable and treatment).

H6: Residents of Sapecho will point out issues with water rights and WatSan and ecological rights discourses (at the global, national, and local levels) based on on-the-ground issues with infrastructure, governance, and use.

H7: Residents of Sapecho will report problems with the community management model.

H8: Residents of Sapecho will have organically begun to work out issues with the management process in regard to governance and upkeep, but will not have adjusted for marginalized groups within the indigenous area (including class, age, ethnicity, and especially gender).



H9: Residents of Sapecho will provide information on how to better water systems' implementation.

H10: Global, national, and local rights discourses surrounding water, environment, and indignity will clash and blend within the context of water systems development in the rural area of Sapecho.

H11: Residents of Sapecho will feel that potable water is a right and value it more strongly than they will feel that sanitation is a right, and they will value the potable water system more than the sanitation system.

H12: Residents of Sapecho will be more engaged in voluntarism and upkeep surrounding the potable water system than the water treatment and sanitation system.

In addition to these hypotheses, I was aware that my research would be iterative, and would build upon emergent themes and ideas expressed by community members. My research was dependent upon my ability to be a part of the WatSan process in Sapecho and an experiential approach was central to my research design and aims. The driving hypotheses were beneficial as a construct, but did not constrict my ability to gain information from on-the-ground experience and situated knowledge.

### **Theory of Methods in WatSan**

Anthropologists working with issues of water and sanitation (although perhaps not explicitly involved in M&E of water *and* sanitation programs) have completed studies which employ methods that could transfer to M&E approaches. Ben Orlove's *Lines in the Water: Nature and Culture at Lake Titicaca* (2005), Kelly Alley's *On the Banks of the Ganga* (2002), and Veronica Strang's *The Meaning of Water* (2004a) are each touchstones for my work—and their methods elicit deep understandings of WatSan issues. Furthermore, they each use a suite of methods to address the wide-reaching concerns seen in water management. Orlove's methods include interviews, surveys, detailed field notes, and collaboration with NGOs; Alley's includes NGO collaboration, participant observation, analysis of traditional stories and folklore, discourse analysis, and analysis of court documents and legal statutes; and Strang's includes interviews, participant observation, and document analysis (including legal documents and

letters) related to water. In these approaches, we see some of the most classic of anthropological methods, such as participant observation<sup>61</sup> and informal<sup>62</sup> or semi-structured interviewing<sup>63</sup> being combined in innovative ways for WatSan study. Taylor (2012), Churchill (2009), Hadley and Wutich (2009), and Wutich and Ragsdale (2008) use suites of methods such as this as well in order to capture the wide range of influences on water issues and the environment.

Structured surveys are seen less often in anthropological approaches to WatSan issues. But “anthropologists are finding more and more that good survey technique can add a lot of value to ethnography” (Bernard 2011:188). As structured surveys can be employed by research assistants in-country with proper training and can be completed quickly, they may be particularly appropriate for WatSan M&E approaches. Orlove (2004) employs a survey to gain information about individual daily practices at Lake Titicaca, with much success. Amber Wutich frequently employs surveys with random sample methodology, usually as a cornerstone of a mixed-method approach (Wutich 2009a, 2009b, Wutich and Ragsdale 2008). As a result of this survey use, I argue that her work is well-suited to external use and readability.

Wutich et al. completed research on the data gained from focus group<sup>64</sup> and individual interviewing techniques. They found that focus group and interview data (including responses related to water supply) were similar when the topic “related to power, politics, or privilege is only somewhat or moderately sensitive” (2010:105). Thus, focus groups could be used in

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<sup>61</sup>To define participant observation I like De Munk’s statement that by observing in an engaged way one can gain thick description, access to unscheduled events and behaviors, and access to “backstage culture” (De Munk 1998:43).

<sup>62</sup> This approach is a “conversation” with the goal of “the researcher to participate in naturally unfolding events and to observe them as objectively as possible” (De Walt 2002:120).

<sup>63</sup> Bernard notes that “in situations where you won’t get more than one chance to interview someone, semi-structured interviewing is best...it has much of the freewheeling quality of unstructured interviewing and requires all the same skills, but semistructured interviewing is based on an interview guide” (2011:158)

<sup>64</sup> “Focus groups are recruited to discuss a particular topic” (Bernard 2011:172). Focus groups are usually comprised of 6-12 people and are meant to gain information related to that group’s perceptions.

particular situations to gather information that could not be gathered in an interview, or to supplement responses in interviews with marginalized or specific groups (which I argue could be of particular concern in WatSan studies). They can also complement, but not replace, surveys (Bernard 2011:173).

Within the field of ecological and environmental anthropology, anthropologists are working toward new methods and frameworks for the study of environmental issues, including water. Cassagrande et al. use a method called “adaptive experimentation” wherein “hypotheses are added in an iterative process to reflect the uncertainty that accompanies ecological and social complexity” (2007:126). They employ an interdisciplinary approach, one that fuses theoretical and methodological benefits from the realms of biology, anthropology and ecology.

The technique of using community guidance to map future water use expectations in communities has been tested and was beneficial in conservation projects (Hulse et al. 2004). In relation to this, Rebecca Zarger argues that “creating graphic representations of the complexity inherent in human ecosystems is heuristically valuable as we continue to explore change in human ecosystems, past and present” (1998:83). The use of mapping and graphic representation is also supported by works in Geography such as that of Nancy Lee Peluso (1995). I find that mapping can be of heuristic and interdisciplinary value, as mapping practices can translate data and provide visuals to supplement anthropological findings.

The ways in which anthropologists have looked at WatSan issues—specifically suites of methods which are mixed to include both qualitative and quantitative measures, “studying up,” and more exploratory methods such as mapping could blend nicely into M&E initiatives, especially when synthesized with participatory and rapid approaches that are seen in the wider discipline. These methods must be articulated, employed, and shared in ways that are widely readable and useful, however.

## **Data Collection**

I employed a suite of methods for this research. This was done purposefully, both to allow for triangulation of data and to gather information from several levels of the WatSan development process. I had the benefit of a pilot, wherein I employed focus groups (n=2), semi-structured interviews, (n=12), and structured surveys (n=322) in order to gather data about the community perceptions of impact and efficacy from complex WatSan systems. The pilot included two communities, Sapecho and San Antonio. Sapecho and San Antonio both had WatSan systems which included potable water, sewage removal, and wastewater treatment. For my full research, I chose to focus in on the position of one community, Sapecho. Sapecho had a more complex wastewater treatment system (bioreactor and treatment lagoons vs. just treatment lagoons). Furthermore, it had the system in place for more years and exhibited a greater amount of organic “fixes” and management ideas.<sup>65</sup> For my dissertation research I employed semi-structured interviews with development professionals (n=11), focus groups (n=4), semi-structured interviews with community members (n=32), structured, systematic sample surveys (n=138), community member-led mapping (n=7), and participant observation<sup>66</sup>.

## **Technologies for Data Collection**

I employed several different technologies (cell phones, livescribe pens, GPS-enabled cameras) as well as software packages (KoBo, Livescribe, Excel, SPSS) for my work. I present the types of technologies which constitute new methodologies and approaches in anthropology here.

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<sup>65</sup> San Antonio’s system was newer and the community had less time to get to know the management of the system and to work out committee changeovers, responsibility, and relationships with the development agencies.

<sup>66</sup> Spanish is a second language for me, and thus the use of a native-speaking interpreter was employed in interviews and focus groups.

**Kobo.** KoBo<sup>67</sup> is a set of software that enables research using mobile, android devices. KoBo is an implementation of ODK collect, a base code for survey programming. This is an example of open-source, non-competitive cooperation, and the result is highly effective. KoBo toolbox has implemented several supporting pieces of software that aid the researcher in creating assessments, collecting data, syncing that data to a format from which it can be analyzed, and mapping the data. KoBo supports a variety of information types, including text, numerical, single answer, multiple answer, cascading questions, geopoint, audio, video, photo, and barcode data. KoBo is supported by the Harvard Humanitarian Initiative. I employed KoBo software for the whole of my survey data collection, including KoBo form (to assist with form design and programming), KoBo collect (for data collection using android cell phones), KoBo sync (to export data into .csv and .xml formats), KoBo label (to label SPSS database) and KoBo Map (along with Google Fusion Tables) to analyze data gained from GPS data point Mytracks tracks. Through my use of KoBo software, I was able to gather survey data from individual respondents in the community and to look at these responses based on location in these mapping software packages.

**My Tracks.** MyTracks<sup>68</sup> is an application on the android operating system that enables the user to track a path using GPS coordinates. MyTracks allows you to gauge speed, distance, and elevation as well as annotate your paths. I used the software to map paths to water sources, delineate boundaries between neighborhoods and man-made markers (between commercial and residential areas, for instance), and to mark specific waypoints (bridges, garbage drops, swimming/bathing locations, and laundry sites).

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<sup>67</sup> For more information on KoBo visit: [www.kobotoolbox.org](http://www.kobotoolbox.org).

<sup>68</sup> For more information or to download My Tracks on your Android phone visit: <https://play.google.com/store/apps/details?id=com.google.android.maps.mytracks&hl=en>.

**Livescribe.** Livescribe pens<sup>69</sup> offer a way to take notes and record voice during interviews and mapping exercises. The Livescribe pen incorporates a small camera at the end, which records the user's writing, as well as a small microphone that simultaneously records the user's voice. These two processes are synced. If the user presses a part of his/her notes with the pen, the audio will play back starting from that moment. These files are also downloaded into .pdf format so that the researcher automatically has a copy of notes and audio.<sup>70</sup>

## **Analysis**

The data collected through the research methods used in my dissertation provided many avenues through which to analyze and present data and findings. In order to speak to both qualitative veracity and depth of knowledge as well as quantitative significance, and in order to marry these different types of data with spatial and geographical data, I worked through a variety of analysis formats.

*Qualitative Data:* For qualitative data (interviews and focus groups) I worked using a grounded theory approach, allowing themes to emerge from my research and from patterns in responses. All interviews and focus groups were transcribed by a research assistant. Field notes were taken in notebooks and/or with livescribe pens and then transcribed by myself. I employed MAXQDA software for coding and analysis.

*Spatial Data:* I employed Google maps (with fusion tables) and KoBo map software in order to address changes in data vis-à-vis location and topography. GPS points collected from

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<sup>69</sup> For more information about Livescribe visit: <http://www.livescribe.com/en-us/>.

<sup>70</sup> The data management plan for my work was split between the digital data (surveys), audio recordings, and field notes. The digital data for the project was synchronized (copied to .csv and .xml formats) nightly from all digital devices used in the field that day. The data was then checked for accuracy (ensuring that there weren't any accidental entries (e.g. accidental entry of one part of town vs. another), to ensure that each survey took the expected amount of time (30-60 minutes), to ensure that each enumerator hit their goals for the day, and to ensure that GPS data was collected. Any potential issues reported by enumerators were entered in an error log. Experimental analysis to look at trends was also conducted. These files were saved on both my computer and a backup hard drive. Audio data was downloaded day-of and saved to my computer and backup hard drive. Handwritten notes were transcribed to digital format as soon as I was able. These notes were then kept on my computer and backup hard drive.

individual surveys were grouped by neighborhood as well as by data collection point and were then analyzed using various mapping settings.

Although, in this methods insert, it is beneficial to explain specific analysis techniques for each set of data apart, I will note that the analysis process was iterative and fluid and that data sets were triangulated continually throughout the write-up process. Meanings and findings on each level are enriched by the data collected by other research techniques.

### **Presentation of Data**

In order to address and engage several different audiences (notably individuals within the fields of anthropology, environmental engineering, and international development) I worked to ensure that data is presented in a variety of ways in this dissertation. Data is presented through maps (employing google maps), graphics (using Excel chart maker), photographs, text, thick description, and representative quotes. Throughout the work I aim to both explain the relevance of this approach to the wider audience and to highlight the value of the anthropological perspective and ethnographic analysis. At its core, this is an ethnographic piece—but there is also something here for everyone, and I've tried to ensure that any reader has accessible and multi-format access to representations of data.

### **Ethics**

Through my research I intended to and did work closely and continuously with the community of Sapecho. Additionally, I worked to create lasting partnerships and relationships with development agencies in Bolivia. Thus, I had and will continue to have professional responsibilities to both groups. I worked in concert with both populations to address the self-reported issues and concerns raised and in order to put the development community's framework in communication with local, long-term, on-the-ground concerns. This positionality is akin to what Restrepo and Escobar call "situated knowledge," and thus calls for multi-level considerations (Haenn and Casagrande 2007:102). Further, as Paige West notes, "we have to

think carefully about how we translate socioecological lives, and we need to locate the politics of translation, value, and spatial production at the heart of engaged environmental anthropology” (West 2005:640). As I want the findings from the research to be “beneficial to all involved” (AAA Code of Ethics 1998) I considered the policy and advocacy positions I could take in the research, as well as the eventual use of the research itself. In the end, my dissertation and approach is well-situated in the discipline of applied anthropology and has clear policy recommendations—however it is not activist anthropology and does not work to speak for or on behalf of any community with whom I work. Instead it speaks to the systemic and emergent issues in WatSan development and management that, I hope, will provide benefit to all involved, whether it be direct or indirect. I created and provided both academic and community-based deliverables for the research, and have worked to make my findings applicable and translatable to development policy. All respondents had reasonable expectations regarding the use and applicability of their responses. As the research was completed through an interdisciplinary program (with USF Engineering) I also had a responsibility to my colleagues and to other anthropologists. Thus, I must ensure that the research itself as well as the way that I release the findings does not endanger others’ ability to work in the area and/or with the groups involved. In order to ensure this, I am very careful to report honest and representative results, but also have been particularly careful to occlude as best as possible individual details about respondents. My work did not include minors (under the age of 18).

### **Context and Limitations**

While every effort was made to protect the identity and position of respondents for the research, reasonable and transparent limitations did apply—both at the community and the NGO professional levels.

*NGO Professionals:* NGO professionals were solicited for participation in research based on their knowledge of WatSan work in Sapecho or of funding mechanisms for Sapecho.



Respondents from USAID, ACDI/VOCA, and other aid agencies are included in the work. For the benefit of the respondents, individual sensitive responses are not attributed to specific aid agencies, but rather aggregated for representative responses. Where relevant, information gained from individuals was included in background and context sections and here was attributed to the agency, not the individual. NGO respondents specifically requested that their identities not be shared and that their individual responses not be attributed to their specific agencies' official positions, however. While aid workers are not able to speak on behalf of their agencies or the U.S. government in these cases, and as their personal responses may have deviated from company policy, this was a necessary constraint. In the end, this protection allowed these individuals to share more openly and truthfully their experiences and personal perceptions regarding WatSan policies and programs.

*Community:* Community-level research participants were made aware of reasonable constraints on their anonymity. During focus groups I could not assure individual respondents within the group that others in the same focus group would not share their comments or responses with others, although respondents were asked to respect the privacy of all. Furthermore, Sapecho is a small town, so often individuals may have seen respondents answering surveys, participating in research, or conducting interviews—although, unless invited by respondents, passers-by did not hear the specifics of their responses. The research hinged on a relationship with the water committee, and individuals in the town were aware that the water committee and my team had a working relationship. All individuals who participated in the research knew that the town name would be reported, and thus those with high-level or integral positions in the research were aware that their position may cause them to be identifiable (with a bit of work) in the research, although they were assured their names would not be used.

*Potential sources of bias:* The water committee announced our presence as researchers on local television and radio programs. This and word of mouth aided greatly in our response rate.

The team lived, ate, and worked within the community, but our stay benefitted some more than others (lodging managers, restaurants, etc.). However, we did make an effort, as much as possible, to ensure that our food, beverage, and other needs were distributed amongst those community members involved in the service industry (i.e. lunch and dinner were eaten at different restaurants during the time when students were in the field site, and when I was there alone I varied my grocery and food preparation costs).

As our program had worked in the area for 6 years, relationships with community members could have been impacted by these past relationships, although my tenure as a researcher in the area was only over a two year period. At the start, some community members did confuse my team and me with representatives of an aid agency (USAID or ACDI/VOCA), but this was quickly dispelled when I explained our student status. As this research was conducted under a collaborative grant with environmental engineering students, simultaneous research on water quality and infrastructure was being completed during 3 weeks of my team's field stay, and expectations of engineering assistance or fixes were clear. The engineering team did attempt to fix part of the water system while I was in the field, which I discuss in this work (see chapters 3, 7). The wider team consisted of individuals from a variety of backgrounds, including those of American, Peruvian, Columbian, and Bolivian descent, and those who spoke Spanish at a variety of levels (from native proficiency to little-to-no working knowledge).

### **Logistics**

Logistics were handled partially by myself and partially by staff hired under the NSF grant. Nathan Reents, a past NGO professional in the Alto Beni area and a current environmental engineer, worked in Alto Beni for a number of years. Nathan handled a great deal of logistical concerns, including travel, lodging, food, and introductions to local leaders. Gabriella Gemio, a Bolivian national and ecological engineering student at Universidad Tecnologica Boliviana (La Paz) (our partner institution) handled similar concerns for the group,

including travel itineraries, health-related concerns, and relationships with the University. Once in Sapecho, I ran the logistics for the team working on my project. This included all research timelines, daily tasks and procedures. However, Nathan and Gabriella were constant sources of support.

**Research Assistants.** One of the main goals of the NSF project was fostering a relationship and learning experience between U.S.-based graduate researchers and U.S. and Bolivian undergraduate students. As a part of this, I was tasked with teaching research methods, ethics, and providing a field research experience to students. In turn, the students acted as research assistants on my project, collecting survey data with KoBo mobile data collection, and support and interpreting during interviews and focus groups.

### **Addressing Data Collection**

For my research, I employed a suite of methods, and worked collaboratively with several research assistants. However, one can never account ahead of time for on-the-ground interventions in one's plans. Ethnographic data collection takes a bit longer and is a bit more open to a change in plans or perspective, as any anthropologist knows. Anyone truly hoping to be a participant observer in a community's day-to-day practice must expect that life will sometimes get in the way.

During the research, such things as holidays, wild and domesticated animals, illness, weather, and a healthy appreciation for personal safety all got in the way of the day's approach to gathering information at least one time or another. In La Paz, a parade would often hinder data collection, shutting down the city for a full day, while also offering good information about the cultural history of Bolivia.

One day in Sapecho, my colleague in engineering couldn't get his sample due to an escaped bull. From my fieldnotes:

*Um, funny thing—the engineer in the group couldn't get his [wastewater effluent] sample tonight because a bull had gotten out and was blocking his path to the river. Never know what is going to happen. He had to go and tell the guy that owned the land—"Uh, I think your bull got out.*

But at least we met the neighbors. The students working as part of my research team ran into a "very terrifying" wild boar:

*The students had an eventful day today, but they're in good spirits. A "wild boar" chased them, which they played up as quite an elaborate and death-defying ordeal. They then admitted it was a baby, but apparently it was still fast. They saw parrots and monkeys, too, which was cool for them. The parrots laughed at them, though, which they did not appreciate.*

They spent a while with the guy that owned the parrots, though, and he gave us great information about sewage coverage in the area.

There was also the time my research assistant, James, and I ran into a perfectly domesticated pig:

*We tried to find a way across to the other side of the river today, but right as we came to a place that might have offered a way to a log or a trail or something to cross to the other side we ran into a pig, seemingly out in the middle of nowhere in a clearing, tied up and surreptitiously chewing on some grass. I figure, why not, let's just walk by. But the pig made quite a bleating noise. Worried about what it might do, not trusting its crumbling tether, and all of my knowledge about pigs imparted by the movie "Snatch," we decided to figure out another way around.*

The good news was, we were going the wrong way anyway.

Basically, my point with all of this is that we worked to experience as well as assess WatSan practice in Sapecho. In order to do this, we tried to stay flexible, employed a rigorous but not rigid data collection schedule, and tried to appreciate, absorb, and engage in local culture as much as possible—especially when things didn't go quite as planned.



Figure 2: "The Pig"  
Sapecho, Bolivia 2012  
Photo by (an intimidated) Maryann Cairns

**CHAPTER 3:**  
**DEVELOPMENT PROFESSIONALS AND TRANSNATIONAL ORGANIZATIONS IN WATSAN**  
**IMPLEMENTATION**

Governmental and nongovernmental organizations (GOs and NGOs, respectively) with ties to the United States have been integral to the development of water and sanitation (WatSan) projects in Bolivia, especially in the last three decades. The United States Agency for International Development (USAID) works with several different agencies in Bolivia<sup>71</sup> As discussed in chapter 2, USAID's relationship with Bolivia has been tenuous and fraught with several issues. This chapter is centered on interweaving the overall political ecology approach of my research with specific literature critiquing development and human rights in the WatSan sector. To accomplish this, I introduce the individual voices of development professionals involved in the WatSan process in Bolivia. Focus is given to relationships between aid agencies, development practitioners' views on right to WatSan, concerns with gender and development, local abilities, and coca proliferation/nonproliferation. My work is conducted in concert with NGOs and government agencies working in Bolivia; I've used a respondent-driven, grounded theory approach to elicit potential issues on the ground in WatSan development<sup>72</sup>.

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<sup>71</sup> ACDI/VOCA, the focus of this research, is by no means the only agency that received funding from USAID. Abt Associates, UNICEF, HAHO, The Ministry of Health, and PRO-SALUD, among others, were funded for various "alternative development" projects.

<sup>72</sup> I'll admit that I started this research as a development critic and as a development scholar. My master's degree is in International Development. The reason I ended up studying anthropology at all (in brief) was due to my feeling that the human aspects of development were often left out. I am not, however, someone who feels that development shouldn't happen, or that development as a process is so overwhelmingly colonial or ethnocentric that it should not happen. I usually say that I'm critical to the point of action not critical to the point of inaction.

## **What is Transnational Development?**

The system of WatSan provision in Bolivia does fit within the nebulous idea of transnational action/development in the global arena (where transnationality refers to a system in which non-state actors work outside the realm of nationalism (Goodale 2009)). That said, the position of Bolivian development more specifically fits Kearney's explanation, which describes transnationalism as relationships between actors both within and transcendent of the state (Kearney 1995). I would add that within the Bolivian context the state-actor relationship is not distinctly categorized as between regulator and regulated, respectively, but instead a nuanced, mutually-constituted relationship between multiple stakeholder groups. For instance, the NGOs working in WatSan in the country design and delimit their work within both the state system of Bolivia and the national framework of the United States. USAID (a GO) is also in the mix, and is a complicated representative of the U.S.' aims politically and economically. While U.S. government funds are funneled through USAID to (often U.S.-based) NGOs, and while NGOs have a degree of autonomy with that money, both Bolivian and U.S. mandates dictate the ways in which they spend that money. Therefore, these NGOs have competing theoretical and practical aims.

Still, I argue that NGOs in this "space between" work with much more agency than directive. In the case of my research stakeholder groups, USAID and the U.S. are funders rather than managing partners for ACIDI/VOCA. While broad-based choices about where and what to fund trickle down, the choices about how to handle addressing these goals lay with the NGO.

I furthermore argue, through the findings of my research, that not only the aims of the NGOs themselves, but also the broader WatSan perspectives of the individuals working for those NGOs, are transnationally constructed. This means that the ways in which individual development practitioners perceive and explain their work are constructed from state, non-state,

and international constructions of human rights, “common sense,” and the development needs of Bolivia as perceived by the individual practitioner. This is interesting in two main ways—the first that development practitioners (hereafter DPs) work toward similar goals within WatSan for (at times) dissimilar reasons from their employers, and the second is that their personal experience melds with and yet differs from patchwork-constructions of “best practices” at the agency and transnational levels. This means two things within an ethnographic context—the first is that individual DP respondents are able to recommend organic “fixes” to a larger development system, and the second is that they can offer deep and meaningful recommendations and perspectives on how to handle culture, work, and policy in the Bolivian context that is both attendant to and yet not fully constrained by agency leanings.

### **NGOs and Neoliberalism**

NGOs, through the acceptance of external government funding and their place in development, have become complex arms of neoliberalism, eschewing government responsibility in funded nations and creating new systems of WatSan governance. U.S.-based NGOs and governmental organizations are shunned by the Bolivian administration for this relationship to neoliberal logics. Evo Morales, the president of Bolivia, is quoted as saying that the problem with USAID-funded development “is that there is no control” and that the work is corrupt (noting that 70-80% of funds go to overhead and payment for their workers (Gustafson and Fabricant 2011:28). At times, Morales and the Bolivian government have even discounted their own citizens’ indigenous voices “on the grounds that they are manipulated by NGOs” (Canessa 2012b:22). However, NGOs hold great power in water and sanitation development and programming (Whiteford and Whiteford 2005:261), and they have been working heavily within the WatSan structure in Bolivia, despite various setbacks. International organizations are described as guarantors of rights, along with states, in Bolivia’s endeavor to make WatSan a human right. The Bolivian ambassador’s speech to the UN (2009) championed this relationship.



NGOs are also explicitly part of the final WatSan rights amendment in the UN, which Bolivia ratified. NGO-based WatSan development holds a bifurcated position in Bolivian politics, providing at once an answer to a need and a model for social organizing, but also attendant transnational and neoliberal ideologies. The two-tone nature of Bolivia's relationships with NGOs is dissonant and self-contradictory, and yet it makes perfect sense in context.

Global, state, and local forces all converge in the WatSan development process. Global understandings as to acceptable water potability, access, and the right to WatSan collide with states' ability to provide these provisions, and local communities' lifeways. Water and sanitation as it has been implemented in Bolivia (using complex technologies and treatment systems) is a symbolic exchange of westernized water-management and another set of relationships from the transnational arenas related to rights. The idea of human rights is something that has been propagated in the international arena, adopted within Bolivia, and that (arguably) occurs organically from within communities. Responsibility for implementing WatSan projects and their upkeep can span all three of these elements, complicating not only the building and provision of these resources, but also their longevity. That being said, individual development practitioners, employees of larger NGOs, are the ones who actually interact with local communities and who connect the positions of the organizations with the positions of locals.

### **Study Population**

USAID and ACDI/VOCA, both focus agencies within this dissertation, each have offices in La Paz. The sample for this section of my study (n=11) consisted of both U.S. and Bolivian Nationals, and included individuals who had worked in development in Bolivia and either worked for one of the agencies or had worked on the WatSan system in Sapecho<sup>73</sup>. Respondents who were current or past employees of either of the organizations or of allied development groups

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<sup>73</sup> Please note that the DPs were able to choose which language they wished to respond in, English or Spanish. Most DPs were bilingual, so please note that the language with which they responded during the interview cannot identify their nationalities.

that worked in Sapecho were sought. I completed semi-structured interviews (from .5 to 1.5 hours in length) with each participant.

As the community of WatSan development professionals within the country is small, I leave some of the demographics in this section intentionally vague. As relationships between the U.S., USAID, and Bolivia, and between Bolivia and US development writ more broadly, have disintegrated since the end of my study (resulting in the expulsion of USAID and the dismantling of ACDI/VOCA's offices in the region due to funding cuts), I have taken extra care to ensure that the confidentiality of the respondents is respected, including pseudonyms and obscuring each individual's agency affiliation.

Every effort was made to ensure that I spoke to individuals from a variety of backgrounds, ages, and genders, but in the end the population for this part of the study was purposive at the core, including those who could speak to agency relationships, WatSan, and/or the community of Sapecho. This meant two things: the first was a gender bias, with only three of the eleven being women. It also meant that the sample included Bolivian and American participants. I will also note that I met with many of the respondents on their lunch breaks or at coffee shops—and all respondents are speaking from their own experience (i.e., relating to their own opinions) and are not representing the U.S. government or their agencies. By speaking to individuals in this way, respondents were more willing to relate the necessary aspects of this study—that is, to speak to the politics involved in WatSan projects, potential issues with WatSan development, concerns and recommendations for the process, and potential mistakes or missteps. They were also more willing to critique models placed by agencies (e.g. water committees) and provide their own fixes to these issues. I will further note that these responses were given during an interesting time in the development environment in Bolivia—most individuals I spoke to knew their jobs were in jeopardy, that their programs were shutting down, and that their work in the communities may cease. This gave an interesting sense of situational

irony to the whole process. I think, really, that reflection had already begun for the respondents—some were already counting the things that had gone well, wondering why some things didn't, and crafting their arguments for the benefit and need of development in the area. Whether this increased or decreased the candidness of their responses varied, I think, by person, but it certainly was an apropos time for the research.

Overall, the DPs I spoke to (as well as the individuals from the communities, as I will show in later chapters) were positive about the process of WatSan development. That is not to say they had no critiques, problems, suggestions, or comments on the process (quite the contrary)—but most did think that the WatSan projects produced a beneficial product, that the impacts were positive, and that WatSan development, specifically, should continue. There seemed to be an overall perspective that WatSan as a focus for development was a bit special. There was a perception that WatSan development brought the community together, and was overall a more positive experience, than some other development<sup>74</sup>.

## **USAID and ACDI/VOCA**

At the time of the research, USAID and ACDI/VOCA were working within several communities in the area, but USAID's exit, and ACDI/VOCA's dissolution in the area, was imminent. When I landed in Bolivia ACDI/VOCA was starting to clear out their offices in the region, and by the time I left the country there was a skeleton crew of 4 aid workers remaining to close up loose ends on projects. Both of the agencies' exits from the country were decidedly political, with the current government working against US-based agencies and development projects.

### **USAID**

As per USAID's website, over the entire course of its relationship with Bolivia, USAID

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<sup>74</sup> Individuals in the agencies I spoke to recounted failed projects that focused on coffee, poultry, and other foci—and presented several barriers to development in Bolivia.

spent “nearly \$2 billion” on combined projects, with the latest budget for fiscal year 2011 set at \$26.7 million U.S. While anthropologists and critical development specialists may critique and problematize the efficacy of USAID, especially in coca-growing regions (e.g. Conzelman 2006, 2007, 2008, Farthing and Kohl 2005) the agency clearly stated that the expulsion would end in the termination of programs which increased access to healthcare, environmental conservation, and other projects to “promote growth and livelihoods” (USAID Website). It has been widely understood, though, that besides imparting a net gain in local development, USAID “aimed at shaping Bolivian policies and had the resources to do so” (Tejerina et al. 2012). Thus, WatSan is a complicated issue within USAID’s position. WatSan provision was a clear way that they shaped policy and programming in the country, but it also provided benefit to local communities.

### **ACDI/VOCA**

ACDI/VOCA worked in Bolivia for close to 40 years. The projects implemented over the last 12 years of its relationship with the country, of which the WatSan system in Sapecho was a part, were supported by efforts by the U.S. government through USAID to diversify and reduce the tendency for coca production. The budgets for the three main ACDI/VOCA projects over the last 12 years were upwards of 70 million dollars, and were focused on both social and economic development. Projects included crop diversification (with specific focus on stevia, cacao, and coffee), water, sanitation, basic services, community infrastructure (such as bridges, squares, football fields, markets, hospitals etc.) and health. Water and sanitation has been a clear focus for the organization, as lack of access to drinking water, substandard sanitation practices, and concerns about water use and sustainability had been raised in the area. ACDI/VOCA has been working in the Yungas region since 2001, focusing mainly on integrated development, and prior to that, alternative development. Water and sanitation projects were always a very important area of focus for the region since the inception of their relationship (Vargas-Carlos 2008:1).

## **Development Practice and Emergent Themes in Development Practice**

The remainder of this chapter marries historical relationships between GOs and NGOs in the region and opinion and perspective on the part of the DPs. It also showcases the ways in which DPs both enforce and personally analyze agency goals. The DPs shed light on agency processes and relationships, including how the agencies chose project locations, to what extent human rights drove agency decisions, gender policy, and expectations of local involvement and expertise. Issues related to coca non-proliferation emerged as well, with practitioners providing both a window into the ways that coca shapes policies and the ways that coca growing impacts local livelihoods (especially in relation to WatSan projects). This chapter ensures that DPs' goals and expectations are presented, providing context and scale to the development process. These voices facilitate praxis as well, showing that DPs not only work within, but also exhibit agency and resistance against, the policies in place during WatSan development.

### **Choosing WatSan Project Locations in Bolivia**

Choosing development project locations was a complicated balancing act between the Bolivian government, addressing the needs of the U.S.-based funding agency and U.S. government's approach to coca non-proliferation and attention to community needs and self-determination.

#### **National Government/GO Relations**

Even before site selection began there had to be an understanding on the part of USAID that the potentially funded region was either growing—or was in danger of eventually growing—coca. Individual project locations were selected by the Vice-Ministry of Coca (which focuses in on certain municipalities each year). Projects were implemented by USAID-funded agencies,

and these agencies ensured community support and community buy-in to the project (any project deemed appropriate for the area by these actors, of which WatSan was common)<sup>75</sup>.

However, the exact line of authority within these development choices was conceptually and practically jagged. Jorge, one DP, did paint the relationship between development actors collaboratively, and explained that project choices were made between the three actors (the Vice Ministry of Coca, USAID, and ACDI/VOCA). Other DPs, however, alluded to more hierarchical relationships. One representative noted that USAID certainly did not act autonomously within Bolivia—but instead makes decisions contingently on government support. As Michelle states:

*The government [of Bolivia] has its own development plans, and how it sees its country developing and what it wants to do throughout the country. So, USAID has to work with the government to see what their priorities are, geographically and sectorally. And then [USAID] comes together and agrees where [they] may work, where it is possible to work, and then based on [their] budget levels, then [they] are able to design a project to meet those needs.*

Maria, on the other hand, saw USAID's dictates as key to development choices, and pointed out that coca-growing was a clear component in site choices:

*Well, USAID was working in this area with communities that, that agreed not to grow coca— that was the first agreement that USAID and the communities have. If you agree not to grow coca we can talk about making a bridge or a school, or a waste water system, according to what the community needs.*

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<sup>75</sup> The projects chosen in this fashion actually did not have to be WatSan-related, but could be whatever the community chose.

Compounding the tensions and power imbalances within this relationship between USAID and the Bolivian government was the fact that the Bolivian government under Evo Morales was at odds with U.S.-based programs and policies more broadly. As one DP, Michelle, stated:

*The government of Bolivia is not always the biggest fan of the United States, and so, [their] working relationships are strained. [They] don't have the bilateral relationship that many other countries do with USAID and other donors.*

The disjuncture in power between USAID and the Bolivian government was problematic and is tied to pressures between state actors as well as a wider proliferation of neoliberal pressures in the country (see chapter 2 for background). Still, while the power relationship between USAID and the Bolivian government was complex and contentious (as is evidenced by their current expulsion from the region) the relationship between USAID and ACDI/VOCA was certainly hierarchical, and this influenced the projects chosen as well as the choice of locations in which projects were placed.

### **Inter-Agency Relations**

Once a WatSan project location was chosen, the relationship between USAID and ACDI/VOCA was that of funder and implementing agency, respectively. While the label of USAID is extremely visible in WatSan projects (see figure 3, also noted in Goodale 2009), their actual relationship with funded communities was seen as superficial and, at times, disconnected from on-the ground development experience.

One DP, Federico, described the relationship between ACDI/VOCA and USAID as this:

*[ACDI/VOCA's] relation [with USAID] is as a donor. USAID is the donor, the financial collaborator, and [ACDI/VOCA] are the implementers. My work, mostly, my principal work, is to make sure that I make sure to care for USAID, that I implement the projects well. I have to guarantee that the funds from the North Americans are well utilized.”<sup>1</sup>*



Figure 3: WatSan Project Labeling  
Sapecho, Bolivia 2012  
Photo by Maryann Cairns

Federico goes on to say that he does feel that the relationship is collaborative, but also sees some space within which funders and designers of projects do not adequately account for culture within their work:

*“Okay, so the international cooperation in Bolivia is definitely very collaborative, but it could be better. What happens is that many times, they plan programs which are designed outside of Bolivia, from people’s visions who aren’t related at all to the life, or the culture, or many aspects that are necessary to consider at the time that you create or implement policies and interventions in other countries.”<sup>2</sup>*

This disconnect is chronicled in other studies which critique development’s lack of cultural awareness and specificity in programming, especially when it comes to WatSan and environmental thinking (Allen 2006a, Hailu et al. 212, Laurie and Crespo 2007). Scholars point to multi-stakeholder environments as relationships that cause decision making to be “highly



political and often driven by a narrow interpretation of the costs and benefits” (Thabrew 2009:68).

### **Inserting Community Choices**

The community itself did have some self-determination as far as what type of project should be implemented, if not the ability to lobby for funds directly. In the case of Sapecho, the water project was chosen by community representatives, ostensibly with the permission of the population as a whole. As one of the DPs, Ray, stated:

*In Sapecho, they went through a whole process where they decide what kind of project they would want to have, and so they chose the water project. They prioritized the water project and the wastewater treatment system [over other projects].*

Thus, while the choice of the community is contingent on the relationship between the three main actors, USAID, ACDI/VOCA, and the Viceministry of Coca, the community has an integral role in choosing the project. That is not to say, however, that the expertise related to the project was indigenous, nor that the community was not coached by the aid organization to ensure that they fully understood the import of their decision. Frankly, attention to local agency was partial. This kind of mediated relationship with communities, wherein they are both able to make decisions and yet constrained in the process, is reflected in other studies from Bolivia as a whole (Farthing and Kohl 2010, Hailu et al. 2012, Komvies 1999) especially those in drug-producing areas (e.g. Kohl and Farthing 2005). As Gerard, another DP, stated:

*There is a process and [the aid organization] basically made them change their priorities using facts, using numbers, to make them think twice on the priorities that came out [of their plan for development]. So in most cases, [the aid organization] focuses [the community].*

This direction was clearly meant to ensure that the community was fully sure of their choice of development project and designed with good intentions. Another DP, Federico, stated it this way:

*If we worked with the community a little, I think we could change the path [of the project]. We would indicate the health of the people [as a priority] because a government house, or a building, wouldn't help at all with health...it doesn't help if we don't have health first in the home.*

The question here becomes whether or not it is beneficial for the community to have directed input from the aid agency during the choice of a specific community project. Is it the place of the aid agency to prioritize specific development choices over others? Or should the unfettered choice of the community be paramount?

Studies have interrogated the ways in which infrastructure choices and infrastructure expectations become ingrained in existing contexts, and have argued that while a particular approach may not be most reasonable, if it is often seen or implemented it is likely to be continuously applied. In the case of WatSan, centralized sewage removal systems are often the norm, and lower-cost, more individualized approaches are often overlooked. The favoring of common technologies is referred to as an infrastructural regime (Mondstadt 2009: 1930). Shifting these regimes to more favorable, sustainable, or appropriate designs is difficult. NGOs in Bolivia, while at times able to innovate, often rely on the status quo for infrastructure design. While this lends itself to a larger knowledgeable base of engineers in the host country, at the community level it may do more harm than good. If implementing certain systems requires specialized knowledge, then perhaps more appropriate infrastructure could be devised.

Before engaging a discussion about the right to WatSan, I want to delve into the issue of coca and coca production, which was both a factor in the choice of location for WatSan

initiatives and related to the overall perception of development effectiveness on the part of DPs. This complicated crop was clearly implicated as a player in the WatSan process, and its position must be understood to engage WatSan development in Bolivia.

### **Coca: Influence and Blowback from a Complicated Crop**

Eight of the eleven DPs I interviewed spoke unbidden about Coca — most at some length and more than once during the span of our conversations. Coca is and has been a hot-button issue for development in Bolivia. As discussed in the background chapter of this work (chapter 2), the U.S. has been interested in limiting the expansion of coca production since the early 1900s, and the entire alternative development program was aimed at ensuring that individuals had “alternatives” to coca production. Still, even the DPs who spoke to me most candidly about coca did so in a rather hushed manner. The issue of coca is so hot-button, so confusing, and so contentious in Bolivia that discussing it was both necessary and unpleasant. As Matthew, a development professional, summed up—“in Yungas you have the coca production, which is always an issue.”

While coca is legally grown in Bolivia in the “traditional zone” including Coroico, Chullumani, Coripata, Yanacachi, and Irupana, and now La Asunta, coca production in surrounding areas is common. Furthermore, since Evo Morales took office as the president of Bolivia, coca is no longer very forcefully regulated by law, although production outside of the Yungas and Chapare<sup>76</sup> is discouraged and production within those regions widely encouraged by the government (Farthing and Kohl 2010).

Ronaldo summed up the relationship between his agency and coca as this:

*We work together with USAID, USAID Works with the eradication of coca, or at least allegedly for coca eradication. So we start projects in specific places that USAID says,*

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<sup>76</sup> Where coca growing is also legal.

*in agreement with the [Bolivian] government, together with the Vice-Ministry of coca, and they say—in this sector they have a lot of coca, and we don't want them to have as much coca, and so we'll cut it, get rid of the coca plants, and in place of this we'll give you some projects, yeah?*<sup>3</sup>

The problem is that even people who have received projects don't really get rid of coca, and even those who do get rid of coca don't always see projects that turn out very well.

Development professionals surveyed in the study saw coca production as inevitable but also very problematic. Coca-growing regions, just in the responses of the Bolivian-born development professionals, were characterized as communities of people who were more in-line with “machista” culture, less concerned with family, less likely to give money or days of work for water and sanitation development, less concerned about community, more transitory, less likely to respect the rights of others, and home to creators of insecurity. With the addition of the viewpoints of professionals born outside of Bolivia, there were the added negative characterizations of coca-growing regions as being home to disintegrated families, environmental predators, and individuals with fewer traditional values. No positive traits for these communities were shared, but the DPs did note that people in these areas made a lot of money, and that the money was very attractive to many Bolivian farmers.

Adding further complexity to this issue, some DPs were very concerned with coca's effect on the land and water resources of the country. Federico argues that the issue of coca stems into conservation initiatives and the rights of Mother Nature. He argues that Bolivia has a “double discourse” related to coca and care for Mother Earth:

*[The government of Bolivia] gave rights to Mother Earth, but elsewhere in the constitution declared the coca leaf as the main product of Bolivia. Coca degenerates the soil and in a few years makes the land unfit for cultivation. So, this production [of coca]*

*is good for the economy of the campesinos, but the results are terrible. On the one hand, it generates a dangerous economy—drug trafficking. The Young people fall into this evil, drug use, drug sales, they end up in prison, sick, that's the one hand. On the other hand we're leaving mother earth without land. So really, these things aren't related, we talk but do nothing [to protect the rights of Mother Earth].<sup>4</sup>*

DPs were truly concerned about the way the coca trade was impacting society and had sincere concerns for locals and the environment as well. They understood, however, that these views were at odds with the current government.

What was striking about the DPs' characterizations of coca was that they were so negative. Anthropologists interested in coca growing provide a flip side to these views presented by DPs, arguing that coca has many benefits (both culturally and physically) to the Bolivian people and that efforts to stop production have been a net negative rather than a net positive (Allen 2012, Conzelman 2008, 2007, 2006, Conzelman et al. 2008, Farthing and Kohl 2010), and it was these perspectives that I carried to the field. These scholars argue that programs to stop coca growing have had problematic outcomes. These negative outcomes, along with the U.S.' "systematic and persistent harassment and repression of coca-growing families" has been difficult to reconcile within the alternative development program (2008:204-205). Sapecho residents had rather positive relationships with alternative development born from coca non-proliferation initiatives, but the programs in the Yungas were seen as more intimately tied to the local municipalities and done with more of a collaborative aim than those in the Chapare (Conzelman et al. 2008). Frankly, Bolivians have varying perspectives on coca growing, and while anthropologists have championed the positives of coca as a traditional crop, the more negative perspectives of the DPs may hold water and at least are born from their own experience.

It is not within the scope of my dissertation to decide whether or not coca is beneficial, or to really discuss any opinion on the part of the choices made by development agencies to make so many programs contingent on coca non-proliferation. Instead, my point here has been to outline the ways in which development professionals involved in WatSan projects perceive the influence of coca in WatSan development issues. The two main themes in this are, first that development professionals perceived coca-growing regions to have a higher incidence of social problems than non-growing regions, and second, that professionals saw specific issues with both environmental degradation and social deterioration in coca-growing regions. Within this discussion, they alluded to a certain amount of hypocrisy on the part of the government, which had bifurcated views on coca growing, environmental stewardship, and development aims. These perspectives add further nuance to the fact that coca is so integral to the choice of development locations and WatSan development recipients.

### **Implementing the “right” to WatSan?**

A special rapporteur on the human right to safe drinking water and sanitation was hired by the UN in order to interrogate issues of WatSan worldwide from a human rights perspective. The introduction to the right to WatSan on the UN Website argues that “having access to safe drinking water and sanitation is central to living a life in dignity and upholding human rights, yet billions of people still do not enjoy these fundamental rights.” The UN addresses that these rights, and access to these rights, are difficult to ensure. Again, from the introduction:

*The rights to water and sanitation require that these are available, accessible, safe, acceptable, and affordable for all without discrimination. These elements are clearly interrelated. While access to water may be guaranteed in theory, in reality, if it is too expensive, people will not have access. Women will not use sanitation facilities which are not maintained or are not sex segregated. Having a tap which delivers unsafe water*

*does not improve one's access. Human rights demand a holistic understanding of access to water and sanitation.*

What constitutes availability, accessibility, safety, acceptability, and affordability is concerning and nebulous in practice, and my study shows that the best laid intentions to ensure this through infrastructure may end in less than perfect on-the-ground implementation (see chapters 5-7). The focus of this chapter is to interrogate the relationship between individual development agencies and the wider call to ensure rights to WatSan. Are USAID and ACDI/VOCA working to implement WatSan as part of a wider human rights focus, or is their action more complex or constrained than that?

### **DP Perspectives on WatSan Rights**

DPs responded directly to my main concerns related to WatSan rights: 1) Do aid agencies work from a specifically rights-based approach? (i.e., is the implementation of WatSan projects due to an attempt to ensure WatSan rights?), and 2) Are WatSan rights actionable or do on-the-ground concerns constrain their provision?

### **DP Perspectives on Rights Engagement**

When asked directly if a human rights framework was used by the organization, respondents often answered somewhat like Gerard, noting that while the organization was focused on implementing WatSan, it was not necessarily focused on implementing these projects because of human rights.

*Maryann: Are your projects based on the idea of human rights?*

*Gerard: It is not something we have...it is basically more on the structure of the institution.*

*Maryann: So when you put in a project, do you feel that you are helping to ensure rights, or no?*

Gerard: *No, we don't have that vision. I mean, we know that it [WatSan] is a human right right now, and that we should know that for the Bolivian government and should be behind it from that perspective...but it is not like okay, water and sanitation—water is a human right—and we have to ensure it. Like that, no.*

Ronaldo argued that the projects' focus areas were more based in Bolivian government regulations—"we have to base the projects in the Bolivian law," he said. DPs usually could see a link between their projects and meeting the right to access clean water, but saw themselves less involved with ensuring rights than just doing their actual work. As Ray noted, "I think, if you look at the kinds of projects we did, they're all based on the right to have access to clean water...but I was more involved with the engineering part of it, so I didn't focus on that as much." Most individuals that I spoke to as part of my sample did not feel that they were instructed to specifically consider human rights on a day-to-day basis, but agreed that there was an overarching understanding that WatSan development was for human rights.

Still, many practitioners personally felt a connection to human rights frameworks and ideas and could speak to the concept of rights at a variety of levels. For most, rights understandings were influenced by the UN, the laws of Bolivia, personal ideals, and practical expectations for WatSan projects. Rights, for the development professionals, were constructed at a personal level based on a transnational understanding propagated and defined by a variety of actors (not unlike rights understandings for community members in Sapecho). To some, the right to WatSan was based on Western ideals of rights at the individual level. To others, the right to WatSan was just common sense. For still others, it was enshrined in the laws of Bolivia. Regardless, all were technically involved in granting access to these rights--but frankly, all involved were more focused on work than theory.

### **DP Perspectives on WatSan Rights Application through Infrastructure**

DP respondents related one central tension with the WatSan as a human right



framework. This tension lay, conceptually, between access to water (the resource) and access to WatSan infrastructure (the project). The dichotomy brought up concerns related to cost, community involvement, and long-term sustainability. These concerns matched larger discussions of the “right” to WatSan at the global level, wherein costs, infrastructure, and social involvement collide, making WatSan rights difficult (Abdel-Gawad 2007, Allen 2006, Arnad 2007, Gleick 1998). More focused on Bolivia, DPs explained that indigenous ideas about mother earth and the use of natural resources, at the country level and as engaged by the Bolivian government, led some nationals (DPs and community members alike) to believe that the right to WatSan should translate to free (i.e., no cost) access, whereas in opposition, the wider framework of the Human Right to WatSan propogated by the UN argues that access should be affordable (UN Website). As one development professional, Sam, summed up:

*Oh, I feel like everybody has the right to access water, but that doesn't mean that the water service should be free...I think the Bolivian government thinks that it should be free. That has caused a lot of problems, because unfortunately, for the one they have limited resources no matter what, and ultimately because of ownership. Someone always owns the source of water, and the infrastructure is not cheap, nor is it permanent. I mean, when you build a water system it is very expensive. Its maintenance and operation is expensive. It needs to be replaced in twenty to forty years. It basically cannot guarantee that you can have continued service. The problem is it isn't going to work for free, and they are not going to clean the tanks for free. You know, ultimately, the service is different than the water, so I guess in that sense—I think the other donors have a pretty similar sense of what I'm saying—is that we don't feel like the service is free because we know what it costs to have the service.”*

As reported by another respondent, Allison:

*What we are trying to provide is not water, the water already existed, we are trying to—we are going to—provide a system that is going to provide water—and some specific conditions, with quality, that is the water won't be contaminated, and quantity, quantity enough for the whole population. That means you are going to have water year-round, with capacity to provide that water.*

DPs very much believed that improved access to WatSan came at a cost. But this, for them, was in line with the idea of human rights, not against it. Issues of longevity, water quality, and water quantity were brought up and stressed by DPs. Just as Allison noted, the water already existed—it is infrastructure which needs to be afforded to communities. This intrinsically requires both money and technical expertise, and for DPs in the study this cost was part of ensuring rights, not part of restricting them. Again, though, they also saw a distinction between their agencies' actions and true human rights approaches. Thus, they could address WatSan development from a different sphere of reference than WatSan rights.

### **DPs and NGOs as Guarantors of the Right to WatSan**

Regardless of their perspectives or the perspectives of their respective NGOs, it has become the place of NGOs to guarantee the right to WatSan in rural Bolivia. It has become the realm of NGOs, grassroots organizations to uphold and enforce human rights in the neoliberal era—but who is analyzing and updating the theory of human rights based on this practice? The issue of responsibility, both in terms of practice and in terms of theory-generating, is one of the greatest issues we face. Are NGOs and their employees redrawing and re-imagining rights to WatSan in beneficial or detrimental ways? The ethical implications of actual practice in these realms are further problematic. As Gardner and Lewis state “ultimately, for the quality of people's lives in poorer countries to improve, global conditions must change” (2005:358). Are NGOs and other non-governmental bodies capable of changing this larger global system and

ensuring rights if their own perspectives and policies related to rights are unclear to their own practitioners?

Of course, the process of implementing WatSan projects, regardless of whether or not they are based on a human rights approach, has imparted certain perspectives and policies, also championed by the aid agency. Gender policies were a specific area of concern for DPs, and issues with gendered policies as raised by these respondents is discussed in the next section.

### **Gender Critiqued**

Tina Wallace and Anne Coles argue that “gender is often equated with ‘women’ in the water sector,” and I think this is a fair overall assessment from the research that I have conducted as well (2005:8). Development professionals at ACDI/VOCA and USAID were very concerned with gender, and this translated broadly to the inclusion of women in development projects rather than exploring the situated position of both women and men. DPs were also more interested in integrating women in the process of development than they were with exactly how changes to the WatSan landscape would impact gender as a whole.

To an extent, the false assumption that water decisions are “gender neutral, that the population is a homogenous whole, and that benefits reach everyone equally” still stands in the DPs’ expectations for WatSan impact, even though that idea is increasingly challenged in academic literature (Laurie 2011: 173 on Davila-Poblete and Nieves Rico 2005, Davila-Poblete and Nieves Rico 2005). The DPs in my study adhered to the policies surrounding gender as a way to empower women. This was clearly related to USAID’s gender policy, which was one of the most visible components of monitoring and evaluation for ACDI/VOCA personnel. From USAID’s Gender Equality Policy:

*Gender equality and female empowerment are essential for achieving our development goals. Unless both women and men are able to attain their social, economic and political aspirations, and contribute to and shape decisions about the future, the global community will not successfully promote peace and prosperity. Realizing this policy in all of the countries in which we work will enable USAID to be a catalytic force for gender equality and women's empowerment worldwide and bring to fruition the vision of a world in which all people are equally empowered to secure better lives for themselves, their families, and their communities. [USAID Gender Equality Policy :20].*

Including women in WatSan was a clear goal of the development professionals. They usually gauged women's participation by their presence at WatSan meetings, in infrastructure development, and their representation on the water committee. I don't necessarily debate that women's inclusion is good as a concept, however I do problematize the ways in which it impacted women on the ground, and argue that the fact that the "gender equality" portion of USAID's policy was a clear second to "female empowerment" was problematic. For the DPs, though, ensuring women's participation is actionable and measurable—trainers knew to include women in meetings, include women in construction, and include women in management. The concept of "gender equality" was unclear and difficult to attain in comparison. While DPs were not actually enforcing gender equality, though, their experience with implementing female empowerment initiatives gives us a good window into potential concerns for ensuring gender equality.

### **DPs' Situated Knowledge of the Blowback from Gender Policy**

Even if the ways in which DPs put gendered policies into practice was partial and a bit lopsided, DPs were able to shed light on the culture of gender in the process of WatSan development anecdotally, and this gave me a nuanced view of the ways that the gender inclusion policies actually played out in practice.

A disconnect between policy and practice in the area of gendered policies is widely noted in the work of water researchers (Ahlers 2005, Bennett 2008, Brikke 200, Flynn-Dapaah 2010, Harris 2009, Wills 2012), however the position of women in WatSan infrastructure upkeep roles, especially in maintenance of sewage collection and wastewater treatment, is a newer area of investigation in anthropology (Alley 2004). From the development side, it is understood that “interventions designed to engage with problems of scale and diversity over the long term frequently require first and foremost a new political and organizational culture on the part of water and sanitation authorities, local politicians, and users” (Allen 2006b:78). DPs who took part in my study detailed some of the ways in which women and men act differently within WatSan infrastructure maintenance and management requirements, and the ways that they responded to diversity overhaul through new development policies. As Ray states:

*There’s usually more men in certain roles, especially engineering and maintenance of the water systems. It’s always been men, but there’s also always some women in the water committee usually. But in my experience, women don’t play as big a role as men in the water committee. But at the same time, when it comes to working, doing the work for the system, women aren’t involved in that.*

Edgar noted that in the management bodies for WatSan (for further explanation of structure see chapter 6) the “women are the secretaries, but the directors, everyone that is making the decisions, the politicians, the mayors—purely, purely men.” Matthew notes that two or three women represented on the board is a “pretty good balance.” To this I ask: Is this true? Or is it too few (or too many)? Involving women ensures that they have a space within which to participate in WatSan decisions and a space within which to voice their opinions on WatSan management. As women are often the ones most intimately involved in water use in the home, this is important (Clever 1995, Coles and Wallace 2005). However, forced involvement in

WatSan can cause issues with women's workloads, their family lives, and their positions within the community. In effect, the participation and voice is not guaranteed just because they are present in the WatSan process. As Briane Willis (2012) states, "development of a water source has the potential to negatively affect the livelihoods of women." Several DPs in my study stressed the difficult position of the women in the area as part and parcel to the difficulty of placing the onus of development of WatSan, or the management of WatSan, on women.

As Maria states:

*They [the community] elected women to handle the money, because they say they are more responsible, they are more honest, and they usually have the role of managers at their home, so it was interesting—sometimes women don't feel confident enough to have this role.*

Jorge, too, had a critique. He said that women wanted to be part of the projects, but that:

*For them [women] it is more work, it is that they work in the fields, the women are the ones who wake up earlier and go to bed after the rest. And what's more is that they are the ones who care for the children, and some, not all, help in the fields with the men. And so giving them this work of management or this type of job, and for her it is increasing her responsibilities.<sup>5</sup>*

Here, we see women's work requirements jutting up against an expectation of women's participation—and we also see that development professionals see tensions with that. The work itself is both an impetus for, and a reason against, including women as integral parts of WatSan management and development. Adding more work for the woman both empowers and disempowers. Championing female empowerment over true gender equality and culturally-relevant gender understanding is truly problematic.

### **Encouraging NGO-based Focus on Men**

None of the DPs problematized men's position within WatSan or spoke to the tensions between genders specifically, although their responses hinted at the possibility that gender policies weren't going so well in Sapecho for either men or women (a point explored further in chapter 6). This fits with what Nina Laurie argues; that "more than two decades of mainstreaming gender into development research and policy have failed to come to grips with the masculine subject" (2005:527). Chant and Gutmann argue, too, that one major consequence of excluding men from GAD [gender and development] projects is that this can give rise to the emergence or aggravation of hostilities between men and women at the grassroots." WatSan development has certainly not excluded men from the process of WatSan, but their focus on women's' empowerment has created an interesting set of agent-based resistance on behalf of men in the community of Sapecho (see chapter 6). Certainly, if women's participation is not encouraged and enforced, then women may be left out altogether, but if women's participation is ratcheted to the top of the development paradigm without attention to their lived experience and the lived experience of the men in their lives, there is no promise that female empowerment programs will work, or will actually benefit women.

Regardless of the gender of the participant in the WatSan process, though, DPs had pre-ingrained perspectives on local abilities and local knowledge bases that affected their implementation of development programs.

### **DPs' Concerns about Local Ability for System Operation**

DPs had certain concerns about locals' abilities to care for and manage the complex WatSan system. Although community members were involved in the choice of the WatSan design, rarely were any of the locals engineers, let alone engineers with a specialization in water and sanitation systems. Ensuring that system operators first knew enough to take care of

the system, and then ensuring that they stayed around long enough to keep the system working in the long-term, was difficult for a variety of reasons.

ACDI/VOCA trains only about five people to be true operators of the WatSan system in areas where their projects are implemented. These individuals are given in-depth and valuable training, but they must agree to stay in the community for two years in order to participate in the program. The problem is that the operators, having gained this specialized knowledge, have competitive offers for jobs in other areas. They are attractive to employers that pay better for their work than the small communities where they were trained. These individuals have also gained an element of prestige and have worked side-by-side with development professionals, giving them a leg up on the competition. NGOs do expect that the training may eventually give someone the opportunity to seek a better life, but, they do expect retention of that operator at first. Unfortunately, people rarely stay for the full two-year commitment (see chapters 6 and 7). DPs depend on trained individuals, after that two years, to train others to work in their stead, making the program sustainable. Unfortunately, this doesn't happen organically, and rarely happens at all. DPs knew it, but they had little to no way to address this, as they were doing everything possible to train operators for their systems. Here we see a disconnect between policy and practice—the NGOs state categorically what the “rules” for the program are, but these rules are largely unenforceable. In order both to give this training and keep people around long enough to do the work they've been trained for, NGOs and communities will have to work to make the job of “operator” more workable in real life.

The trouble is that even if there is a fully-trained operator, they may still not be able to handle complex issues with the system that emerge in the long-term. For that they may need support (both financial and technical) from NGO partners or the government. Unfortunately, NGOs are unable to provide long-lasting support in either way. Ray notes the difference between minor problems that the committee/operator can solve, and complex problems that are



outside of the scope of what the committee/operator can handle. In Sapecho, there were examples of this type of problem that locals really just weren't equipped to handle. He states:

*There's two problems I know about. One of them is cleaning the sludge from the reactor which I've been working with them on...and the other is that in the rainy season, water leaks into the sewage system and it makes the flow go really high, which will shorten the retention time of the lagoons and the reactor.*

These problems were directly related to the sewage and wastewater treatment plant, and the specific expertise and cost that was part and parcel of managing it. This complexity of the wastewater treatment system continues to be a theme throughout this work (see chapters 5-7); I remind the reader that the DPs knew about these types of infrastructural problems and saw them as a clear limitation of the development process.

### **Addressing WatSan Process Relationships**

Making water a right makes water "everybody's business" (Lundqvist 2000:196). However, who gets to participate in this business, and who makes the real choices surrounding WatSan development in Bolivia, is tied to a complex, transnational web of infrastructure provision and coordination. It is safe to say that the power to choose what WatSan projects, when, and by whom, does not truly lie with communities, but is rather negotiated between third party governments, transnational organizations, and developing country governments. Still, that is not to say that individuals working within these levels are unable to see the points of disjuncture within that system, or that development professionals are completely deaf to the needs, wants, and positions of local communities.

Historical tensions between the Bolivian state and the U.S. mediate the development of WatSan projects on Bolivian soil. History here matters for the process of enviro-social change embedded in WatSan development, and historical relationships both spur (through the aim of

encouraging pro-US practices) and constrain (through Bolivian resistance to these aims) the process. Power is clearly related to this relationship, as both the government of Bolivia and the U.S. wield their varying power structures in different ways. One of the clearest elements of power for the U.S. is funding availability, and another is technical expertise. For the Bolivian government, sovereignty is exercised. Finally, because of these historical and power-laden relationships, some local communities are marginalized, and others are given an element of enviro-social power through access to improved water and sanitation infrastructure, a point I will develop in this dissertation.

The inclusion of development practitioners' voices in this work is designed to ensure two things. First, it is intended to show that a collaborative approach to critique of development can be achieved, and second, it is intended to give development professionals a clear space within that discussion. Of course the professionals themselves see avenues for improvement or change within their own work. While many studies look at development impact on the part of the community, I argue that this is often done while leaving development practitioners voiceless. There is a shared lived experience between the development professionals who participate in projects and community members where projects are placed, and that should be respected and interrogated. There are certainly shared critiques between DPs and community members, all of which could add to the critique of development practices. Interestingly enough, the DPs' concerns aligned with those raised by community members, and were even a bit prescient (e.g. they saw the potential for problems with upkeep even before the community did). The DPs' understandings of WatSan processes and tensions were accurate, and their critiques of NGO mandates, whether direct or implicit, were appropriate and mirrored by my experience within the Sapecho community and the perspectives of the community members. The individual agents of development have agency and perspectives of their own, and their voices highlight problems

within the WatSan structure as well as disjuncture between overall NGO paradigms for WatSan and culturally-specific expressions of these paradigms.

That being said, I think Melissa Draper has it right when she says that “whatever the [development] project—whether big or small and apparently free of political motivation—it inevitably brings unforeseen consequences to a community whose social structures are not fully understood by foreigners” (2008:224). And, many times, DPs are foreigners, or particularly wealthy or powerful members of a local country. ACDI/VOCA employed both Bolivian nationals and US nationals, and the mix was, I believe, useful. While certainly the chorus of these voices has raised some similar issues to those raised by the community, they in no way capture the full ethnographic picture of what is happening in the villages where their programs are placed. Furthermore, personal position, viewpoint, culture, and expectations of the DPs can at times be divergent from those in local communities. This can be useful, however, as these points of disconnect can show tangible ways in which WatSan policy can address issues which would help to further and improve development.

The following chapter (4) introduces the community of Sapecho, and sets the community’s place within the WatSan process both historically and socially. The chapter opens the door to marrying the perspectives of the DPs to the experiences and positions of those who are the recipients of development aid by ensuring that the reader understands the intricacies of space, place, and identity within the area.

### **A Project Description**

This project insert covers, in brief, three main components necessary to understand the logistics surrounding my study, which readers may need for reference and context. The first section provides a brief rundown of the Sapecho system’s implementation and installation

components. The second section discusses why Sapecho (and San Antonio)<sup>77</sup> were of interest for my research project and to the other students who took part in the NSF project that funded our work. During the discussion I also give a quick overview of the types of work that other scholars have done in the area as part of this 6-year grant, and delve into the approaches used by my peers in engineering and marine science.<sup>78</sup> The third section gives a critical overview of the ways in which the NSF grant participants may have influenced the WatSan system in Sapecho, especially as regards the long-term management, efficacy, and working technical nature of the infrastructure. I include this section because of the possible confounding effect on the social data I collected surrounding infrastructure management that the influence of the NSF students may have caused, and in the spirit of full transparency.

### **The Sapecho WatSan System**

The WatSan development project implemented by ACDI/VOCA (which is the focus of this study) was not the first water project in the area of Sapecho. The community has been the recipient of a variety of measures for water delivery, including one with Bolivian water and sanitation project (never finished, by all accounts), a project with COTESU, and a project with the Lutheran church in 1978 (Villarando 2009:1). None of these provided full coverage for the community or household-level access. These early endeavors were followed by a system implemented in 1993 by CARE. This project largely failed to be viable, mostly because of lack of administration of duties and maintenance, especially in areas outside of the main town of Sapecho. None of these earlier projects had any kind of sanitation or wastewater treatment component, and the benefits of these projects were inequitably distributed. Many households before the implementation of the ACDI/VOCA project still relied on the river water for many of their water needs.

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<sup>77</sup>San Antonio is a site within which scholars under the NSF grant studied, and where I completed part of my pilot research. San Antonio is not a focus of my dissertation research, as Sapecho was chosen for my site.

<sup>78</sup> I was the only anthropologist who completed dissertation research under this grant.

The ACDI/VOCA project in Sapecho was intended to equalize the impacts of the partial projects from the past, and to ensure that each of the eight communities hooked up to the water system had adequate running water. However, sewage collection and wastewater treatment was only afforded to those who resided in the town of Sapecho proper, as the area is more populous. Many of the smaller communities surrounding Sapecho are actually made up of properties owned by individuals who live in Sapecho. Sapecho residents walk to their plots each day to farm, and the water hookups at their properties are little more than a spigot. The complex infrastructure seen in Sapecho (sinks, showers, toilets, etc.) were less common in these other neighborhoods. The cost of connection as well as the cost of internal infrastructure make the up front monetary commitment for residents participating in WatSan projects very expensive (Cornejo 2013, Fuchs and Mihelcic 2011).

**System Description.** The WatSan system in Sapecho<sup>79</sup> has three main subsystems—fresh water delivery, sewage collection, and wastewater treatment. The fresh water delivery system reaches eight communities, all generally an extension of Sapecho proper. These communities are Villa Carmen, San Pedro, Panamericana, Sapecho proper, 24 de Septiembre, Brecha A, Buena Vista, and Tupiza. The water delivery system is gravity-fed and is sourced from four springs in the mountains (Figure 4). A gravity-fed water delivery system uses source reservoirs at an elevation higher than the end destination. This use of gravity eliminates the need to pump water between source and end-point. The high water source reservoirs are connected to the destinations, via conduit, often in the form of pipe, where users of the delivery system can access the water. The destination can be as simple as a public tap, or as complex as a community-wide distribution network including individual distribution lines to feed each household in that community. Gravity-fed systems “provide a significant portion of domestic

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<sup>79</sup> Sapecho is the wider region of the WatSan megaproject, and includes all 8 communities. This should not be confused with the town that, for the purposes of my research, I refer to as “Sapecho proper” which is one of the communities along the WatSan megaproject line.

water needs” to individuals in Alto Beni and the developing world as a whole (Fry et al. 2012:120). The efficacy of a water delivery system can be impacted significantly by the size of the water reserve (How many hours of reserved source water are available?), the quality of the source water, and the application of a water treatment process to the distributed water. For an excellent overview of gravity-fed systems in a developing country context (Honduras) see Simpson 2003, and for technical specifics see Jordan 1984, Mihelcic et al. 2009.



Figure 4: Commemorative Poster of WatSan Project at Sapecho

The sewage removal and wastewater treatment portions of the megaproject are only available in the town of Sapecho. The total cost of the wastewater treatment and sewer system in Sapecho was US\$321,655, with \$234,372 paid by the community (including the cost of in-home infrastructure) (Muga et al. 2009, Meredith et al. 2007). A centralized sewage collection system, connecting each of the households' toilets, sinks, and showers (installed at the time of the sewage collection system implementation), removes grey (shower and kitchen) and black (feces and urine) water from the household level and, through a gravity system, carries wastewater to the wastewater treatment plant.

The questions of who has access to these subsystems, who doesn't, and why, is a chief component of my study. Centralized wastewater treatment facilities have been widely studied outside of Bolivia, but within the country they have been "largely unevaluated" (Muga et al. 2009b:5801). Gravity-based sewage collection systems gather wastewater from multiple households using individual collection lines (pipes) which are typically connected to individual household-level wastewater infrastructure (e.g. toilets, sinks). Gravity causes the waste to travel freely through the pipes to lower elevation where the wastewater treatment system (hopefully) is installed. The costs for the sewers are considered "significant" by the Water Environment Research Foundation (Fact Sheet C1 Nd, for more information please see Crites and Tchobangolous 1998).

The wastewater treatment system in Sapecho consists of a system that funnels wastewater through a grit remover (to remove sand and grit that could harm USAB functioning (Fang 2010:66) into a USAB (upflow anaerobic sludge blanket) reactor (for more information see Fang 2010). A by-pass included of the reactor is available if necessary. Once the wastewater enters the USAB reactor, sludge (solid components of waste) are removed to two sludge drying beds. The liquid parts of that waste are routed to two maturation lagoons. Once that liquid waste is treated, the effluent (appropriately treated water) is piped by gravity to the river. The USAB-pond model is common in projects that serve centralized towns and has been adopted

widely for such projects in Bolivia and in other areas of Latin America (Verbyla et al. 2013). It has been proven an effective treatment option in South America (Hadley 2013 on Crites and Tchobanoglous 1998, Muga et al. 2009). The model is based on “three phase separator” model, which allows the reactor to “separate gas, water, and sludge mixtures under high turbulence conditions” (Iwaterwiki Website), and two maturation lagoons (large facultative ponds for the treatment of waste through aerobic (at the top) and anaerobic (at the bottom) digestion (for more information see Crites and Tchobangolous 1998, Hadley 2013, Oakley 2004, 2005, 2010, Verbyla et al. 2013). Put more simply, the USAB reactor is the first stage of treating wastewater (the grit remover precedes this, but only to catch grit (e.g., sand). The reactor separates gas, liquid, and solid portions of wastewater. In the reactor, biological processes break down this waste. Products of the breakdown are methane gas, which in the Sapecho reactor is released at this stage, and sludge (solids) which is released into the sludge drying beds. The release of these solids comes up later in this work, as this aspect of operation and maintenance was a large problem for the Sapecho system. The liquid portion of the waste continues into the lagoons. The lagoons, together, work to ensure that dissolved and particulate wastewater constituents, over a period of days, are processed by physical, chemical, and biological processes. Algae at the surface provide oxygen through photosynthesis, and then bacteria use this oxygen continue to break down waste. These ponds greatly reduce, when working correctly, the pathogen content of the liquid waste, including potential contaminants, viruses, bacteria, and parasites present due to the presence of human waste<sup>80</sup>. Finally, the system releases effluent (treated wastewater) from the lagoons into the river and waterscape.

**University of South Florida, Michigan Technological University, and Alto Beni.**

Researchers and students from University of South Florida (USF) and Michigan Technological University (MTU), along with students from *Unviersidad Tecnologica Boliviana*

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<sup>80</sup> These ponds also remove biochemical oxygen demand (BOD) and total suspended solids (TSS).



(*UTB*), have had a relationship with Alto Beni, and specifically with the communities of Sapecho and San Antonio, since the inception of an NSF grant fellowship program begun in 2007 (Grant Nos. 0623558 and 0966410 over the 6-year period, each glossed under “Sustainable Water Management Research Experience in Bolivia”)<sup>81</sup>. As such, some of the most targeted data about Sapecho (my field site) comes through annual reports from the study (Mihelcic et al. 2011). I have also benefitted greatly from the relationships that I created with my fellow scholars through this project, and from their work in the area. For a full overview of the projects in Both Sapecho and San Antonio, see the Annual Report from the overall project (Mihelcic et al. 2011).

Students at the University of South Florida were tasked with assessing the quality of the wastewater treatment system. They were not in any way tasked with the upkeep or management of the system, but they did offer assistance when they were able as a goodwill and collaborative gesture. Their assessments included but were not limited to measurements of nutrients released from the system, evaluation of the system’s state of repair, comparisons of pathogens within the system’s lagoons between entry and discharge, applications of Life Cycle Assessment (LCA) techniques, and evaluations of the potential for reuse of wastewater products. Furthermore, these studies all contributed to the broader goal of ensuring that scientists are trained to handle water and sanitation issues at a variety of scales and within several and differing cultural situations. As stated in Mihelcic et al., “water management institutions are fundamental to human societies. As dynamic challenges are faced at the global level, it is important that scientists and engineers are trained to integrate cultural, institutional, and international dimensions in order to form solutions with technologies” (2011:8). Students from several different disciplines worked together to ensure focus on these challenges and on the many levels that influence WatSan solutions.

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<sup>81</sup> This project is completely separate from USAID and ACIDI/VOCA’s development of the WatSan system in the area. However, ACIDI/VOCA was a collaborator on the grant.

Here I will present a brief overview of some of the foci of the engineering-based research which stemmed from this study (further discussed in later chapters). My dissertation as a whole was also funded by the project and the data gathered from the dissertation field season in 2012 spans the entire length of this document.

Several major areas of investigation were subsumed under the grant and were carried out by various engineers and anthropologists. In addition to studying maintenance practices, at several times during field experiences over the 6-year period sampling and testing of fecal coliforms, organic load, hydraulic load, inflow, outflow, and pathogen concentrations within the reactor, as well as biogas and methane gas production were studied (Mihelcic et al. 2011). Data stems back to 2007 for some indicators.

Those of my colleagues who have studied the Sapecho system in the fields of engineering and marine science have completed projects that speak to the efficacy and effectiveness of the Sapecho wastewater treatment system. I present the work here, roughly in chronological order.

At the start of the project, Ballard et al. presented a general overview of the wastewater treatment system as well as the systems in place in San Antonio, and Palos Blancos to the World Environmental and Water Resources Congress. They summarized the system's obstacles, which at the time included: "failure in operation, low capacity, insufficient funds for maintenance, system over-design, and the lack of knowledge base about the system from the community," and further argued that insufficient funding and knowledge were clearly related to issues with the system as a whole (2008:1). Helen Muga, James Mihelcic, Nathan Reents, Gabriela Gemio, and Santiago Morales presented a session at the Water Environment Federation which also focused on life cycle costs of the system in Sapecho, finding that 83% of the life cycle cost for the Sapecho system was related to the initial capital cost of the system implementation (2009). This showed that the maintenance costs for the system were underappreciated. Muga et al. (2009b) looked at the efficacy of the systems in Sapecho and

San Antonio in 2009, only two years after the system was placed. While at the time of that study the systems were “performing as they should” the team recommended regular maintenance, frequent cleaning/removal of sludge, and an evaluation of methane as an energy source (2009:5810). Unfortunately, as my study will show, these recommendations were not followed. This lends weight to the social side of this study, as the infrastructure as implemented was effective, but in the long term (my research occurred three and four years after system implementation) the infrastructure was partially failing.

Over the length of the study, the team has created a picture of WatSan infrastructure that shows the interplay between engineering effectiveness and social receipt. Valerie Fuchs and James Mihelcic focus on the appropriateness of sanitation projects in the region, where they looked at life-cycle, capital cost, and critical analysis of the types of sanitation projects chosen. They found that six factors, “modularity, decentralization, funded training and education, low water use, high access, and local management,” were key to the success of sanitation measures in the region (Fuchs and Mihelcic 2011:132). Fry et al. (2012) address issues of sustainability as gained from the literature, including inadequate investment, poor/nonexistent policies and governance, too few resources, gender disparities, and water availability to analyze barriers to sanitation coverage. Matthew Verbyla et al. (2013, 2014) have looked directly at the wastewater stabilization ponds’ ability to remove *Tanenia* eggs and *Ascaris* eggs in both Sapecho and San Antonio. The study found that the treated wastewater still contained *Tanenia* eggs sufficient enough to cause potential risk to humans for neurocysticercosis, and thus wastewater reuse, without changes to the wastewater system, was not recommended. Put more simply, the wastewater treatment system failed to adequately remove some types of pathogens, and so the team recommended that wastewater reuse not be attempted in the area. Pablo Cornejo et al. (2013) looked at employing Life Cycle Assessment techniques to address the energy, carbon footprint, and eutrophication potential of the systems in Sapecho and San Antonio. The study addressed these components in Sapecho vs. the

system in San Antonio, which is a three-pond system vs. a USAB reactor-two pond system, (see Cornejo et al. for more information on this particular technology). The findings from the study showed that while the three-pond system had lower embodied energy<sup>82</sup>, carbon footprint<sup>83</sup>, and eutrophication potential<sup>84</sup> vs. the USAB-pond system in Sapecho, the inclusion of biogas utilization from methane expelled from the USAB reactor could begin to rectify the greater environmental impact of the USAB-pond system. Sakira Hadley focuses on methods to detect bacteriophage<sup>85</sup> in order to address the possibility of wastewater reuse in the area (2013). My colleagues continue to publish their findings, and thus this list will only grow in the coming years post-experience (the NSF grant ended in 2013).

These studies serve to present issues with the Sapecho system from methodologies which are not in the purview of Anthropology, but which certainly bolster a holistic, ethnographic approach to WatSan in developing country settings. Whereas some political ecology approaches lack data on the effectiveness of infrastructure or on projected environmental impact, encouraging interdisciplinary looks at specific systems may, as it has here, serve to “round out” potential issues in WatSan and provide interdisciplinary data to relate to political-ecological claims. The students who took part in the study were, furthermore, very much influenced by the work of Stuart Oakley, a scholar who analyzes wastewater treatment in the developing world (Oakley 2004, 2006, Oakley et al. 2010), the theory of life cycle assessment (see Lundin et al. 2000 for a good overview) and the work of James Mihelcic (Mihelcic et al. 2007,2009).

My participation in the NSF grant was conducted in the final two years of the study, when it was suggested that an anthropological approach to WatSan issues would be beneficial

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<sup>82</sup> The amount of necessary energy to create and maintain the system.

<sup>83</sup> Amount of greenhouse gas emissions.

<sup>84</sup> Buildup of nutrients.

<sup>85</sup> Bacteriophage, or phage, are indicator organisms, which, when tested, can give the researcher an understanding of the efficacy of the wastewater treatment systems' technologies for ensuring the effluent is safe to enter the waterscape. This is meant to be an anthro-reader-friendly definition. For the specifics please see Hadley's Thesis (2013).

to understanding the space within which engineering initiatives were constructed, and the political, social, and environmental relationships that may have impacted the system's effect and efficacy. My application to conduct research from an anthropological perspective was accepted, and I was given a research fellowship for the years of 2011 and 2012, which supported my research.

### **The Influence of Student Researchers**

The individual students involved in the NSF project had a place in Sapecho and in the area of Alto Beni more broadly for several years. My research was the only ethnographic research completed in the region. However, the impact of the engineering and marine science students on the Sapecho wastewater treatment system, and on the community itself, should be examined. These students had a bounded impact on the committee members and key stakeholders in the community who worked directly with the wastewater treatment plant and on the infrastructure itself. I will note that the relationship, furthermore, was widely characterized as extremely positive, both for the students and the communities. While these students sometimes assisted with "fixes" for the wastewater treatment system, this was not their main goal during their research in the area.

One respondent in my study who was directly involved in the NSF project's coordination, answered some questions for me regarding the relationship between the student investigators and Sapecho.

*Maryann: And as far as the relationship between the universities and this community, what do you think that's been like?*

*Alan: Let's see... It's been a good relationship. In the past we have taken samples of the water from tanks and in the distribution system and the water sources. And the water committee has always been helpful. Taking us up there,*

*showing us around. So it's been a pretty good relationship. Last year one of the students from UTB was actually from Sapecho.*

*Maryann: What about, have you done any kind of maintenance with them? Have you help them keep the system running?*

*Alan: Yeah. Each year we've given them suggestions and things, after we've taken samples from their wastewater treatment system. Given them suggestions about how to maintenance the lagoons and things. And then we've also helped them build this kind of like, a net, to clear the aquatic plants from the top of the lagoon. And then a couple of years we've tried to fix the reactor (laughs). But we have not been successful.*

*Maryann: If this program ends, are they going to get aid from anybody? Regarding these problems?*

*Alan: They could possibly get aid from another organization to help with the maintenance, but it seems like they do have money coming in because they charge for the potable water, for the meters, but it seems like not quite enough. It seems like they may be pretty tight on money. So they would have to convince the community to pay a little more to take more care of the maintenance.*

*Maryann: Do you think that the program with students has helped to sustain it for this long?*

*Alan: Yes, I think so because people are showing interest in the maintenance being done and so that's made to each committee, each year... it's validated [the operator's] work more to show that it is important. That you can't just forget about the waste water system. They've been, compared to other communities, they've been pretty conscientious of wanting to keep the system working, and actually kind of proud of their*

*water system. Their wastewater system is [seen as] an example for other communities in the area. This year they mentioned that they're going to have a meeting [with other operators]...and they really want to have everything working, so that they can show other communities how well they have things working, so it's good.*

There are three parts to this conversation that reflect the ways in which USF has interacted with the community, and the effect of that relationship. The first is that the relationship has been viewed as beneficial to all involved and amiable, which I would corroborate from my own participation and through my own research methods (participant observation). The second is that the students at USF (mainly from the Engineering school) have taken samples, completed research, and directly tested and assessed water quality, and have reported on that data to the partner university and to ACDI/VOCA (Mihelcic et al. 2011). Engineering students also completed small reports that ensured necessary information was given to the community after each field season (personal communication/experience). They have also assisted as best they could with emergent issues seen in the wastewater treatment system. This testing has given the community more information than communities without access to these data—although these data seemed to be unknown at the time of my research on the part of the committee or the community at large, regardless of the due diligence of the students. Some community members still felt that the students were not adequately communicative or that they came, took samples, and then left. The third point is that due to the relationship with USF, the community and the water committee have had a greater interest in maintaining the system, and the operator's role has been particularly validated by USF's relationship. This last point, about people showing interest in the maintenance that is being done, is I think one of the most poignant pieces of our conversation. Even with the influence of an outside eye, data gathered from outside researchers, fixes offered by trained engineers, and greater attention to the WatSan system because of the team's very presence over the 6-year

period, the system was failing at the time of my research. Even with a cadre of engineers, scientists, and an anthropologist (me) checking up on the system once yearly, even with the relationship with ACDI/VOCA being overall perceived as beneficial and good (see Chapter 3, 4), and even with heightened interest in maintaining and ensuring that the wastewater treatment and water systems were running correctly—the wastewater treatment system failed.

And the operator's tasks, even though they were validated and lauded with the influence of the students encouraging his position, were still widely perceived as unpleasant to the point that practically no one in the community outside the committee would volunteer to assist with the wastewater treatment plant (see chapter 7). Certainly, the relationship with USF students and staff may have assisted the community and made them even more able to manage their system, but even with this, things weren't working. So, what went wrong with the system? And why? My research addresses this quandary by interrogating the ways in which WatSan management, use, and perception have influenced the long-term outlook of the system.

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<sup>1</sup> “Mi relación es la del financiamiento. USAID es el financiador, el colaborador financiero, y nosotros somos sus ejecutores. Por lo tanto mi trabajo principal es hacer quedar bien a USAID, ejecutando buenos proyectos. Tengo que garantizar que los fondos de los norteamericanos sean bien utilizados.”

<sup>2</sup> “Bueno, la cooperación internacional en Bolivia definitivamente ha cooperado mucho, pero podría hacerlo mejor. Lo que pasa es que muchas veces, se plantean programas, se diseñan fuera de Bolivia; con visiones de personas que no están relacionadas ni con la vida, ni con la cultura, ni con muchos aspectos que son necesarios a considerarse a la hora de fabricar o programar políticas e intervenciones en otros países.”

<sup>3</sup> “Trabaja, nosotros somos USAID, USAID trabajamos con erradicación de la coca, o sea para que no haya más coca en Bolivia, supuestamente para que no haya, entonces entramos a lugares específicos que da USAID y decimos, bueno en convenio con el gobierno, con el viceministerio de la coca, decimos: bueno en este sector hay mucha coca, ya noo queremos que haya mucha coca, entonces corten talen, erradiquen plantas de coca, y en vez de eso nosotros les vamos a dar proyectos, dicen ¿no?”



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<sup>4</sup> “Doy derecho a la madre tierra, pero en otro punto de la misma constitución declaro a la hoja de coca como producto principal de Bolivia”, la hoja de coca degenera los suelos, en unos años los hace incultivables. Si bien su producción es buena para la economía de los campesinos, sin embargo los resultados son terribles. Por un lado se genera una economía peligrosa. Narcotráfico. Los jóvenes, la gente está, puede llegar a caer en este mal, consumo de drogas, venta de drogas, llegar a la cárcel, estar enfermos, ese es uno. Por otro lado a la madre tierra la estamos dejando sin tierra. Entonces medio que no hay mucha relación de lo que a veces solo hablamos pero hacemos otra cosa.”

<sup>5</sup> Sí, aunque para ellas es más trabajo, es que en su trabajo de campo, las mujeres son las que se levantan primero y se acuestan después que todos. Además hacen el cuidado de los niños, si son varios, a todos, apoyan al trabajo de campo del varón. Entonces darle trabajo dirigencial o este tipo de trabajos, a ella se le incrementan sus responsabilidades.

**CHAPTER 4:**  
**THE COMMUNITY, HISTORY, AND INDIGENEITY**

**Notes on Sapecho, Chickens, and WatSan**

From my fieldnotes:

*I'm becoming increasingly convinced that one cannot live in Sapecho without beginning to truly appreciate chickens. As I sit in the plaza, a gaggle of chickens is clucking along, using the sidewalk their own personal causeway, their bright yellow feet strutting, their plumes bright.*

Frankly, chickens were a clear and present part of my life in Sapecho in a surprising and unexpected way. They woke me up in the morning:

*This morning I woke to a racket between a rooster and a couple of hens that sounded like they had all three been shoved into a bingo cage and swirled about for the whole of the morning, before one was pulled out and read as a lucky number—they must be tasty, but they sure are loud.*

Little hatchlings were raised in the room of my key informant's daughter, and she cuddled them, treated them as pets throughout the day, and often brought them out to show off to visitors.

As I was usually on time to meetings when others arrived late (and thus usually was waiting around a long time), I had plenty of time to notice chickens. They were just everywhere. So much so that Sapecho residents barely noticed them. Except, of course, for the time that a bunch of little chicks interrupted the soccer game that was on TV:

*A big group of baby chicks swarms the concrete patio outside, making a racket of little cheeps as their cute little bodies run to and fro. Soon, the owner's son is running after them, but not catching a one. The noise is startling as during the game not one mouth moves, other than to form an obliged laugh for the TV announcer.*

One day, I even saw chicks being scooted off a concrete patio with a broom, and it was the cutest and most terribly doomed sweeping experience I've ever seen. Baby chicks are crafty.

So what is the relationship between chickens and Water and Sanitation? Here's the thing. The whole time I was in Sapecho, I was wondering how on earth people could tell their chickens apart. There were chickens everywhere. They colonized the square, their racket woke me up, and they interrupted soccer games. But they weren't in cages, they weren't in any particular order, and they seemed to just have the run of the place. Finally (finally!) someone answered the question. For months, people had just looked at me as if I was weird when I asked how they could tell their chickens apart, and so I stopped asking after a bit. But one lady finally told me. She said... "They look different."

They look different. To me, these chickens were identical. To the people of Sapecho, though, they were obviously different breeds, different quality; they were marked by different shapes of the thing on the top of their head and the thing on their chin (which I now know are called a comb and a wattle, respectively, only because I googled "chicken terminology" and ended up at the tractor supply company website) I was so surprised the first time I saw a chicken that was neither a baby nor an adult (they look bizarre in the middle, like little dinosaurs) that I said out loud (much to my eternal regret)—"What's wrong with that chicken?" "It is a teenager," one of my research assistants told me. "Oh."<sup>86</sup>

My point in talking about chickens here is that when people complete projects in unfamiliar countries or communities they often come from such different positions and

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<sup>86</sup> Incidentally, a teenaged chicken is called a "pullet."

perspectives that they fail to see difference. Something that looks the same to an outsider can often be very, obviously, and inherently different to an insider. Understanding the “who” of Sapecho, the pace and way of life of the people there, and yes, the chickens, is central to understanding how, why, and to what extent WatSan policies are effective, what issues people have with WatSan, and how WatSan can be better and more equitably distributed. Social nuances are certainly not irrelevant to WatSan issues, even for those who think their technology is appropriate, or who have worked in other areas of Bolivia or other rural areas of the “global south.”

Thus I found that the most detailed and personal things about WatSan were completely different than I expected; number of showers per day, perceptions about toilet paper use, thoughts on toilet seats, comfort level with chlorination. None of these things can be taken for granted. Sometimes, things about WatSan just look different. And it is in these differences that we find the real struggle for WatSan practitioners; it is that difference of perspective, in these “obvious” things to the people inside that people from the outside miss, that miscommunications and mis-steps in policy occur. But it is there, too, that problems can be addressed if enough scholars begin to look closely and share their knowledge.

This perspective is old hat for the anthropologist. We look for the emic (the insider view) in all things. But, my advice to the wider WatSan community would be not to make assumptions about WatSan practices, even if it is tempting to think of some perspectives, actions, or viewpoints on WatSan as universal. WatSan and chickens do have something in common. The people of Sapecho care about both, and while the choices about management, use, and practice of WatSan in Sapecho might not make immediate sense to the outsider, they make sense to them. In the next chapter I set the community of Sapecho into the context of the wider region of the Yungas, focus on gender and ethnic background, and discuss how these

community demographics and lived experiences relate to WatSan development in local settings and the human right to WatSan.

## **Introduction**

Many people who I met during my fieldwork argued that visiting Bolivia was like visiting the whole of South America. Bolivia has everything— snowy mountains, lush plains, sweating jungles. It has modern areas and places where people still live without electricity or running water. Much of the western literature and media about Bolivia, overwhelmingly focused on coca production (Allen 2002, Conzelman 2007, Farthing 2005, Unlu 2012) or Cochabamba’s water wars (Albro 2005, Olivera 2004, Schultz et al. 2003), makes Bolivia seem like a tangle of protests, movements, and resistance. In anthropology, indigeneity takes center stage, and arguments over the extent to which Bolivia is an “indigenous” country, what that means, and what we can learn from or critique about that indigeneity abound (Canessa 2012, Hedin 2011, Jackson 2012, Postero 1995). I think that might be why, when I landed in Sapecho, I was a bit surprised at how sleepy and relatively calm the little town was. Without painting it as idyllic, it was certainly not the expected riotous and charged environment, full of people rushing the town hall or vociferously touting ideological positions on their own rights or realities. Mostly, people in Sapecho were hardworking, open, everyman/everywoman types. That isn’t to say that there weren’t distinct and impressive individuals, or that Sapecho residents weren’t unique in any way. It is just to say that it was a community—a cohesive one—that had a slow pace, a large workload, and a focus on the everyday. It was also full of people whose well-formulated viewpoints differed from the literature and from the media. People’s main concerns were family, work, food, and water. When asked directly what their greatest daily concern was in one word (open-ended), 18.9% of my survey sample said economy/money, 17.4% said water, 14.5% said work, 12.3% said health, and 11.6% said family (with other concerns including food, land, education, at less than 5% each). Sapecho is interesting in part because it is so basic. The

town is small, it hasn't been in the news for anything, and it hasn't been the site of anything outstanding in the international or local community. But, its basic nature makes it a good location to study WatSan acceptance and relationships. Veronica Strang describes her field site in the Stour Valley as "both typical and unique," and forwards the idea that there is a specific cultural landscape in the area but that the community is also part of "wider social, economic, political, and cultural processes, and its ecological issues are replicated in many places" (2004:9). This is certainly the case in the small town of Sapecho. It is struggling with issues similar to many other communities which absorb new community-based water systems, but in specific and situated ways.

I begin this chapter by discussing the wider space surrounding Sapecho—the Yungas (*Los Yungas*). Then, I zoom in to Alto Beni more broadly, and finally to Sapecho. Along the way I highlight the social, political, and water-specific concerns for the region, as well as anthropological and other academic literature that has focused on the zone. I work to set the place of Sapecho in the wider scope of Alto Beni and the Yungas, and to introduce the community as a whole (with specific focus on identity and place).

### **Setting Bolivia**

Within the Yungas region of the La Paz district in Bolivia, water and sanitation development has been intimately tied to the region's historical relationship with the Bolivian government and with funding entities from donor states (e.g. United States Agency for International Development (USAID)). The combination of the country's colonial past, the impact of neoliberalism and structural adjustment plans, and the relatively recent focus on human and environmental rights instituted by Evo Morales' leftist government, sets issues of water and sanitation (WatSan) in a disjunctive web of politics and policies which impact the area's development prospects. Furthermore, variations in ethnic identity, class status, gender, demographics, location, and space combine to produce regional and social influences on water

and sanitation. In 2001 (the year of the latest Bolivian census), approximately 90 percent of urban and 39 percent of rural Bolivians had access to potable water, and 69 percent of urban and 33 percent of rural inhabitants had access to sanitation (Iturri 2001:13). Both internal government efforts and foreign aid projects have sought to improve WatSan availability in the late-19<sup>th</sup> to early-20<sup>th</sup> centuries, but the extent of these programs' effectiveness and sustainability is debatable. Further information focused on how these WatSan needs are being met in Bolivia, what forces are driving the provisions of such resources, and the impact of these programs on communities is necessary to inform the current status of WatSan development, and this need is what drives my following discussion.

### **Focus: The Yungas**

The Yungas region of the La Paz district in Bolivia consists of 8 municipalities, Coroico, Coripata, Irupana, Yanacachi, Chulumani, La Asunta, Palos Blancos, and Caranavi. The first five of these are part of the region called the "traditional zone." The entire area of the Yungas is home to approximately 250,000 individuals (Bernstein 2002:3). The Yungas (*Los Yungas*) is home, perhaps most famously, to *cocaleros*, or people and groups that grow coca (Conzelman 2007,2008, Hylton and Sinclair 2004). Evo Morales, the current president of Bolivia, was raised in a coca-growing region (although not in the traditional zone); still, this relationship gains these areas a great deal of political attention. The traditional zone was also "for decades...subject to military, including U.S. military, intervention" (Canessa 2012a:20). Furthermore, it had a strong working-class movement.

While groups in the region are mainly of Aymara and/or Quechua background, Hylton and Sinclair argue that identity in these areas is more based on labor union organizations than on pre-colonial indigenous groups (2004:16). Both the strength of labor movements and coca-growing sets the traditional zone apart from the other areas of the Yungas. The traditional zone has an anthropological following, notably because of its position as a coca-growing area that

has been strongly impacted by the U.S. (for more information see the work of Carol Conzelman 2007, 2008, Canessa 2012a, Kohl and Farthing 2006, Perrault 2008).

The region as a whole is home to more than *cocaleros*, although a focus on agriculture is region-wide. Agricultural workers who grow coffee, citrus fruits, and cacao are common. As a whole, Aymara and Quechua backgrounds dominate in Los Yungas, many of whom were part of colonization efforts in the mid-1900s (Edmundson 1967, Canessa 2012b). Small pockets of afro-Boliviano communities are also part of the region (most notably near Coroico). Traditional dress (e.g. *polleras*<sup>87</sup> and bowler or straw caps for women) and aspects of traditional management still come into play (Knoerich nd). Dwight Heath's ethnographic work (1979) gave a picture of the historical (colonial and post-colonial) indigenous makeup of the region as a whole. Only one area of the Yungas was considered, during colonialism, as an indigenous community (i.e. a community which actually was able to claim land)—although Heath does not state which area fit this description. Many of Aymara and Quechua background were simply considered as poor landless peasants. The area had a large part in the revolution of 1952 (Heath 1979:75). Heath argues that the *ayllu*<sup>88</sup> is not as important in the Yungas region as it was in the altiplano for Aymara and Quechua individuals (1979), as do Nelson Aguilar and Alison Spedding (2005), but the work of Albro (2010) has argued that the *ayllu* was an element of agrarian unions post-1952. Osco Marcelo's recent dissertation, *El Ayllu y la Reconstitucion del Pensamiento Aymara*, covers the complex use and re-use of the concept of *ayllu* in the country of Bolivia as a whole, but does not specifically focus on the position of this in the Yungas region (2009). Thus, the extent to which individuals in non-coca growing regions of the Yungas connect with indigenous heritage or the *ayllu*, draw from traditional practices for political organization, and identify with ideas surrounding indigenous identity, is under-researched.

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<sup>87</sup> Traditional layered skirts.

<sup>88</sup> *Ayllus* are pre-Inca forms of political and social organization that were employed in both Aymara and Quechua communities (Marcelo 2009).



### **Alternative Development in the Yungas**

What we call “alternative development” was a project spurred by the United States and its agenda related to coca and the reduction in coca growth (Conzelman 2005). The European and U.S.-based demand for coca produced a nuanced force in the lives of rural Bolivians in the Yungas. This demand for a traditional crop made certain Bolivians affluent and put others under the thumb of a new and violent trade. The U.S. worked to control coca proliferation with development offers (Weatherford 1997:33). As per USAID’s website for the Bolivia La Paz district, “the alternative development programs of USAID help the government [of Bolivia] to increase economic opportunities, income, and living conditions...mainly in the region of the Yungas. This was part of the U.S. Congress’ funds related to “Plan Colombia” wherein \$80 million was allocated to USAID in order to fund “counternarcotic efforts” which included the Yungas Development Initiative, or YDI (Bernstein 2002:3). These projects involved WatSan efforts, as well as other projects related to change in agricultural products and basic needs. Thus, the status of WatSan in the area is intimately tied to both the anti-coca growing movement and the United States’ assistance. Conzelman (2005, 2009) argues that these development programs had negative impacts, at least in the traditional zone. Development programs’ impact on the non-traditional areas of the Yungas is a key element of my investigation.

### **Water and Sanitation in the Yungas**

A basic needs index (NBI) for the Yungas area (created in 2008 by ACDI/VOCA) states that the region’s accessibility to water for basic household needs has increased since the 2001 census statistics from the Bolivian government, from 53.8% to 77.9%. It further states that accessibility of sanitary services has increased, since 2001, from 46.6% of inhabitants to 63.3%. Of course, this document was both researched and distributed by the agencies that were in-place to meet these needs, so the statistics (based on non-random samples) should be taken only as potential guideposts. Regardless of these possible improvements, the Yungas region is

home to great need related to water and sanitation, as evidenced by the high rate of inhabitants without access to these services in the census. Research outside of this document related to water access and sanitation coverage is lacking, and no anthropological research has covered this field of study in the Yungas region. Heath's (1973) ethnographic account gives little attention to water systems, saying that the Yungas indigenous populations did not lay claim to the infrastructure earlier than the 1952 revolution, although I suspect that in reality this relationship is more nuanced than he allowed. Further, he noted that post-revolution projects could be suggested by indigenous petitioners on behalf of their community, and that the request could be sent through the ministry and then to the United States Operations Mission (1973:92). However, this information is more suited to give a background of U.S. involvement in public works such as water and sanitation than to explain the nature of WatSan functionality in the 70s, and it does not, of course, outline the current state of WatSan provisions today. The extent to which water and sanitation are an aim for communities in the Yungas, how water and sanitation is provided, what types of water and sanitation infrastructure are implemented, and the sustainability of these programs varies by region, city size, and relationship with donor agencies. INGOs such as *Cooperazione Internazionale Sud Sud* (CISS) (headquartered in Palermo, Italy), ACDI/VOCA, USAID, and Caritas all are actively participating in water and sanitation projects. Each agency, and each region within the Yungas, has different grey literature<sup>89</sup> related to WatSan issues. Thus, I will now focus on the Alto Beni region of the Yungas, where Sapecho is located to speak about specific situated knowledge related to place, WatSan, and development gleaned from these documents and from other work in the area.

### **Alto Beni**

With this larger context in mind, I now wish to distinguish Alto Beni from other areas of development within the Bolivian state, and to specifically outline the relationship between this

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<sup>89</sup> "Grey literature" here refers to agency publications (non-academic and non-peer reviewed).

area and the U.S. as it relates to WatSan and regional development. I also give specific reference to Sapecho, where information is available. Alto Beni, while part of the Yungas, has little in the way of coca production, and thus is fundamentally different from the traditional zone, both in its position related to the U.S. and in its position socially, politically, and economically in the Bolivian state. Relationships with development agencies, government attention for funding and water, population, and urban areas all differ between the traditional zone and the Alto Beni. Furthermore, Alto Beni does not have much of a place in academic literature. Several publications from environmental engineers from my own NSF program (under Dr. James Mihelcic) give the only academically-grounded insights into the WatSan infrastructure of the area (Cornejo et al. 2013, Fry et al. 2012, Fuchs and Mihelcic 2011, Muga and Mihelcic 2008, Muga et al. 2009, Verbyla et al. 2013). Other than this, reference to Alto Beni's water systems are only found in the program files and reports from ACDI/VOCA and USAID. The region's status related to colonization and growth is noted in a 1967 publications in the field of dermatology and geography (Edmunson et al. 1967, Feifer 1967), as well as the work of geographer Anthony Bebbington (1997). Works of biologists and doctors of medicine also come out of the area, focusing mainly on local flora and fauna and transmission of diseases. No anthropological work has been completed in the area, to my knowledge.<sup>90</sup> This section covers main issues for the Alto Beni region, including the history of USAID-assisted "colonizing" efforts, alternative development, the position of WatSan within the region, and discussions of ethnicity, place, and class. Throughout I point to potential areas of difference for Sapecho and the Alto Beni area.

### **Ethnicity and "Colonistas" With the Help of U.S. Programs in Alto Beni**

The ties between the United States, USAID, and the Alto Beni region of the Bolivian Yungas are deep. As early as 1967, scholars noted that "colonization is being encouraged in

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<sup>90</sup> This statement stems from a search for literature on "Alto Beni" using USF World Cat search premier, Google Scholar, and Google in both English and Spanish.

this [Alto Beni] area, which is being developed with the aid of the U.S. Agency for International Development and the Civil Action U.S. Army Unit” (Edmundson, et al. 1967:64); this also included a push from the Bolivian government. The agricultural incentive projects spurred movement from the *Alti Plano* to the *Yungas* regions for *Aymara* and *Quechua* groups, who soon co-opted traditional lands of other indigenous populations like the *Mosetene* (Bebbington 1999, Feifer 1967). Many individuals in the *Alto Beni* region, specifically, were given incentives to move to the *Yungas* area, and now hold a unique position, as both indigenous (Aymara/Quechua) and colonizers (*colonistas*, hereafter colonistas) of others’ indigenous land (Postero 1995:46). These groups are also called *interculturales* (Barrientos 2011). Aymara and Quechua backgrounds and cultures are dissimilar from *Mosetene* and other groups in the region, with the former being traditionally highlanders—and there is little mixing between these groups (Canessa 2012b:13, Edmundson 1967:66). During my own research this division seemed intact, with no *Mosetene* residents living in Sapecho and respondent-reported ethnic and cultural difference between the groups. Gender relationships within the community and related to WatSan, as yet un-researched in the area, is a key issue raised in the following chapters.

### **Alto Beni’s Place in Alternative Development**

In the Alto Beni region in general, coca production is less common than in the more widely-researched traditional zone, although it is an area of risk for future growth. Thus, individuals in the area were given incentives related to reducing coca farming (such as potable water and sanitation projects through U.S.–based aid funded alternative development initiatives), but the terms to which they were required to agree neither impacted their social or economic ways of life (author’s own research). This position is in direct contrast to much of the research on Bolivia’s relationship with USAID, which highlights negative impacts from the coca-reduction initiative (Conzelman 2008, Conzelman 2007, Farthing and Kohl 2010, Kohl and

Bresnahan 2010). All carrot and (at least related to coca) no stick, USAID funds swept through Alto Beni related to numerous projects, including WatSan, education, and agricultural development. Six WatSan projects have been implemented in Alto Beni through a partnership with ACDI/VOCA and funding through USAID, including Arapata, Coripata, Palos Blancos, San Antonio, Sariaria, and Sapecho, wherein “water and sanitation are managed together by local community organizations” (Fuchs and Mihelcic 2011:123). The place of Alto Beni is an interesting test-case for analyzing the impact of the colonial, post-colonial, neoliberal, transnational, and rights-based forces which relate to WatSan development in Bolivia. The politics of place and history impact its position related to voice, agency, and positioning for WatSan infrastructure development and management, both in relation to the U.S. and to the Bolivian government. The area has the potential to elicit unique behaviors and values related to WatSan, but there is also the potential for gaining widely-relevant detail on how ethnicity, class, gender, and place impact WatSan structures. Sapecho, specifically, has unique characteristics which are distinct in the area, and which mediate the community’s relationship with development, WatSan, and identity. The specific position of Sapecho will be discussed after a brief discussion of the methods used to gather community-level data from the area. The technical aspects of these methods are discussed in more detail in the insert in chapter 2, for reference.

### **Study Population**

In order to look at community-level data from a variety of vantage points, I employed four different data collection techniques in Sapecho, including interviews, surveys, community-led mapping, and participant observation (see chapter 2’s “A Note on Methods” for more information). Notably, for the survey, I chose to include anyone living in the area of Sapecho that was considered residential (where individuals had their first residence). This included several neighborhoods in Sapecho proper (one of the stops on the water system). Furthermore,

I included people who were part of Sapecho's community (e.g. participated in events, etc.) but were not technically in Sapecho proper, but instead lived in Brecha A or 24 de Septiembre. These communities still received water from the megaproject but had a different tank and were technically represented by other water committees. Other stops on the megaproject line were far removed from Sapecho's day-to-day life and also consisted more of agricultural lots than residences (e.g. had few families who lived there full-time). Due to time constraints and feasibility (population size and accessibility), these other stops on the megaproject line were not included. Initially, I thought I would leave out 24 de Septiembre and Brecha A, but it became clear that leaving them out would be leaving out a clear portion of the Sapecho community. Thus, when necessary I divide responses by neighborhood/sector (e.g., when looking at specific perceptions of Sapecho proper's water committee), and at other times I represent the perceptions of the community as a whole.

Interviews, surveys, and maps were best done on the spur of the moment. While people were busy, their schedules were generally flexible, and apart from those who worked in Palos Blancos<sup>91</sup> or other areas, the most common answer to "when might you have time to do an interview?" was "right now." This was important to note as it both helped and hindered our research plan. The good news was that people would talk immediately if they could; the bad news was that if, for some reason, they could not speak at that moment, there was little possibility of being able to schedule an appointment. It was best just to say, "I'll stop by again later this week, then?" With the surveys, people were often in their homes and easy to ask for a survey, although during the week we often encountered more women than men. So, we staggered our timing for the surveys. We had a morning shift, an afternoon shift, and an evening shift. We also worked weekends and took time off during the week, hoping to get men at home. Saturday mornings were generally out, as that was market day, but we were able to

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<sup>91</sup> Palos Blancos is the closest nearby town.

find find some families at home who weren't at the fair. Sundays were good, although it was important not to overstay our welcome, as that is the one day in the week people get to rest. This is an average setting for a survey (from my fieldnotes):

*On one of our survey trips, we dropped in on a family at the very beginning of their Saturday morning. They were just hanging out together, and the husband was very nice about stopping for the interview. We sat down in a little covered area, in plastic chairs on a concrete slab floor under an open canopy, four wooden rods with a thatched roof. A small scattering of other chairs was there; they used the space as a sort of kitchen. They had a hot plate and a couple of buckets. Halfway through the interview, the mother brought out a big plastic bowl and a chubby naked baby, and started giving him a bath in the middle of the space. The child just kind of looked confused, and stared at us. The mom was smiling, but also wondering why we were there asking questions about water.*

The combination of research methods meant that we had different vantage points within the community. We had the opportunity to speak to several different families as part of the survey, and then also were able to get targeted information from those who could act as informants on specific water issues. The pace of data collection reflected the general pace and disposition of the community, in that people were willing to make time to talk and were widely friendly, and this was integral to successful data collection.

## **Sapecho**

Basic demographic data are presented here alongside ethnographic discussion in order to ground the reader to the general “building blocks” of life in Sapecho. The demographics section is brief, meant to only orient the reader, as each of these components will be discussed in more depth, and vis-à-vis WatSan, as the work continues. I weave together the survey dataset, interviews, focus groups, and my own fieldnotes to frame this section.

While several estimates of the size of the population in Sapecho exist, there is no specific census data for the area. Based on average household size gained from my survey and number of families reported to me (approximately 270), I estimate the population to be approximately 1,462 persons. The survey I designed was employed to reach one individual from approximately half of the households, for a total of 138 respondents. This translates roughly to just a bit less than one quarter the adult population. Respondent ages ranged from age 18 to age 78 (for an average age of 41).

### **Pace and Place**

Sapecho is located just off of Route 3 in Sud Yungas, just near the Rio Beni (about 224 kilometers from La Paz) (see Figures 5 and 6). The community is about 406 meters above sea level, and it is considered tropical and humid (FiBL website). Sapecho is often either unknown (as it is a small, rural town) or recognized by some as one of the agricultural headquarters of El Ceibo, a well-known chocolate cooperative in Bolivia. People from Sapecho often just say they are from Palos Blancos (that larger town a bit further down the road).

At the time of my fieldwork, the community of Sapecho branched back from the dirt road, but to the passer-by Sapecho looked like not much more than a few streets with a restaurant, a little hotel, and a pharmacy. People's agricultural and home lots were flush with citrus fruit, and throughout the town trees were weighed down with banana, plantain, star fruit, oranges, mandarins, seven flavors,<sup>92</sup> or other citrus fruits. Families were often seen working together in their yards, doing laundry or tending gardens. They were often flanked by toys and clothing on lines and bits of jerry cans and other repurposed containers (which often contained seedlings). The houses were well-loved and comfortable, distinctly lived-in. Sounds of children running, playing with toys, rocks, mud puddles, or marbles, rang out over everything.

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<sup>92</sup> I have never seen this fruit in the U.S.; it is like a big, sweet, lime-flavored grapefruit.





Figure 5: La Paz (A), Sapecho (B), courtesy of Google Maps

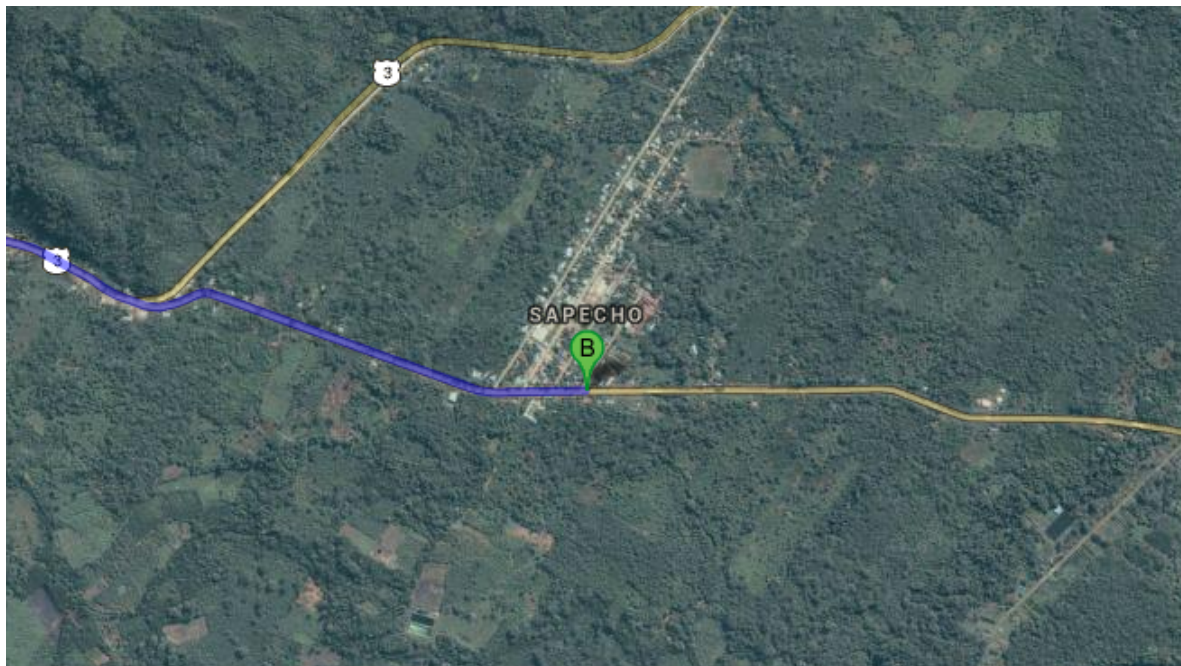


Figure 6: Zoom on Sapecho (B), courtesy of Google Maps

Women were often seen sharpening their machetes or tending chickens. Men, markedly absent during the day, could be seen trekking to their agricultural plots early in the morning or returning

later in the evening. In the area, peoples' lives were slow-paced and yet not at all leisurely. Everyone worked hard, and their sun-lined faces and work-hardened hands and feet were evidence to that fact. In contrast to the Palos Blancos, Sapecho residents felt that their lives were peaceful, relaxed, and tranquil. "Those things don't happen here" was a common response to worries over crime, violence, and unrest more common in other areas.

Football (soccer) was a clear focus for the town, and the impeccably well-kept, green field was the most beautiful thing in the whole community. Football was a central pastime, and airings of football games, when available, were blaring from every TV that wasn't busy entertaining a gaggle of children with some cartoons. While people were usually clad in clean but well-worn and stained clothing, football gear was shiny and brand new-looking on everyone. People got up early in the morning (around 4 or 5 a.m.) and the daylight was savored. No real night scene existed, except for a discoteca that was reportedly open on Saturday night, although I never saw it open or visited it at all. There was no movie theatre or large market. Things got pretty sleepy after 9 p.m. unless it was a holiday.

### **Household Makeup and Income**

The average household size in Sapecho was 5.3 persons, with a maximum of 18 and a minimum of 1 (standard deviation of 2.6). Extended family commonly lived within one house, although single-family homes (parents and their children only) do exist, and were notably more common in younger generations (see Figure 7).

While the average size was 5.3 persons, families felt much larger than that. People often lived on communal land, where grandparents' homes were built and then houses had sprung up on the same land for several generations. It wasn't uncommon to have one gate open up to a plot with three or four homes, all of which belonged to relatives.

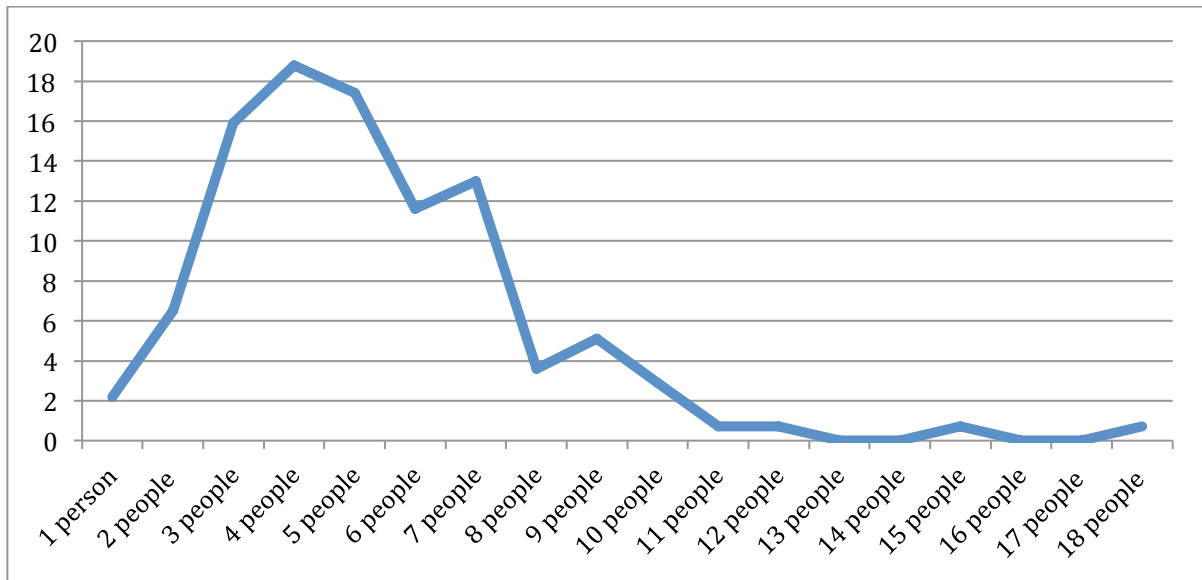


Figure 7: Number of People in Household By Percentage of Respondents

Sometimes it was hard to be sure which children belonged with which parents, as there was a communal nature to the family life as well as the overall lifestyle of the area. Once, when I was completing an interview, a respondent's two-year-old got a little fussy. The respondent put a couple of pesos in the child's hand and sent her down the street to buy a piece of candy, knowing that the store operator would watch the kid for a bit.

### **Economics and Status**

The average weekly household income was, for most families, somewhere between 1-900 Bolivianos, with 17.4% of the population making between 0-100 Bs, 26.1% making between 101-300 Bs, 34.1% making between 301-500 Bs, and 13.8% making between 901-1100 Bs. Approximately 8.6% of the population makes more than this (See Figure 8). For reference, a meal at a restaurant often cost approximately 15 Bolivianos (about 2 U.S. dollars), a personal-size soda costs about 6 Bolivianos (about 0.75 U.S. cents), and a roll of toilet paper about 2 Bolivianos (about 0.25 US cents).

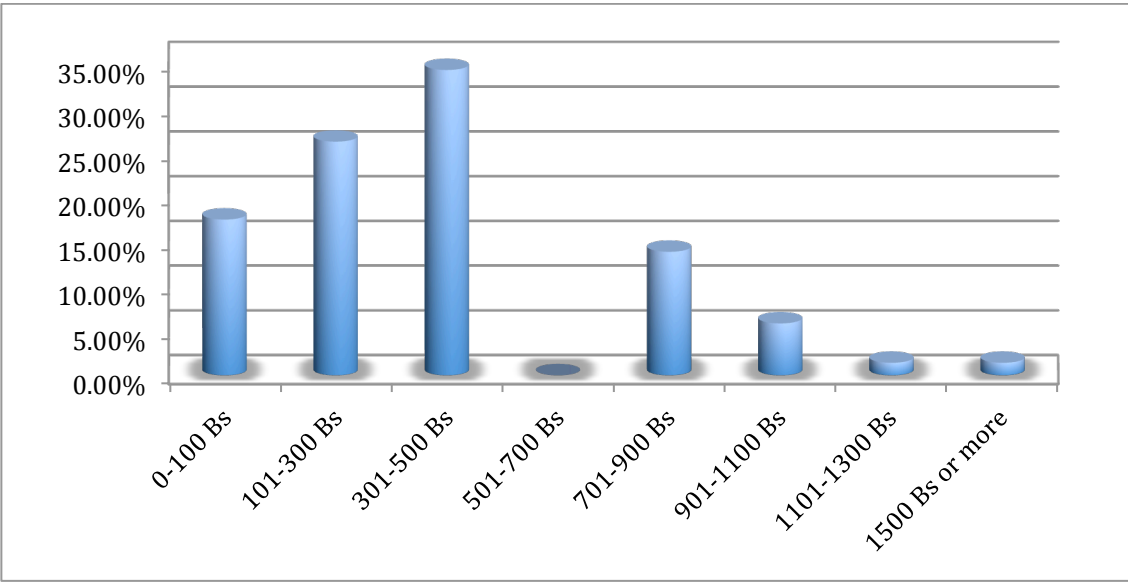


Figure 8: How much does your household make a week in Bolivianos?

The largest employer in the area, El Ceibo, was a cacao cooperative that buys cacao from individual family growers. This did not constitute full-time employment for most, although those with full-time employment at El Ceibo were some of the best paid in the region. Fifty-two percent of respondents owned land in their own name, but most either worked on (or worked in an industry related to) agricultural land. Banana and plantain, citrus, and cacao were grown on most agricultural plots. Notably absent from the terrain was coca, as it was not traditionally grown in Sapecho. Other areas in Alto Beni do grow coca, a more lucrative (but more contentious) crop. As Marcelo, one of the interview respondents, noted, Bolivians “have their feet in the earth...they are in contact with nature, the [natural] lifestyles, the atmosphere, the environment.”<sup>6</sup> While many sold their produce at markets (such as the one in Palos Blancos), it was also relatively common that families exported their agriculture or their handicrafts; 34.8% of the respondents exported one or the other outside of Bolivia.

## Gender

Gender equity among respondents was sought throughout the project. However, women were more available for surveys, and thus are somewhat overrepresented in that portion of the project. The gender makeup of the survey was 44.9% male and 55.1% female. Women and men's roles were generally clearly outlined regarding labor, with men usually participating in agricultural work and women doing housework. That being said, some men worked professional jobs (either in Sapecho or in Palos Blancos) and many women had small shops, kiosks, or snack stands where they sold food, candy, or housewares. Most adults were married (56.5%), with widowed (5.1%) and divorced (1.4%) individuals being comparatively rare. Single individuals made up 24.6% of the sample. Marriage age is very young in Sapecho, with women commonly married at the age of 15 or 16 and males commonly married not long after that. Many of the single individuals in the study, however, were older children in the family, and due to western and modern influences some girls and women were getting married later in life and even attending college.

Monica described a day in the life of a Sapecho man and woman as the following:

*What I've seen. I'm really conservative...it's the same story for all, though, we all go to work early and don't return until five or six in the evening, and at six we are all home from everything and everyone is hoping for their supper, which the wife is going to make. And after that everyone sleeps, this is life. Every once in a while there are things that are fun to do, a carnival, or something special at the high school where they invite everyone to go over there. But after that there isn't anything, in the nighttime people walk around because the air is cooler and you can get out a little, because in the day you can't walk leisurely.<sup>7</sup>*

While she discussed both genders in our interview, she went on to note that it was harder for the woman than the man — they wake up at 4 in the morning to cook, and then they do all the

same work as the man, and then come home and cook again. Work was certainly not something unknown by anyone in the community. Abraham noted that “generally here the women are housewives, nothing more. Housewives, the community is always a little sexist, the women is there [in the house].<sup>8</sup> Women’s’ workloads are a key component of chapter 6’s discussion on WatSan use and management. Unlike La Paz, where domestic help was common in more wealthy households, I saw no *empleadas* (maids) or household workers employed in Sapecho.

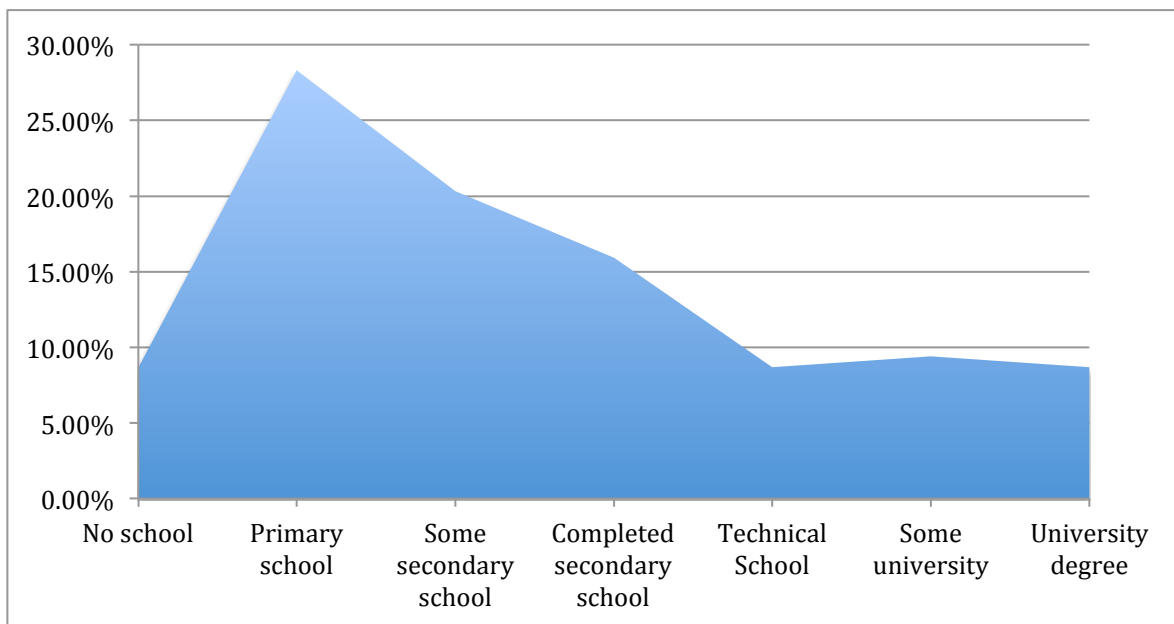


Figure 9: What is the highest level of education you completed?

### Education and Access to Education

Access to education was not historically afforded to all in the community, and many people in the area did not complete high school. From the survey, 8.7% of the respondents completed no school at all. 28.3% completed only primary school, 20.3% completed some secondary school, 15.9% completed secondary school, 9.4% had some university, 8.7% had a university degree, and 8.7% had graduated from a technical school (see Figure 9).

While overall education levels were low among the adults surveyed, most children did have access to education at a primary school. Although many students did attend secondary school, other teenagers, especially females, got married or started work at younger ages. Agricultural workloads and family responsibilities often required childrens' attention, and thus sometimes interfered with secondary school attendance. The community did have a primary school, high school, and agricultural college in town, and young people often wanted to attend college either in Sapecho for agricultural studies (many students were from areas outside of Sapecho) or in Rurrenabaque, where there was a school that trained professional tour guides. I'll admit to helping more than a couple students with their English homework, a subject that seemed to be both common and popular among students of primary and secondary school.

### **Indigeneity and Identity**

Indigeneity in Sapecho was complicated by a changing and ever-growing population. There was a core group - 23.3 percent- of Sapecho residents made up of first- or second-generation families, whose fathers or grandfathers, respectively, did not live in Sapecho. However, there were also many who live in Sapecho who are first-generation migrants, mostly from La Paz and Potosi, with smaller groups from Rurrenabaque (mainly students attending the agricultural college) and Oruro. The reasons for moving to Sapecho included coming as a *colonizador* (colonizer supported by Bolivian government and by aid agencies) [also called *colonistas* or *colonos*], as well as coming because of the climate, for work, due to marriage, or to study. Carlos noted that his parents had come to the area because of the drought in Potosi:

*Because of the drought, the crops were no longer producing well, hail, all that, the potatoes weren't growing, they had looked for a new life in this sector [Alto Beni] and they liked the weather here, everything grew here, especially produce, the land gave citrus, banana, cacao, yucca, you could always depend on the land, in Alto Beni you can grow any crops.<sup>9</sup>*

There was a large realization amongst those that came to Sapecho that the area as well as the community held a better quality of life, more opportunity, and more food/sustenance than other areas. Especially those who came from Potosi espoused this, as many were mine workers and detested the low quality of life and grueling labor which was common in the department. People in Sapecho were looking not just for a place to use the land up and then leave — they were looking for a new home and community apart from their humble beginnings. One development professional, Gerard, noted that Sapecho, unlike other areas within the region of Alto Beni, is a region where people have decided to permanently settle. In la Asunta, on the other hand, there is a more transient nature to the communities. “They are kind of camping in la Asunta,” he says, “because basically in la Asunta, what they want to do is have one crop of coca, produce that in the next three years and then their plan is to leave.” For Sapecho, however, there is a more long-term community, where people have potable water, want more projects, and are willing to take in migrants interested in the water system and in their good quality of life. Sapecho was growing, and growing partially because of the draw of access to WatSan (see chapter 6).

This community, therefore, was made up of a patchwork of many different ethnic groups—but most had one thing in common, a search for a better quality of life (both economically and socially) and a goal to own land and produce crops. To call Sapecho “indigenous”, however, would be disingenuous. While people largely hailed from regions which were home to indigenous groups, specifically Quechua and Aymara, the community at large did not have a strong attachment to the idea of indigeneity or their own indigenous groups. When asked directly if people identified with indigenous rights movements, 27.5% said they didn’t identify at all, 19.5% identified a small amount, 19.6% a moderate amount, 14.5% a large amount, and 15.2% identified completely (see figure 10).



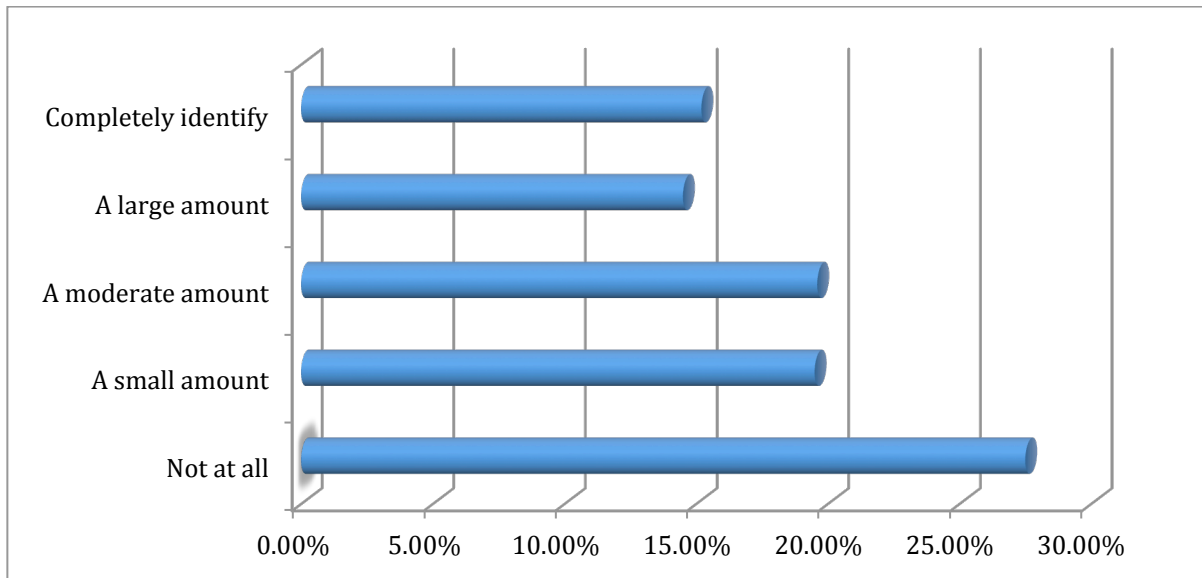


Figure 10: Do you identify with Indigenous Rights Movements?

Issues that would be construed, at least by the western academy, as indigenous issues, got very little play in Sapecho, and many people specifically rejected indigenous rights paradigms and indigenous identity. When protests and movements came on the TV at lunchtime, people barely looked up from their soup. The only real indicator that people were paying attention was the fact that the channel had been changed from football. No one I spoke to reported being involved with indigenous protest movements, although some did identify with those fighting for their indigenous position. I attended and participated in a local parade for La Paz' Independence Day. During the celebration, several examples of a new emergent identity for the people of Sapecho emerged. From my fieldnotes:

*At night there was a big march through the plaza. I went over to get something to eat at one of the shops that had invited me over specifically for the evening. She was roasting chicken and meat on an outdoor charcoal grill, and had cheesy rice—a Bolivian specialty. Anyway, I was on my way there when we passed a short clump of people marching with big Bolivian flags. Everyone was in western wear, but they were carrying*

*torches and flags and were asking people to join. Some joined in, some didn't. One of my respondents called for me to join up, so I did—somewhat timidly and toward the back. He came back to walk with me, and we continued around the main part of town (there are really only 4 streets, so we circled the first two and that was about it). It was so dark, but the torches were bright—and every minute-or-so the person at the front of the column would shoot off two loud firecrackers from his hand. Boom boom. The sleepy little town seemed to shake with the sound, oddly ringing out over the sounds of people playing with their children, buying vegetables, hocking meat, slurping soup. The march seemed festive and proud, but somewhat tired. Women with long black braids walked slowly, herding children in. The front of the column, so crisp and orderly with the flags and the torches and the straight-backed representatives, gave way to a snake-like tail of followers, thinning, full of people just straggling or half-heartedly rushing to keep up. Hunched and sleepy. But still glad to be there. And proud.*

*The procession stopped on the municipal building side of the plaza, all the marchers stopped in the street, and turned forward. Those with the flags lined up for speeches. A microphone was lowered from the second-floor window, and after a good five minutes and laughs from the crowd it started to work. People spoke about being proud to be a Bolivian, about the reason that people celebrate the day, about olden-day heroes. Then speeches were invited from the crowd—the first was more of the same, then a pause. A man clad in a button-down shirt, sweater-vest, and kakis with a baseball cap ran inside the municipal building, and came back out wearing Aymara garb. A long awayao tunic-vest, a jaunty hat. A cloth head-covering. He was older, had graying hair and harried speech. I couldn't understand the Aymara, but I was being respectful. The guy next to me turned, asked us if we spoke Aymara—"no, we whispered, do you?" He laughed, said "no"—to the guy next to him—"do you?" "no." They started to laugh. Giggling now.*

*I couldn't help but ask if anyone here did—and he said no, only the old people. Seemed like many were having similar conversations—the man had lost the audience, although many did half-heartedly chime in “hallalla” – “que viva”, both of these mean “cheers,” kind of, like “thumbs up.” Like “long life.” People knew that word. And they were respectful enough to respond, if not to pay attention. The man finished to luke-warm applause, ran back into the alcaldia, and came back out in his western wear again—looking wholly transformed. Back to his baseball cap and sweater vest. Back to facing forward and listening to the reports.*

The responses to the interview question: “What is your ethnic group, if you have one?” varied as well. Many people simply answered “no” to that question—and often a little bit brusquely. It was common that respondents followed-up their “no” response by pointing out “real” indigenous groups, such as the *Mosetenes*, who lived nearby. Others answered “mestizo.” Some responded with a specific ethnic group, such as Quechua or Aymara, and some claimed to be a descendent of Aymara/Quechua background. Some responded with a regional identity—“I’m more Yungueño”<sup>1093</sup> said Carlos—and Gerardo<sup>94</sup> answered “I’m a Paceño<sup>95</sup>, half Yungueño.<sup>11</sup>” Victor, answered more communally:

*None [no ethnic group], I'm Bolivian, this is the top for me, here you shouldn't name yourself with a group within a country, that you are this, or that, this divides us, shrinks us more, does it not? It is a bad thing. We're all Bolivian, and me, I identify as Bolivian.<sup>12</sup>*

This response was mirrored by many who I spoke to in La Paz—including friends, students, taxi drivers, and development professionals.. While responses differed within the community, one thing was clear—there was not a widespread indigenous consciousness, nor was there a

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<sup>93</sup> A Yungueño is a person from the Yungas región of Bolivia.

<sup>94</sup> As a reminder, all names in this document are pseudonyms.

<sup>95</sup> A Paceño is a person from the La Paz district.

specific ethnicity or indigenous group upon which people as a whole hinged their identity (whether it be personal or communal). Connections to history, space, region, and country were clear—but these aspects of identity outweighed any one indigenous consciousness.

For the people of Sapecho, being a colonista or an interculturale was a kind of identity, one both ascribed and adopted. While not all the people of the area were really part of the movement of colonistas, the town was widely regarded as a town of settlers. But for the people of Sapecho, unlike those who were outside looking in, being a colonista wasn't an entirely negative characterization. One development professional, Federico, argued that colonistas were a negative influence on the region of the Yungas, and characterized them as follows:

*And so, a part of our Nation they want to take over all others' [land and culture]. That occurs in the Yungas. The colonistas, who are a big group of people in the region [of Alto Beni], have imposed their customs, their ways, and have brought new traditions that have affected the original traditions [in the area]. In many cases, the earlier inhabitants may have adapted to the new practices, mainly in the consumption of alcohol, wife beating, things like that, and they did not preserve their cultural ways. Then in these places or regions where before the indigenous lived, these colonizadores have come and have thrown to the side, every time, the original inhabitants. And so this is something that I do not think is just.<sup>13</sup>*

Sapecho residents didn't see themselves as set out to take land or culture, or to impose their own customs, though. They were out to create a community out of people trying to get a new start. As Clara summed up:

*Colonos, colonos, before they said this, colonos or colonizadores, they said that. But now they aren't colonos, they're communities. At our agricultural plots they say those are colonias, and for this I'm a colono here, the people say this, but*

*now, in this day and age, it isn't that. We're communities now, it isn't just a settlement.*<sup>14</sup>

Not only is indigeneity conceptualized differently within Bolivia, the relationship between *colonistas*, *mestizos*, and people of indigenous background more broadly is changing in light of migration, relationships with western media and culture, and access to resources. Furthermore, not only were the people of Sapecho categorized as quasi-indigenous, they were also considered *colonistas*, and all that came with it. They were neither indigenous nor Spanish. They had negative connotations in La Paz and with many of the surrounding indigenous territories because of their status as settlers, but they also felt distanced from their original heritage. They didn't really feel that the government represented them, although the government often touted their support as *interculturales*—a term that many didn't even like. And yet, they were trying to make a community, a new one, with a kaleidoscope of traditions and practices. While it is easy for me to understand the community's point of view, their identity as a fledgling community of settlers, it is also important to point out that the other views of those expressed in LaPaz are just as valid. The community of Sapecho is located on land that is not ancestral to the people there, and the water that they are using is potentially being diverted from indigenous peoples. This is addressed further in chapter 5.

### **Transnational Human Rights**

Knowledge of Human Rights was not widespread, with 28.3% having no knowledge of human rights. Most of the respondents knew a small to moderate amount about the concept of human rights (55.1%), and with only 13.1% knowing more than a moderate amount. In order to address this in another way, I asked respondents if they felt that individual rights were more important than the rights of the community. The results were mixed, with 51.5% answering that they were more important, and 48.5% responding that individual rights were not more important than community-based rights.

From my ethnographic work, I found that people had a clear relationship with the concept of rights more broadly; professing that water was a right, as were other rights such as basic services. These rights they were speaking of, however, were more organic than those granted by the UN or other human rights organizations. The Bolivian government, the people themselves, and tradition all played into peoples' relationship with the idea of "rights." Rights weren't clearly a part of people being indigenous and they weren't parsed as UN-based rights—there was no one clear answer as to who gave, got, or was responsible for rights writ broadly. Throughout my work, I interrogate the idea of WatSan as a right, and in the following chapters I delve into rights frameworks and concepts that were generated from community responses. As an introduction to the community's position, however, I will say two things; first, that rights frameworks were not necessarily conceptualized based on transnational or western understandings of rights, and second, that the community spoke about rights in different ways (but largely to the same end).

### **WatSan and Identity**

These aspects of Sapecho residents' identity are not just relevant for the reader to understand the setting of their position in general; they continue to be relevant as we look at WatSan. Indigenous rights, the concept of Pachamama or "mother earth," comparative water practices, and relationships with the U.S. government, NGOs, and the government of Bolivia all hinge, in part, on this complex and changing identity on the part of the people of Sapecho. As this work continues, expectations related to class, ethnicity, gender, and rights will continue to mediate the ways in which people in Sapecho are expected to and actually do interact with components of WatSan development. Even if Sapecho residents were not fully allied with indigenous identities, traditional ideas about gender, social roles and mores, and community organization, did stem from indigenous practices, as did some WatSan concerns, such as relationships with Mother Nature (Postero 1995). WatSan workers, then, must both understand, but not assume, indigenous relationships with WatSan in the Alto Beni region. As shown in the

following chapters, some practitioners and residents are willing to critique and change indigenous practices related to water, whereas for others, cultural relationships with the land and with water sources predominate.

More broadly, the very motivations behind the colonization movement, which spurred the settlement of Sapecho, are arguably reflected in individuals' relationships with land and water in the area. The movement was meant to mask poverty and inequity in indigenous groups, to encourage capitalist agriculture, and to depopulate indigenous areas (Postero 1995:46-47). This again ties Sapecho to neoliberal ideas of development, beyond just those espoused by the U.S. and USAID. The very identities of the people of Sapecho, and the ways in which they act on it, have been constructed by a variety of practices and policies related to neoliberal governance and capitalist ideals. Perceptions of water quality, water practices, conservation expectations, and management schemes in Sapecho are festooned with an amalgamation of indigenous, capitalist, and westernized viewpoints. In order to truly understand WatSan in Sapecho, and in Bolivia more broadly, one must appreciate the complex nature of identity, and the wide range of ways in which it is expressed in the community itself. There is a reason why a political ecology approach prizes historical and social context, and this study exemplifies the ways in which several socio-historical components affect WatSan use.

Sapecho, notably, has benefitted greatly from development approaches which focused on indigenous and coca-growing regions, and they certainly are housed within a region that is both. However, the community, specifically, identifies as neither indigenous nor coca-growing. Thus, their relationship with aid agencies, the government of Bolivia and the government of the United States, and with WatSan as a whole, differs from other areas. This makes them somewhat distinctive in the region, and provides some fodder for dramatic irony in looking at both rights and development.

## Transition

To be fair, water and sanitation, with its wide-reaching nature, can impact every realm of society. Introducing the structures which govern WatSan, addressing the ideals from which these projects are forwarded, and understanding the context (both political and social) where the WatSan system is placed, is central to understanding the impact of the system on local practices and ways of life. In the following sections, I address these impacts. The ubiquity of WatSan processes makes bounding the reach of this work difficult as WatSan infiltrates most components of human life. The next three chapters look at three main theme areas in order to present the relationship between community, WatSan, and development: 1) Water Use and Water Conservation, 2) Politics of Equal WatSan Upkeep, and 3) Sanitation, Sewage Collection and Wastewater Treatment. Each of these themes is presented as a chapter, and each theme encompasses necessary aspects of the WatSan process that must be recounted. The section on water use and conservation covers the ways in which people utilize water, their perceptions of it, and the ways in which use practices are mediated and constrained by conservation ideals. This chapter covers the amount of water used daily, what people use water for, and the ways in which water practice stems through everyday life. The section on politics of equal upkeep focuses on how water is managed, how it impacts certain groups, and potential issues that the water managers in Sapecho may face in the future. While each of these chapters focuses on sanitation in part, the chapter on sanitation, sewage collection and wastewater treatment delves deeply into theorizing, explaining, and addressing concerns that arise specifically from this aspect of the infrastructure.

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<sup>6</sup> “Pisa tierra... en contacto con la naturaleza, las formas de vida, las plantas, el ambiente, el medio ambiente”

<sup>7</sup> En Sapecho...en lo que he visto, yo soy muy conservativa, que se van igual, se van temprano a trabajar, y no regresan, igual, hasta las 5, 6 de la tarde, 6 de la tarde están volviendo todos y bueno esperan la cena, que su esposa va a hacer. ...y luego duermen, esa es su vida...y rara vez hay cosas que bueno para divertirse, digamos una feria, o algo especial en el colegio, invitan y todo el pueblo se va



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ahí...después no hay...por la noche si se va a dar una vuelta porque el aire está más fresco y caminar un poco...porque en el día no se puede.

<sup>8</sup> Generalmente aquí las mujeres son amas de casa nomás. Amas de casa, siempre la comunidad es un poco machista, la mujer está ahí.

<sup>9</sup> Por la sequía, los cultivos ya no producían bien, la granizada, todo eso, las papas ya no daba, ellos han buscado nueva vida por este sector y les ha gustado el clima aquí, todo produce, todo produce, da cítricos, da banano, cacao, sandía yuca, depende de que uno siempre, Alto Beni, da todo los cultivos se adapta.

<sup>10</sup> Yo soy más yungueño.

<sup>11</sup> Yo soy paceño, medio yungueño.

<sup>12</sup> Ninguno, yo soy boliviano, ese es mi principio de mí, aquí no debería de nombrarse dentro de un país, que tu eres esto, o esto, eso nos divide, nos achica más, ¿no es cierto? Está mal, todos somos bolivianos, y yo me identifico como boliviano.

<sup>13</sup> Entonces una parte de nuestra nación quiere sobreponerse sobre todos los demás. En los Yungas ocurre eso. Los colonizadores, que son la gran masa de personas, han impuesto en la región sus costumbres, sus formas; han llevado nuevas tradiciones, las cuales han afectado a los originarios. En muchos casos, muchos originarios se han adecuado a eso, principalmente en el consumo del alcohol, pegar a la esposa, cosas así, y no están conservando su propiedad cultural. Entonces a lugares o regiones donde antes vivían los originarios han llegado los colonizadores y los botan cada vez más a los lados a los originarios campesinos. Entonces eso es lo que no me parece justo.”

<sup>14</sup> “Colonos, colonos, antes así hablaban dice, colonos o colonizadores, dice que, pero que ahora ya no son colonos, son comunidades. A sus lotes decían colonias, por eso yo soy colono de aquí, así dice la gente, pero ahora en hoy día, ya no es eso, ya comunidades ya son ahora, todo ya no es colonia.”

## **CHAPTER 5:**

### **WATER USE AND WATER CONSERVATION**

This chapter seeks to apply a political ecology (PE) framework to analyzing WatSan choices and to use emergent themes from the study of these choices in Sapecho, Bolivia, to elicit and explain PE critiques. This chapter is divided into two sections: water use<sup>96</sup> and water conservation.<sup>97</sup> In part 1, I focus on the ways in which WatSan systems' implementation influences water use. Many individual water use practices are assumed, such as drinking, bathing, washing clothing, cooking, cleaning, and flushing. However, the ways in which people use water for and during these practices varies by culture and situation. The type of infrastructure implemented in a WatSan system, (from individual spigots, shower/baths, sinks, and kitchen hookups), not to mention the addition of flush toilets and centralized sewage removal/collection (which requires water for flushing), changes the amount of water used as well as the ways in which people view that water's use. In Sapecho, several enviro-social factors mediated peoples' use of water from the water system. This change in use, in and of itself, is a ripe area of ethnographic study. Beyond this, however, as both the NGO and many in the community were concerned about conservation of water, the ways in which policies were implemented to ensure conservation further complicated peoples' water use practices. I address these tensions in part 2 of this chapter. The questions of who was in a position to make decisions about conservation practices, the ways that these choices were made, and the context of these choices at several different levels of the WatSan process had a distinct effect at

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<sup>96</sup> For the purposes of this chapter "water use" refers to water withdrawal for household purposes and consumptive use, including sewage collection use.

<sup>97</sup> For the purposes of my work "water conservation" is defined, as by Baumann et al. as any practice that promotes "socially beneficial reduction in water use or water loss" (Gleick 2003).

the individual level in Sapecho, especially for certain marginalized groups. Balancing water use changes and water conservation perspectives, all while absorbing and managing a new WatSan paradigm, can be difficult for communities. However, looking at the nuances of these practices can assist WatSan practitioners in addressing issues related to both water use and water conservation, and can help to marry and synergize these practices at the community level. A PE framework here provides focus on power relationships, human-environment interactions, wider waterscape and systemic concerns, and levels of influence in this focus area.

I raise four main themes throughout the chapter's discussion:

1. The placement of WatSan systems gives power to certain groups, changes use practices, and inevitably causes environmental effects.
2. Practices related to water use are mediated by the perceived and actual cost of water from the system, the type of sanitation system implemented, and the availability of traditional sources of water (the river).
3. Metering of water, implemented by the NGO and water committee to encourage conservation practices (less water use, payment for source protection and procurement, and payment for deforestation awareness campaigns) further complicates water use changes and can ingrain water inequality.
4. If the human right to WatSan is to be achieved, a political ecological look at unexpected effects of WatSan cost and conservation needs to be encouraged.

### **Neoliberal Models of Development and Water Use Issues in Bolivia**

Neoliberal development through NGOs, while very much the paradigm in Bolivia over the past two decades, has been widely criticized from an environmental point of view.

Neoliberalism has been linked to environmental degradation, referred to by some as the “neoliberalization of nature” (Bakker 2007: 432, Perrault 2007). Stressors related to the finite nature of water resources, for example, forward cost-based management of water sources and privatization initiatives (Hailu et al. 2012, Mulreany 2006, Spronk 2007). These pressures have been particularly stark in water-poor<sup>98</sup> areas such as Cochabamba, Bolivia (Albro 2005, Assies 2003, Davis 2008, Olivera 2004 Wutich 2009a, 2009b, Wutich and Ragsdale 2008). Until the

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<sup>98</sup> As in lack of access to plentiful water resources.

1980s, WatSan utilities in Bolivia were largely unregulated. In 1992 the types of water systems available in new areas were restricted (to only metered water connections) and in 1999 public sector companies went private and decreased public water access points and unmetered water connections even further (Komvies 1999; Lee 2003:286). Bolivia's La Paz standards for water regulation started to drive the idea that "metered in-house water and sewer connections are the only acceptable types of service" (Lee 2003:286), and these opinions were reflected in other areas of the country. The western, metered water model continued to serve as a landmark for other systems, although these systems have been largely nationalized at this time due to public backlash. Thomas Perrault notes, "new institutional *and* organizational forms of environmental regulations have emerged in the context of Bolivian neoliberalism," and points to the mercantization of water<sup>99</sup> (drawn from Bakker 2002), privatization, and restructuring of management (2005:268). The metering of water has gone largely unquestioned in Bolivia, and yet the price-for-water-use paradigm is particularly problematic in a country where privatization has been so very negative, even in systems that are "community run," as in Sapecho.

In Bolivia, specifically, choices about who gets water are highly political and are related to coca non-proliferation, U.S. government goals, and Bolivian government relationships with local communities (as was detailed in chapter 3). These WatSan development choices are not value free, they are not inherently beneficent, and they cannot be assumed to provide a net-positive for all individuals within a WatSan project area. Giving the power inherent in access to WatSan to certain groups and not to others creates ripples both socially and environmentally. In this case, while Sapecho benefitted from the WatSan system, other nearby towns did not.

While all lived in a seemingly water-rich area, with high rainfall, lots of rivers, and a tropical

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<sup>99</sup> Mercantization of water refers to a suite of influences on water use and management which are related either directly or indirectly to market-based approaches; this has also been linked to sewage collection and wastewater treatment management and choices. Mercantization specifically refers to the changeover from public to private management paradigms, even if not specifically "privatized"—this means that market-based approaches and commercialization of water management would be likened to a mercantilist approach (Bakker 2002).

climate, WatSan infrastructure and conservation—not the existence of water only—was the divider between the “haves” and the “have not’s”. Development agencies, even prolific ones, cannot often ensure that all have access to water in a certain area due to funding, topographic, and community layouts (e.g., if one family lives far from the system implemented, it is difficult to get that family water). This lack of inclusion, while negative, is expected. Unexpected inequality and lack of inclusion for those who do gain access to water through WatSan development is more difficult to parse, especially when this marginalization is related to cost for water. The main point of implementing a WatSan system is so that people can use it and benefit from its use. A human right to WatSan approach, or human rights-based approach (RBA) would both require ensuring that people have access to their rights, and ask that achieving those rights be a clear focus of development (Filmer-Wilson 2005). Thus, if changes in water use because of the way a system is managed hinder beneficial effects from WatSan development, there is a clear block to the realization of rights at the individual level.

WatSan issues are parsed as human rights but then are privatized, centralized, or commoditized in the Bolivian setting (Johnston 2003:90). Individuals’ willingness to pay for water may be impacted by their understanding of a “right” to water; if it is a “right,” many think it should be free (Derman 2005). Meters and other tools implemented by NGOs in order to ensure sustainability of water sources may clash with individual use “rights”. Additionally, the implementation of these rights may be classed, gendered, or imbalanced such that the provisions prop up current structural and power systems in Bolivia, rather than rectify them. Furthermore, while rights to WatSan may be dictated by the international community and the Bolivian government, where do citizens go to ensure that these rights are appropriated? Richard Wilson (2008) argues that the construction of rights is fragmented and imbalanced, Patrick Ball reminds us that the nature of and the actions surrounding rights can be influenced by individuals and by NGOs (2008:77), and Stammers (1999) argues that these constructions of

rights themselves can be power-laden, especially in nationalist settings. The human right to WatSan in Bolivia is constructed by several actors and is a discourse used by several different powers for their own motivations and aims. It is key to remember that accessing the right to water is contingent on NGO and nationalist positions, especially when critiquing the ways in which very programs, policies, and infrastructures that these entities put into place constrain and deny rights even within WatSan-accessible environments.

### **Part 1: Water Use**

The types of water use in residential settings include toilet water, laundry water, kitchen water, miscellaneous water, and drinking water (categories from Lee et al. 2012 with the addition of drinking water by author). In Lee et al.'s study in Korea, toilet water took the most water use<sup>100</sup>, with laundry, kitchen, bathtub, washbowl, and miscellaneous water following (2012:461). While my study does not specifically measure the exact water use of individual households, it provides an ethnographic account of reported use of water as well as cultural practices and situations that affected water use (including water used for sewage collection).

Peter Gleick discusses how cultural influences can relate to how much water is appropriate for sanitation (2003:278). Furthermore, he parses out the differences between use, need, withdrawal, demand, consumption, and consumptive use. These definitions give cultural reference, allowing for the fact that cultural differences may change the amount of or availability of water for certain uses, which is a necessary focus. I rest on his terminology and their definitions. Briefly, water use is divided into water *withdrawal* (water used for human need that could be returned to the waterscape, and *consumptive use/consumption* refers to irretrievable/irrecoverable loss of water (evaporation, contamination). Gleick addresses the differences between water *needs* (e.g. for basic for personal use) and water *wants* (e.g., for

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<sup>100</sup> Flush toilets, notably, take more water than is necessary for waste removal, and are often the most water-hungry piece of infrastructure in a household, accounting for most of the water used (Lee 2012, Gleick 2003).

treatment of waste) (Gleick 2003). Reasonably decreasing consumptive water use and limiting water “wants” can truly “save” water, whereas water withdrawal and water use can be addressed through reuse foci. Water use from system infrastructure for irrigation as well as industry is categorized as being a “want.”

### **Zooming in On Sapecho: Setup for Water Use**

The process of implementing WatSan in the community of Sapecho itself, far from being a simple “gift” of WatSan infrastructure between NGO and community, was a process which came at fiscal and physical cost to individuals. At the household level, access to water from the water system was contingent on a series of actions and provisions, all of which came at a price.

First, the community member had to have water infrastructure on their property, which they paid for. Water infrastructure at the household level varies from a single outdoor spigot, to outdoor bathroom and sink, to full indoor bathroom with a shower, sink, and kitchen sink — whatever the household can afford (approximately \$4,000 bolivianos was a rough consumer-reported average). This translated to a variety of different household-level infrastructure setups, most commonly an outdoor structure that housed a flushing toilet, shower, and an attached multi-purpose sink. Most common was an outdoor water hookup very near the road which consists of a small hut which had a toilet, shower, and sink for filling cooking pots and washing clothing and dishes.<sup>101</sup> (see figures 11, 12, and 13) Access to the sewage and sanitation system was an additional cost, and while most who were there at the time of the WatSan system implementation joined the sewage system network, some kept their old latrines rather than pay for toilets.

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<sup>101</sup> Why near the road? The pipe is expensive, and the closer you are to the communal water system pipe the more likely you are to save money on infrastructure on your own property. People with higher income had a full bathroom inside their homes, and even an indoor kitchen sink or second spigot. Some people with lower incomes had only a spigot on their plot, without a shower or sink.



Figure 11: Shower  
Sapecho, Bolivia 2012  
Photo by Maryann Cairns



Figure 12: Washing Sink  
Sapecho, Bolivia 2012  
Photo by Maryann Cairns





Figure 13: Tap Stand  
Sapecho, Bolivia, 2012  
Photo by Maryann Cairns

Second, community members had to either participate in the construction of the system (through a counterpart of days of work) or buy into the WatSan grid in the area. Adding to this, for many individuals, this process of work and payment was completed not once, but twice, as part of the megaproject. Many families have plots up in the smaller communities reached by the WatSan system, and paid for the installation of spigots at their agricultural plot as well as at their household.<sup>102</sup> Finally, after all that was handled and the WatSan hookup put into place, the individual household had to pay their water bill each month. For households in Sapecho proper (excepting Brecha A and 29 de Septiembre (see chapter 4)), water was billed through metering. For households outside of Sapecho proper (but still along the megaproject line and effective

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<sup>102</sup> Cost of sewage collection network and complex in-home infrastructure in these cases were not duplicated.

part of the Sapecho community), water was not billed through metering, but instead at a flat fee<sup>103</sup>.

### **Household-Level Use Practices**

Water use practices on the part of the community were mainly at the household-level. Marcelo's description of how his household uses water is representative of a major part of the population:

*I use water first for the kitchen, we say, for food, and the second is for personal use, the shower, the toilet, the bathroom, and washing clothes daily, too. That is how it is normally used, in my house, and here it is about the same, right? A lot of us use it this way.*<sup>15</sup>

These use practices align with those presented by Lee et al. (2012) and Gleick (2003) as discussed above, and include both practices which could be considered "needs" and "wants." Notably, using the water system water for irrigation was forbidden, and people followed the rules. This was in part due to the fact that, traditionally, people did not irrigate, but instead used rainwater or, if necessary, water from the river carried in buckets. Finally, people did use system water for washing cars. This was widely despised but it happened; I saw it often enough, and heard people who did so maligned enough, that I am confident it was common but looked at unfavorably.

### **Women in Water Use**

Women were widely regarded as more responsible for the household-level tasks related to water use, especially washing clothing, cooking, and bathing children. Jhosselin noted this

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<sup>103</sup> Again, at times individuals who lived in these areas may have had two hookups, one at their home and one at their agricultural plot, compounding the cost of their overall water use.

difference in our interview, saying “frequently the women, we use [water] to clean the house, for the bathroom, to wash clothing, all of this, on the other hand the men they use [water] to bathe themselves, and once in a while when they wash clothes, too.”<sup>16</sup> From the surveys, 91.3% of respondents said that women were more responsible for duties surrounding water use in the home (see figure 14).

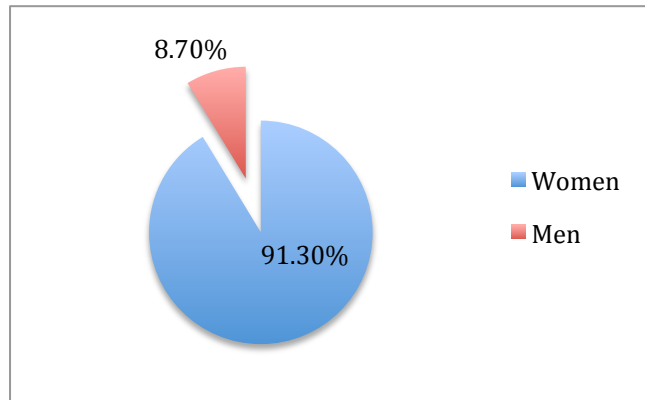


Figure 14: Who is more responsible for household level water tasks (e.g. cooking, cleaning, washing) men or women?

This reflects the work of other scholars who have found the same gendered use practices, especially in rural areas in the developing world (Allen 2006), and in Bolivia, specifically (Wutich 2009a, b).

### **Culturally-specific Use Practices**

While water use categories were as expected from the literature, some *practices* related to water use were not what I expected. In the case of Sapecho, choices related to water use were based on environmental, social, and cultural factors. Use behaviors were different from those in more western contexts in some key ways. First, people often shower three times a day because of the oppressive heat, and this is not seen as a waste of water. Second, individuals supplement drinking water with eating large amounts of citrus fruits (which are cheap and homegrown by most individuals). Through participant observation, I found that it was not uncommon for people to eat 11 or 12 mandarins in one sitting, especially when they are working

in the fields. Third, individuals also drink more water due to hard physical labor, with respondents reporting drinking up to 5 liters of water daily. Fourth, while, as noted earlier, people did not irrigate with system water, they did occasionally use water from the system for their gardens or for seedlings.

### **Traditional Water Use and the River**

The use of river water was an acceptable water source for more “wasteful” practices such as car washing. Beyond this, however, a portion of the population often used the river for bathing and washing clothing. There were two reasons for this. First, there was cultural meaning around the river’s water. People bathed, washed clothing, and gathered drinking and cooking water from the river historically and traditionally. Because of this, the river used to be a social space. With the implementation of the WatSan system by USAID, this social relationship with the river stopped for many, who began to use the system’s water exclusively. However, for others, it remained a social sphere. I found partially, as did Dale Whittington et al., “In rural areas many of those ‘served’ by new systems have chosen to continue with their traditional water use practices” (1990:293). I spent some delightful days at the river with families, bathing, washing clothes, and splashing about. Still, while for some river use was voluntary and partial, for others it was less a social choice and more a financial necessity, in that it was a way for individuals to not pay for but still access water. Those who could not or did not want to pay for additional water use gauged through water metering went back to the river for bathing and washing, and sometimes even cooking.

The problem is, the river was a much lower quality water source for bathing and washing than the water system, and was certainly more risky for ingestion. The water was rife with contaminants, and many reported fungus, skin infections, diarrhea, and other negative health impacts from their use of the water there. Still, people perceived the river’s danger to human health in different ways. When a key informant in the study was washing her clothes, I asked

her directly if she thought the water was contaminated, and she said it was not, even though I could see the fungal infection on her feet as she said that all was well. The town doctor corroborated that the river was a source of skin and intestinal infections in our interview:

*Maryann: Do the people still use the rivers here in this area?*

*Dr. Horatio: Yes, yes, and thanks to this we still have a bit of a high number of cases of diarrheal disease. And not just in the kids, it still exists in the adults, because there are still people that go to wash their things or to bathe themselves, and by bathing they don't just get diarrhea or gastrointestinal infections, they also get skin infections and other things [that have come from the river] that I've been watching.<sup>17</sup>*

Some residents wouldn't even touch the river because of the contaminants. I did because it was part of my research, but I was a little nervous about it. I was quite sick due to antimalarial medication, and thus it was hard to say whether or not I was also affected by the river water. Garbage was often dumped in the river as well, both because this was a traditional disposal method and because garbage collection has halted in the area.

Thus cost, need, and sometimes tradition pushed some individuals back to this water source that contained pathogens. Assessing the willingness to pay when alternate options exist has been of increasing concern since the early 1990s (Gadgil 1998). In Sapecho, the river was a pressure valve for people who couldn't or didn't want to pay for the water from the water system, but it was also a cultural space (see figure 15). Tensions between metered water payment, system water use, and river water use continue to be of central concern throughout this chapter.



Figure 15: Family washing clothing at the river.  
Sapecho, Bolivia 2012  
Photo By Maryann Cairns 2012

Traditional water use practices were both changed and, for some, re-ingrained by the implementation of the WatSan system. Through part 2 of this chapter I address the ways in which water conservation pressures hinged these relationships with water and the ways in which NGO-proliferated WatSan use ideals and policies foiled the benefits of the WatSan system for a portion of the population of Sapecho.

## **Part 2: Water Conservation**

*“People [in Sapecho] aren’t preoccupied with water, but they are very preoccupied with conservation.”*

-From my fieldnotes

Conservation wasn’t originally a focus of my study. Conservation as a key area of analysis and exploration here was truly a product of an ethnographic approach and grounded-theory analysis. Conservation was a clear and recurrent topic of discussion on the part of interviewees, with 132 coded sections including the sub codes of metering, development as

conservation, water source procurement, and deforestation. Often, discussion related to conservation occurred when I asked if there was anything else I should know or discuss about WatSan in the area, or part-and-parcel with discussions of *Mother Earth*. There was no one group or agency that forwarded an understanding of conservation in Sapecho; instead, foci from a mélange of agencies and levels impacted conservation pressures. From my research, it was clear that the perspectives of the development agency personnel from ACDI/VOCA and USAID who implemented the WatSan system, Bolivian laws (protecting the environment, water, and the idea of Mother Earth), personal relationships with the idea of “*Pachamama*” or “Mother Earth”, NGOs operating locally (such as Banabeni and FONADAL), local business focus areas (such as deforestation and source protection at El Ceibo), and clear and present examples of what happens when conservation isn’t forwarded (such as water scarcity seen in Palos Blancos and Cochabamba) all conflated to create a ripe conservation consciousness in Sapecho.

There was, however, a specific set of actors who made the choice as to what conservation initiatives to implement in Sapecho related to the WatSan system. These choices were a product of NGO policies and individual, agent-based decisions on the part of water committee members (albeit influenced by this wider conservation consciousness fostered in the area). However, as Irit Eguavoen notes, “water use and allocation can also manifest as ad hoc processes” (2008:5). People in Sapecho weren’t just passive recipients of these policies; they actively resisted them in ingenious and culturally-specific ways. Fry et al. (2012), found that indeed water supply could decrease in the Alto Beni region as a response to climate change more than agricultural practice, and recommended conservation and less water-intensive sanitation practices as potential ways to address this concern.

### **Political Ecology, Water, and Transnational Governance**

Conservation has continuously gained interest from the western social audience (Vaccaro et al. 2013). Through neoliberal policies and neoliberal-based development practices,

it soon became the place of NGOs to ensure conservation of water resources used for WatSan development. Conservation and the right to development have been tied together (Vaccaro et al. 2013, Sachs 1999), and within this broader discussion monetary incentives for conservation have been both lauded and criticized (Borgerhoff and Coppolillo 2005). While in development the overall consensus has been that human use takes some marginal precedence over full conservationist ideologies, and while many have argued that local people have a right to pursue better livelihoods even if it requires the nonsustainable use of land and water resources (Postero 2007), western-led development has still prized and taught conservationist approaches.

Development professionals in my study did see the development process as a good way to forward conservationist ideals. Gerard stated that WatSan development is a “great opportunity to work on other topics like environmental leadership apart from water and sanitation” and Federico argued that:

*They may have knowledge, but culturally they aren't prepared [to handle the system]. We teach this over two years...the water is immediate, water comes and everyone is connected, the problem is how we use water. So, for example “I have a tap in the yard, and I open it and let it squirt out, no matter” –then I'm not culturally ready to use that service. I'm not aware of my microclimate, so until that happens I have to spend some time [to learn].*

The development professionals don't see this misuse as purposefully careless, but instead as a lack of knowledge. Giving people a consciousness about conservation is a goal of agencies due to their care for the environment, but the ways in which specific policies are meant to care for that conservation ideal proved to have unexpected and lingering effects.



In the development process, NGOs taught conservationist ideas and practices to local communities or community boards in order to steward the environment and encourage sustainable behaviors. Communities were taught how benefit from, while still conserving, the environment. The ways in which communities absorb, enact, and resist these policies shine light on the ways in which conservation and human use connect and clash.

But, as scholars, we must be careful to ensure that marginalization and exclusion are not byproducts of development campaigns, especially when lack of access to WatSan resources – the very driver for development in the first place – is a possible outcome for certain sectors of the population.

Broadly, water and sanitation systems are designed with an eye toward sustainability, both in the long-term viability of infrastructure and the continued care and procurement of a natural resource – fresh water. Projects, then, are not only designed to manage and protect infrastructure, they are also implemented with an overarching requirement to ensure conservation and stewardship for the environment.

In Bolivia, specifically, this is important. Laws governing water use and sanitation practices, especially regarding sewage removal and effluent, are clear. The rights of Mother Nature are imbued in the laws of the state, and Mother Nature has humanlike recourse for affronts against her (Bolivian Law 071). Still, little consensus surrounding (or even widespread attention to) this mandate is evident. Laws are widely flouted, , and pollution of natural waterscapes is a recurrent and urgent issue in several parts of the state (Bustamante et al. 2004, Farthing Nd). As transnational governance through NGOs and other extra-state forces starts to encourage, regulate, and ostensibly balance the human and ecological outcomes of the systems they implement, they become the guarantors of both human and environmental benefit. However, their abilities to ensure this are limited if their policies and programs are having unintended, unexpected consequences which delimit these human-environment relationships.

## Conservation Choices

USAID, ACDI/VOCA, and representatives from the community agreed on three main issues related to conservation in Sapecho's Water System:

1. Stop water waste: in order to stop people from wasting water in their homes, residents were encouraged to conserve water.
2. Protect the water source: The community was encouraged to protect the water source by stopping deforestation and fencing off/maintaining water sources.
3. Ensure adequate water in the long-term: The community was encouraged to seek out new sources of water in case of potential shortages in the future.<sup>104105</sup>

One of the main ways that the water committee sought to address all three of these concerns, with the assistance of the development professionals implementing the WatSan system, was to have the people of Sapecho pay for water by the amount of water they used. This choice, theoretically, addresses these needs. As people pay by use, they are less likely to waste water, since this would be a waste of money. The money would also, ostensibly, help the community ensure their ability to protect the water source and ensures their ability to gain access to new water sources in the long-term.

Unfortunately, the implementation of metering did not meet its goals. While metering did encourage people not to waste water, it also had negative impacts for certain groups within the town of Sapecho. While it did make people pay attention to water waste (not leaving the tap running, for instance) it also did not necessarily encourage true conservation behavior (such as water reuse), but instead pressured people to return to the river for bathing and washing clothing. This both lessened the benefit of the WatSan system for individuals and failed to truly

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<sup>104</sup> Current water was overall very sufficient, even plentiful, in the area, save for a short dry season. Four springs fed the water system.

<sup>105</sup> The NGO's choice of a centralized system with centralized sewage removal and, especially, wastewater treatment, can also be characterized as a conservation choice as it addresses the needs of the watershed as a whole and seeks to minimize environmental harm and water loss to consumptive use. However, this was an implicit choice in the infrastructure, and not an explicit request of the NGO on behalf of the water committee. The use of water for flush toilets is addressed here, but the wider infrastructure-embedded conservation choice of wastewater treatment is discussed further in chapter 7.

affect its main aims: conservation of water and increased revenue for the committee.

Furthermore, the metering scheme failed to collect enough money so that the water committee had sufficient funds to stop deforestation, buy more land, or buy more water sources.

Beyond the initial choice to implement a water system, conservation decisions in Sapecho had unexpected impacts on certain portions of the population, and wider conservation practices driven by the need to sustain the WatSan system had wide-reaching impact. The very choice to put a water system in a location already prizes a specific community's water needs, and may be seen as marginalizing the needs of individuals in other areas of the watershed. As I will show, adding conservation pressures to the mix continues this process of power, creating inequity both within the community and outside of it. This power is articulated in the choices about who is deserving of new water and sanitation infrastructure, choices which were led by NGOs and contingent on US-based political aims. This is especially evident as the use of a WatSan system requires the enclosure of a "commons resource" (in this case water) and "redefinition of the value of those resources" (in this case metering and water payment; Johnston 2003:76). The remainder of this chapter focuses on how conservation led to water metering practices and the effects of these practices, and then focuses on wider conservation ideas and their potential impacts on the region as a whole. I conclude this chapter with a discussion on political ecological tensions between conservation and use.

### **Metering and Use**

One of the main objectives of water metering is to ensure that water sources are conserved for future use (Udea and Moffatt 2013). The goals of metering go beyond this as well, ensuring that environmental landscapes are preserved, that water projects and programs have sufficient funds to continue, and to ensure that "economic incentives" change individual behavior related to water use (Khawam et al. 2006, Udea and Moffatt 2013). In metering, we see a monetary answer to conservation initiatives that is tied at once to the long-term efficacy of local

WatSan systems and to the long-term conservation of local water sources. The responsibility for WatSan and payment is quickly shifted from the development organization to the community, and long-term upkeep of water systems becomes requisite on individual payment for water use. While in the first world studies have found that metering does not cause negative impacts to local households (Dresner and Ekins 2006), that does not necessarily extend to third-world settings.

**Sapecho-Specific Metering Practices.** In Sapecho proper, individual households paid for water based on their water withdrawal for consumption. This metering was seen as a way to care for the system and encourage water conservation at the individual level. As Alejandro notes:

*All of us have meters. We are the only ones in the region that have meters in our water system. Because of this, we manage the system [better]—if there is a break in the line [and water is running], it is easy and quick to fix. The people call the operator and we fix it. Because, if you don't [let the operator know] your costs will go up. When you don't have a meter, the people aren't that worried about it.<sup>18</sup>*

Household-level withdrawal was gauged with a water meter. Each household had a “right” to a certain amount of water -- 8,000 cubic liters per month. For this, they paid 10 bolivianos a month.<sup>106</sup> The cost of sewer connection was 7 bolivianos a month. That didn't include the cost of the water used to flush the toilet; this was part of the metered water use. At the time of my pilot study, people paid 1 boliviano a month for garbage pick-up, but that had ceased by the time I began my full dissertation research. Over and above the 8,000 cubic liters, individuals paid a cost of 1 Boliviano per 1,000 cubic liters. Development professionals in Sapecho working with USAID/ACDI/VOCA had done a study which found that 8,000 cubic liters was appropriate

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<sup>106</sup> \$10 bolivianos was the base fee for water, even if people used less water than this, they had to pay the \$10 each month. Using less than 8,000 cubic liters was rare. No one reported using less than this in the interviews, and most participants went over the 8,000 cubic liter/\$10 boliviano allowance.

for household-level consumption, based on approximately 80 liters per day per person, but this was in areas that were colder than Sapecho. Ronaldo, one of the development professionals, found that “in the area where it is hot, Sapecho, Palos Blancos, in the [Alto] Beni” instead of about 80 liters a day per person, people needed about 150 liters. In Sapecho, then, it followed that the 8,000 cubic liter base was potentially too little, especially for larger families (the original base was calculated based on the needs of a family of 4-5). The average cost of water (only water, not the allied costs of sewage collection and garbage) within Sapecho proper was approximately \$28 Bolivianos per month<sup>107</sup> (n=113). Individuals who lived outside of Sapecho proper (in Brecha A or 29 de Septiembre) paid an average cost of 11 Bolivianos per month, with a mode of \$10 Bolivianos (the flat fee) (n=23).<sup>108</sup> The cost for Sapecho residents was higher due to metering practices, with only 23.5% of the households paying the low rate of \$10 Bolivianos, although use needs and practices were similar in both areas.

Focusing on the community spatially, it was clear that water costs were higher in the commercial and more central residential areas of Sapecho proper (where water metering was implemented) than in the outlying areas. The heat maps below (figures 16 and 17) generated with Google fusion tables from my data and corresponding GPS points, show the concentration of water cost (in red). Costs were high in Sapecho proper, which for some, translated to financial hardship. While a large portion of the respondents from the area said that paying for water was never a problem (60.2%, 68 people), 13.3% (15 people) of respondents said that it was rarely a problem, 20.4% (23 people) said that it was sometimes a problem, and 6.2% (7 people) said it was often a problem (see figure 18).

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<sup>107</sup> One outlier was removed from the data as a rare occurrence (based on industrial consumption). I'll also note that the sample size for those outside of sapecho proper is not robust, and thus this measure is more exploratory than anything else.

<sup>108</sup> Three individuals reported costs over and above 10 Bolivianos for unknown reasons.

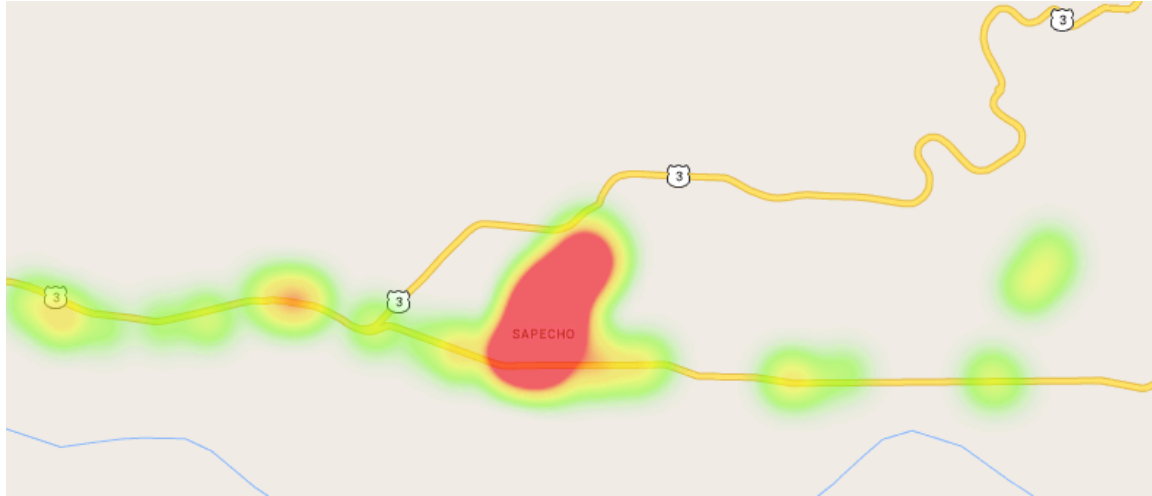
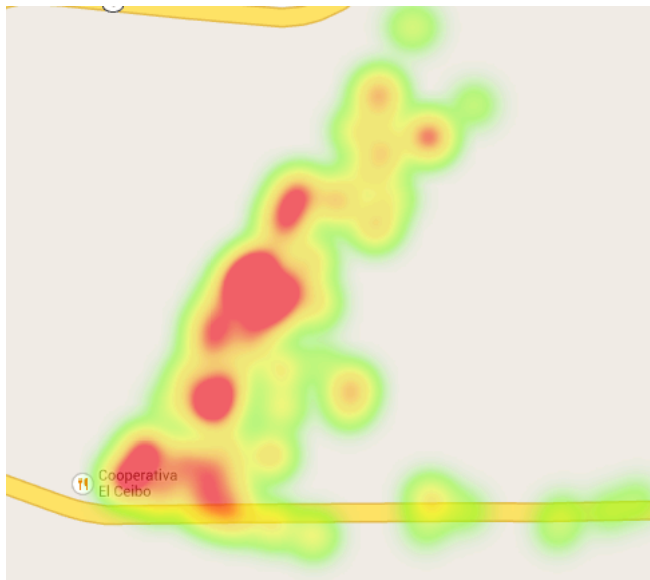


Figure 16: Heat Map of Reported Average Monthly Water Bill

**Red:** Higher cost of Water

**Green:** Lower Cost of Water



**Red:** Higher cost of Water

**Green:** Lower Cost of Water

Figure 17: Heat Map of Reported Average Monthly Water Bill (Zoom on Sapecho Proper).

On the other hand, those outside of Sapecho proper reported less perceived financial hardship, with 78% (18 individuals) reporting that paying for water was never a problem, 13.0% reporting it was rarely a problem (3 people), 4.3% reporting that it was sometimes a problem (1 individual), and 4.3% reporting that it was often a problem (1 individual). I report both percentages and individual counts here to emphasize the humanness of those who have

perceived financial hardship paying for water and also to give the reader a different perspective for the data as sample sizes are varied. I also asked respondents if they felt the water system was worth what they paid for it; in Sapecho proper 90.3% said yes, while 9.7% said no. In adjacent communities 95.7% said yes, 4.3% said no.

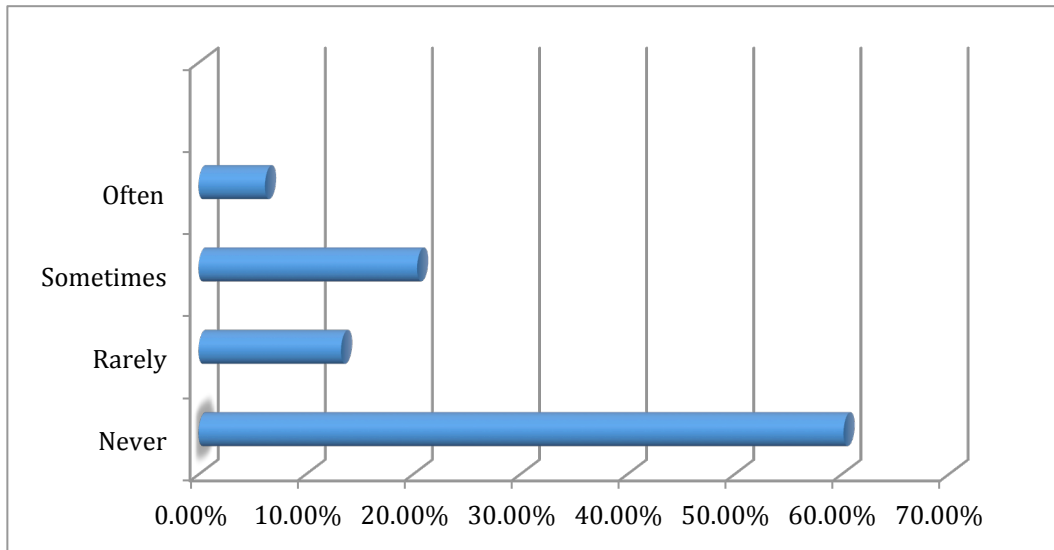


Figure 18: Do you think that paying for water is a financial hardship for you?

**Water Payment Hardship Explored.** Focusing in on Sapecho proper, where metering was implemented, I wish to discuss the nuances in responses related to financial hardship from interview and ethnographic perspectives. Whether or not people felt they could pay for water or wanted to (broadly discussed in the literature as “willingness to pay”), is deeply cultural in its expression.

Certainly, lack of ability (or perceived ability) to pay for some was economic. This was often related to seasonal shortages in pay, as Clara noted:

*We don't have a fixed salary or fixed pay. So because of this we farmers are a little bad [with income/payment], yes, we work, if work is there. But if not...and there are times*

*also when diseases attack the seedlings, or when we get sick, then there isn't anything. And in these times, these issues affect us.* <sup>19</sup>

For some, though, poverty was more persistent. The water committee had a policy that if a household did not pay their water bill for three months (the requirement was to pay monthly) they would have their water cut off. At the time of my research, cuts were uncommon, but happened. At least two families at the time of the research had lost their water access, and were levied with a hefty fine before they could get it turned back on (180 Bolivianos plus the full payment of their past water bills). No one in my research identified himself or herself as people who were unable to pay their bill or those who had their water cut off, however, hinting at social stigma as well as personal hardship from this practice.

For still others, the inability to pay for water was more about making choices about scarce income use than actual lack of income. The question in the survey was: "Do you think that paying for water is a financial hardship for you?". This focused on perception, not actual lack of financial capital. For instance, Abraham noted: "I see families that are able to use a little more [water], but they go to wash at the river, but I prefer to pay, to have a little bit better hygiene. Because I know the river has fungus, like this." <sup>20</sup> Other people noted that those who had trouble paying for water had no trouble paying for soda or other consumer goods.

The truth is that for many, it was not necessarily the actual cost of water, but the situated cost of water that was a problem. From my research, here are some common problems with the cost of water that can be attributed to perceived financial hardship in paying for water (presented as first-person arguments).

1. Water is more expensive than it was before: For many, water used to be free, and now that there is a water system, water costs money. When the WatSan project was originally implemented, the cost was \$10 Bolivianos per household. That was enough of a change for some. Then, the meters went in, and some families had to pay upwards of 70 bolivianos per month. That was just too much, and people went back to the rivers.



2. Water is more expensive for us than it is for the people who live near us: In the areas where water isn't metered<sup>109</sup>, people can waste all the water they want and they still only have to pay 10 bolivianos a month. That doesn't seem fair, does it? Water shouldn't cost as much as it does with metering, and it seems unfair to have to pay so much for water.
3. I don't have to pay for more water, I can just use the river: People are able to make a choice about how much they want to spend on water because of the fact that the river is nearby. Even if you can pay for water, you don't have to—so you have some agency in whether or not to accept or reject the payment scheme.
4. Water should be a right, and I don't like paying so much for it: Some people believed that water was a right, and that attaching a cost to it was unnecessary and wrong. If water is supposed to be free, it doesn't matter if I can pay for it, I shouldn't have to.

These arguments make good sense in the context of Sapecho proper, as well as in Bolivia more broadly.

### **The Nuance of Paying for Water for Collection and Treatment of Waste.**

Interestingly, paying for flushed water (i.e., water for flush toilets), unlike paying for water more broadly, was perceived as widely worth the cost. People who had access to the sewage system appreciated it, claiming that they saw fewer mosquitos, had fewer odors in their homes or bathrooms, and were generally healthier because of the sanitation system. No one I spoke to actually said that paying for water to flush toilets was a financial hardship, although it should be noted that without paying for water to flush toilets the overall cost of water in the area and by household would be less. Furthermore, the 7 Boliviano cost of sanitation, on top of the cost of water, for some only added to existing hardship. While people widely perceived that sanitation was a right (as was water), paying for it, somehow, was less problematic. The complex infrastructure of the sewage collection and wastewater treatment system was so new, and the access to flush toilets and in-home sanitation facilities so novel, that it having a cost was assumed. Furthermore, the conservation piece of the wastewater treatment system, for the portion of the community that actually knew it existed was something of which to be proud (see chapter 7 for further discussion). This component of the WatSan system assisted in conservation of natural resources and was also unique in the area.

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<sup>109</sup> Metering specifics are discussed further in Part 2.

**Discussing the Intricacies of Metered Water Payment.** The issue of “willingness to pay” becomes directly important to the conservation initiatives in the town of Sapecho and in WatSan issues more broadly. Willingness to pay has been tied to the efficacy of water systems’ conservation initiatives, especially regarding the watershed as a whole, in the U.S. (Groothuis et al. 2013) as well as in Central and South America (Kosoy et al. 2007, Moreno-Sanchez et al. 2012). Viscusi and Huber analyze the relationship between cost and risk of water source in their work (2012), and find that peoples’ choices related to water payment were nuanced, and, for example, inability to pay for water didn’t necessarily mean inability to pay for Coca-Cola or other consumer goods. Thus, the perceptions of peoples’ willingness to pay, and not only their ability to pay, must be considered.

**Adding Further Nuance to Water Metering Effects for Marginalized Groups.**

Beyond the issues of financial inability to pay and the intricacies of “willingness to pay” there were certain groups that had difficulty paying for more social and structural reasons. In this section I discuss some of these groups’ lived experience from an ethnographic perspective. Much of the data that allowed me to identify these groups was not gathered in surveys. Instead, it was participant observation and interviews that elicited these more “invisible” concerns. In my work I found two “invisible” groups that were harmed by pay-per-use practices and by metering of water, renters and large families.

*Renters.* One group that had negative experiences with water payment was completely missed by my survey assessment. Because the surveys were completed at a household level, respondents were often the owners of the household, or directly related to that owner. However, Sapecho is home to many people who rent their living space, especially students. It was through participant observation and semi-structured interviews that this population’s plight entered the picture.

Because water costs were assessed by household and gauged by a meter, adding more people to a household logically and effectively increased the household's water usage. While, for many who rented, using water was not an issue as they were able to pay a portion of their rent toward the cost of water, some landlords did not want higher water bills and restricted renters' use of water in order to keep costs down. Four different respondents spoke to this issue from personal experience, and all students who participated in focus groups knew it was happening as well (although only one faced these hardships directly). I further saw several people down at the river who were renters and students washing clothing. Sebastian, a student, noted that "at times, renters say that their landlords are really strict with the water, they ration the water, and there is limitation [in use]." <sup>21</sup> He went on to note that most people deal with these stringent water restrictions by using water "when the landlady leaves, when the landlord isn't there," or, "if that doesn't work they go to the river to wash, etc."<sup>22</sup> Here, we see the river again used as a pressure valve for those who can't access adequate water from the system, here not necessarily because of lack of ability to pay, but instead due to lack of access because of landlord restrictions. Compounding this problem, renters were not eligible to serve as part of the water committee as they were not members of the WatSan project, and they hadn't bought into the system. Furthermore, they did not have a voice at WatSan meetings for the same reason.

*Large Families.* A second variation on the theme of household size; large families often could not pay (or felt that they could not pay) their water bill. A household of 18 effectively has a "right" to water for fewer than four people (see earlier discussion on the formulation of water "right" allocation), which creates a problem.

This concern was brought to my attention through participant observation. I spent several weekend days down at the river washing clothing with close key informants, a mother and her daughter-in-law. Their household had 12 people. They couldn't possibly, they told me,

pay for all the water that it took to wash clothing for a household of 12. They said their bill would easily be 80 bolivianos more than usual if they did all their washing at home.<sup>110</sup> This concern was also reported by other large households.

*A Note on “Invisible” Groups.* These are examples of the groups that the UN website on the right to WatSan warns about – the people who should have access to WatSan in theory, but are left out because it is too expensive or too difficult to access. While every effort was made to ensure that people’s access was affordable, these groups fell through the cracks – so invisibly and so partially that they were missed. They quietly went back to the old way of getting water. As they were still using the system, and in many cases still paying their bills, their hardship was missed by quick surveys of disconnections or disquietude with the system. Their choices about how to use water (e.g. not connecting to the centralized sewage system) were so personal and private (private here meaning inside the home) that their lack of access to water was overlooked.

### **Wider Conservation Pressures**

As introduced earlier in this chapter, emergent themes from interviews with community members and development professionals showed a mutually-constituted attention to and concern about both consumptive water use (meant to be stymied through implementation of metering) as well as two other main conservation issues discussed here: water source protection (and specifically stopping deforestation/reforestation efforts), and water source procurement (meant to be funded through the payment of water tariffs measured through

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<sup>110</sup> What’s more, for them laundering clothing was costly in several respects. It wasn’t just the cost of water, it was the cost of soap and time. Soap and detergent to wash clothing cost anywhere from 4-8 bolivianos. A green bar of soap cost about 4 bolivianos, and it took the family about 3 bars of soap and a bag of detergent (about 25 bolivianos) to do one week’s worth of laundry. And it took 4 people to do the washing (including me) a whole day to do it. Besides the river being more plentiful as a water source, it was faster at rinsing clothing. Also, four people could work at once. A variety of factors made the cost of water just too much.

metering). Briefly, I will discuss why and to what extent these conservation initiatives were sought. While the marginalizing effects of the funding of these wider initiatives have already been presented in the chapter's discussion on metering, this section goes beyond Sapecho's experience and points to wider marginalizing effects for those outside of the Sapecho WatSan system as well.

**Water Source Protection (Deforestation and Reforestation).** Ensuring that lot clearing, deforestation, and parceling of land around the water source was stopped was a goal for the water committee in Sapecho. More broadly, some Sapecho residents were looking to stop deforestation unrelated to specific concerns about Sapecho's WatSan system (instead more focused on environmental management). This was arguably spurred by local conservation policies forwarded by El Ceibo and NGOs (EICEIBO and FONADAL were each running deforestation campaigns in the area). Certainly, deforestation and environmental degradation are wider issues in Bolivia. Especially when coupled with issues of global warming, Bolivia's climatic change has been devastating to the water table (Johnston 2003:75). Deforestation was mentioned as a direct concern for the WatSan system 22 times during the interviews, and direct relationships between conservation of the water source and the long-term sustainability of the water system were raised. As Marcelo states:

*This land [around the water source], it is going to be closed, no one is going to enter, so that there will be water for many years...if they enter now and divide it into lots or cut down trees, there isn't going to be water.<sup>23</sup>*

ACDI/VOCA, too, was a focal point for this conservation focus. The NGO required certain concessions of those who received water systems related to reforestation and conservation of the water source. Sam, one of the development professionals interviewed for the study, stated that:

*[The community members] have to sign off that they are really donating that*

*land to the water system and that they are going to protect it, and then they agree on all the labor they are going to do....one of the big things we do with water systems is reforestation for...protection around the water source.*

The problem for community members was that 1) it was difficult to ensure that people would not actually use that land near the water source, and 2) ownership was an unclear business in the area, with indigenous rights to land and bureaucratic concerns keeping people from being truly sure of water source ownership and land rights. I often asked stakeholders if the community owned the land where the springs were located, and the answer was usually something like Estrella's: "they were in the process [of confirming ownership] before, but now who knows if they are."<sup>24</sup> Because of this, the water committee was still very concerned about protecting the water sources, and especially putting money into widening, cordoning off, and regulating the space. Money from individual water fees was meant to help with this, but sufficient fees had not been collected for these projects. As the president of the water committee stated:

*I have a goal I have raised, to make the area of the watershed protected. Where the water enters the watershed, we say that no one will enter, but legally we don't have this [requirement] no? [We don't have paperwork that says] we are certified, that says it [the watershed] is owned by us.<sup>25</sup>*

He noted that they both wanted the government to provide documentation for and formalize their right to the watershed, and a clear point of this formalization was to keep others from cutting down trees in the area surrounding the water source. This kind of paperwork is difficult to finalize in Bolivia, and while efforts were undertaken by the NGO to ensure these rights were formalized, the practice of development in Bolivia does not always come with perfect "legality."

**Water Source Procurement.** Beyond just water source protection, the water committee wished to procure more water sources in order to ensure the sustainability of the water system. This was in part due to critical shortages one town over in Palos Blancos (there cuts and shortages were an everyday occurrence) and in part due to seasonal shortages and pressure cuts in Sapecho itself (during the months of August, September, and October, when rationing was loosely enforced). There was also a concern that the springs would not last forever, and that in the long term (approximately 20 to 30 years) the water would dry up. The need for more water sources was mentioned 18 times during the interview process. Jhosselin articulated the tensions between needing more water and being able to procure it well:

*About the water system...I would like it if there could be more water, say, if we capture more water, more streams, so that water doesn't dry up over time, so that we have water for all of our days. I think that it could be like this. And like I said in the dry times when the water is low the people go to the river to wash clothes because here there isn't water in the house. But there is water that can be harnessed, there is enough water here up top [in the mountains]. But we lack the financial capital, too. The project for the potable water system has been well done...so, too, I think that we need more projects, to add more streams, say, because... there is water, what we lack are projects.<sup>26</sup>*

**Widening the Scope.** Both of these concerns, about source protection and source procurement, reflect similar issues. The first is lack of financial capital and the second is lack of political and cultural capital to get the job done. Both also reflect potential problems with surrounding communities, especially if those communities would lose resources or land to the WatSan system's conservation initiatives, or indeed if surrounding communities have indigenous rights to these resources. Thus apart from the internal marginalizing effects from Sapecho's conservation initiatives, potential exists for these policies to affect surrounding areas' well-being. Scholars have found problems with the non-use of nature/protectionist idea through

real-life examples when it comes to using land resources. Neumann's (1995) "Ways of Seeing Africa" and Laura Ogden's (2011) "Swamplife" discuss the intimate and reliant relationships that indigenous populations have with land. Li brings up the complex relationship between indigeneity and legislation to protect environmental locations. Indigenous populations, as she notes, struggle with access to their own resources (2008:344). This tension in mind, I argue that NGOs bringing preservation and land sequestration policies for water sources related to their WatSan projects could be setting up an ethical quandary. These projects certainly need water to work, and human benefit for those involved in the project is assumed, but who are they harming in this process? And who will community leaders harm as they continue to seek out new sources of water and conserve the land surrounding them at the same time?

In Sapecho, we see individuals and committees trying to protect a watershed encouraging conservationist practices, but in the end, they are the ones who benefit from the water source and its protection. More broadly, is ensuring the right to water for some actually in line with a rights-based approach if it means that others won't have access to livelihood, such as timber or water, if water is diverted?

### **Right to Water?**

The tensions here at all levels reveal a conflict between the human right to WatSan and the practical implications of providing that right in an improved manner (*potable* water and *improved* sanitation). It takes money to provide improved access. However, whether or not metering campaigns and mercantilization of water resources are the answer to ensuring and continuing this access is debatable.

I return here to the discussion in chapter 3 about whether or not human rights was really a driver for the aid agencies. Whilst at the theoretical level the "right" to WatSan was a contributing factor, the policies put into place once infrastructure is on the ground provide instead a market-related answer to that right over time. The right to WatSan costs money if it is



to last. And if, in Bolivia, some people don't have the money to sustain their own access or the access of their community, how do we handle that quandary? Whose responsibility does it become?

While development ideals recommend that payment for household water serve as a metric for paying for infrastructure, this theoretical division between water payment and infrastructure payment is not well understood by community members. This is especially true for individuals who pay for water that is gauged by a meter. When people pay by their use of water withdrawal and consumption (not a flat fee for infrastructure), individuals perceive that they do pay for water use, regardless of how the development agencies frame the cost.

In an approach that allies political ecology and human rights, big questions include: 1) How does one balance the long-term sustainability of the system with ensuring equal access for community members using the system now?, 2) To what extent should the monetary onus of the system be placed on the individual (metering, upkeep, etc.)?, and 3) How can conservation initiatives be implemented in culturally appropriate ways which minimize harm to community members and their wider, regional neighbors?

### **So, What about Use and Conservation?**

I have presented here several critiques of conservation goals within WatSan systems' development because of the ways that they marginalize certain groups. Does this mean that I think WatSan systems should forget conservation goals altogether? Certainly not. What I do recommend, however, is that attention is given to the potential negative effects of these wider goals on parts of the population and that steps are taken to adjust development and management of WatSan systems in order to address some of these concerns in context. Here, I have only discussed these nuances within one location, Sapecho.

I argue that source conservation and protection is important, but propose the following caveats:

1. Metering of water: Metering of water may have a positive impact in some areas, but it cannot be assumed to have beneficial effects for the whole of the population, nor can it be assumed to truly encourage people to conserve if other water sources exist. I will note that access to river water is a key way that people resist the cost of metered water, and without it, I think true conservation (e.g., grey water reuse), not use of other water sources, might be an expected practice. However, I would add that special considerations should be given to people who rent space and large families. The “right” to water needs to be more individualized, even, than at the household level—each individual person needs to have a right to adequate water use.
2. Water source protection: I agree that the land a community owns should be stewarded well and that deforestation and other land degradation that could hurt the source should be discouraged. However, protection of the source and the cost associated with it should be subsumed in the development process in areas where these stewardship practices would cause undue financial hardship. Furthermore, attention needs to be given to those who may lose access to water or resources because land and the water it holds is diverted from a source to a certain community.
3. Additional source procurement: I argue that the cost of this land/water sources may be better placed with development organizations than with poor, rural villages. Source land should be seen as a development expense, and sufficient land should be purchased to ensure the sustainability of the system in the long-term (20 years). Land purchase should not be a concern for communities for at least the first ten years.

Notably, none of these findings would have been possible if I did not take an ethnographic approach to data collection and analysis. A classic approach to monitoring and evaluation, without participant observation and grounded ethnography, would have missed not only the nuances of use practices in Sapecho, but also the negative impacts on small groups within the community.

### **Political Ecology of WatSan and Conservation**

WatSan systems, a development outcome, benefit certain communities at the expense of others—and that is just a start-point. Once the system is in place, individual use practices, day-to-day lived experience, and relationships with environmental resources and basic human behaviors (e.g. drinking, bathing, and defecating) change. These systems are widely implemented with an eye toward long-term sustainability and stewardship for the environment, and with an attempt to minimize environmental harm from diverting water resources. These

practices and approaches are necessary, and it is certainly a part of responsible development to ensure environmental protections. Where these practices become problematic, however, is when the intricacies of the policies implemented by water managers have unintended negative effects on the very people they are meant to serve - the community members. It is further a problem when conservation approaches have wider effects on people who are not beneficiaries of the system but end up bearing the burden of the development. The pillars of a political ecology approach, attention power, levels of governance, marginalization, and unexpected impacts which stem from mutually-constituted enviro-social relationships all provide the framework for showing the negative side to conservation practices, and here they are reflected in the reverberations of an improperly devised and executed conservation scheme.

Veronica Strang found that metering has done nothing “in stopping or even slowing the rise in per capita water use [in Dorset]” (2004:45). In Sapecho, metering very well may have stymied the use of water from the water system, but the existence of culturally-accepted and immediately available river water offered an alternative to people, such that they aren’t necessarily using less water, they’re just using less of the “good stuff.” Furthermore, the cost of water was perceived as a financial hardship by many, and thus these people were marginalized and less likely to benefit from the system itself. Metering makes usage more “visible” (Strang 2004:45), but it can actually, I argue, make the user more invisible. We mustn’t let metering as a practice obscure the needs of the individuals that are on the other side of that gauge.

Conservation and use are difficult to balance, especially when funding is limited. The ways in which scarce funds are solicited and then used are indicative of certain political and social priorities, on the part of many different stakeholders, which may end up prizing ecological impacts over human ones. Whether or not this is a bad thing is more theoretical. Who matters more, people now or people later? It is the same discussion that is taking place on a national level in Bolivia; does Mother Nature have the rights of a person? Or do actual people matter

more than the environment? I'm not necessarily suggesting that development agencies should know how to make this choice or have the right answer right now, but they certainly need to consider the quandary, as do WatSan practitioners and academics more broadly. Raising political ecological issues, such as power, rights, and access to environmental resources, is a particularly good way to do this.

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<sup>15</sup> Ya, yo uso unos, para la cocina digamos, para la alimentación, lo otro es para aseo personal, la ducha, y el servicio, el baño, diariamente y para lavar ropa también. Eso se usa normalmente, en mi casa, y aquí casi lo mismo ¿no?, somos muchos, y usamos en eso...

<sup>16</sup> Frecuentemente las mujeres usamos para el aseo de la casa, para los servicios, lavar ropa, todo eso, en cambio los varones lo usan para ducharse, a veces de vez en cuando lavan ropa también.

<sup>17</sup> Cairns: ¿la gente todavía usan los ríos aquí en el área?

Dr. Horatio: sí, sí, y gracias a eso es que todavía estamos un poquito elevados con este caso de las enfermedades diarreicas. Y no solamente es en niños, todavía existe en adultos, porque hay todavía gente que sigue yendo a lavar sus cositas a bañarse, y al bañarse no solamente se adquieren infecciones diarreicas o gastrointestinales, también adquieren infecciones cutáneas u otras cosas que se han ido viendo.

<sup>18</sup> Toditos tenemos medidores. Y habíamos sido los únicos de la zona que tienen medidores en su sistema de agua. Por eso manejamos...hay un reventón entonces, fácil, rápido arreglamos, llamamos al operador nos arregla. Porque, porque si no nos sigue subiendo la cuenta, cuando no hay medidor, a la gente no le interesa.

<sup>19</sup> No tenemos un sueldo fijo o un pago fijo. Por eso el campesino estamos un poco mal, estamos si trabajamos, ahí, si no...hay ratos también atacan a las plantita también enfermedades atacan, ya no da, entonces ese rato nos afecta, pues.

<sup>20</sup> Veo familias que pudiendo gastar un poco más, se van a lavar al río, pero yo prefiero pagar, tener un poco más de higiene. Porque sabes en el río hay hongos y así.

<sup>21</sup> Si a veces, comentan que sus dueños son muy estrictos con el agua, les racionan el agua, hay limitación.

<sup>22</sup> Normalmente cuando sale la señora, cuando la dueña no está, o si no se van a al río a lavar.

<sup>23</sup> Ese terreno, va a estar cerrado, no va a entrar nadie, para que haya agua para muchos años...si entran ahora a lotear a chequear no va a haber agua.

<sup>24</sup> Estaban en trámite, no se si ahora están.

<sup>25</sup> Tengo como meta, he planteado, es hacer el área protegida de los vertientes. O sea de donde entramos a la vertiente, claro nosotros decimos que nadie va a entrar, pero legalmente no tenemos ¿no? Que nos acredite, que diga que es propiedad de nosotros.

<sup>26</sup> Sobre el sistema de agua...yo quisiera que se amplíe más el agua...digamos, se capte más aguas, vertientes, porque no seque con el tiempo, que tengamos agua siempre todos los día...yo creo que será eso...y como le digo en épocas de sequía, seca el agua porque se va...y cuando ese tiempo seca,

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mayormente vamos al río a lavar ropa también, porque aquí ya no hay agua en la casa...pero de que si hay agua para captar, hay harta agua ahí arriba, falta ese coste económico también, proyectos que se han conseguido el sistema de agua potable...entonces...también yo creo que se necesita más, más proyectos, para poder adjuntar más vertientes digamos...de que sí hay agua, hay agua, lo que falta son proyectos.

**CHAPTER 6:**  
**POLITICS OF EQUAL UPKEEP IN RURAL WATSAN SYSTEMS**

**Water Payment Day**

Managing the WatSan system requires community management and community participation—it also requires community money. This entry from my fieldnotes gives a narrative account of what payment day looks like in Sapecho, and gives a good introduction to both the pace and the presence of WatSan billing day. It also serves as a conceptual link between the place of individuals who use water (the focus of the last chapter) and the way that water is managed (the focus of chapter 6).

*Each Sunday the bookkeeper for the water committee sits at the Jasapas building, waiting for individuals to come and pay their water bills. From 8-12 and then again from 2-7, she waits. It is about 11 now, and she's only had about 10 people come to pay. She sits in a blue-painted wooden chair in the doorway, slumped with her shoulders curled over and her head in her hands, bored. Checking her cell phone. Staring off.*

*It is a reasonably nice day, and I'm pretty sure this young woman would rather be somewhere else, although that is me talking. It is cool outside with a bit of sunshine. All the other young men and women are in the square, talking, hopping on the back of motorcycles and taking off for some other part of town—maybe Palos. She's watching all this tiredly.*

*A church bell rings out over the plaza. Catholic church. Most people in the square barely flinch—the congregation looks to consist of about 10 people, mostly kids.*

*A Cholita in a long black skirt and grey t-shirt covered in a bright baby-blue, well-worn floral-patterned apron, sits talking to an old man in a sweater vest. He's gripping a walking stick hewn from a tree branch. The woman's two long black braids are connected by a string strip of black yarn, which is almost indistinguishable in color from her hair.*

*Kids rush by me, 5 of them sharing 2 scooters. A nun all in white walks slowly in the other direction, away from the church, smiling as the kids rush along—the kids are fighting over rights to the toys. Later, the kids work out a system, and, like clockwork, a couple of them at a time come racing by—various ages and heights, looking silly on one or the other of the scooters because it is either too big (there is a tiny girl, maybe three, on a teenager's scooter), or far too small (an 11 year-old is on a bright neon green Tyco-looking scooter that his foot barely fits on).*

*Young men in orange vests survey the street. The two of them are looking out over the plaza. The secretary is still slumped in her original position, waiting. She hasn't had someone by in the last 20 minutes. She's got on the same grey t-shirt and black exercise pants with a pink stripe that I've seen her wear every-other-day for a month. A mistuned microphone squeals out from the church, which is still hollow inside, all benches and air.*

*Scooter again, one of the boys has wrestled it away from the others, and he's pushing it lazily along and saying hello to everyone he passes like the king of England in a chariot.*

*Now the secretary has leaned her head against the doorjamb and is half asleep. Eyes closed, long black messy ponytail over one shoulder. A family drives up on a motorcycle and stops short in front of the TV station. They pile off— Wait, the secretary has a customer. She jumps up from her spot with verve and goes inside. The man wears a long-faded red polo, his face looks to be in a hurry. The bookkeeper dutifully pages through the excel spreadsheet that has been printed out and is now covered in green highlighter. She finds his name, it takes her less than a minute. No pomp and circumstance, though, he's in a hurry and quite frankly she's not much of a talker. He emerges about 1 minute later, having paid, with a receipt.*

*She resumes her boredom. This time from the other end of the desk. Then she decides to move back to her original position, slumps again, and stares. The instantaneous energy of the moment of work lost as quickly as it came. Why on earth does this payment day take 9 hours every Sunday?*

## **Introduction**

The ways that community-elected water committees manage WatSan systems directly relate to the nature of WatSan outcomes for the community at large, regardless of what type of infrastructure system is implemented.<sup>111</sup> The choices made by the water committee (e.g. cost of water, operator budget, maintenance schedule, inclusiveness of oversight, and transparency in accounting) can all change the efficacy and effectiveness of a system. A central tension often discussed in political ecology of water approaches is the problem of “who gets to decide” in WatSan settings (see Whiteford et al. in press: n.d. for three case studies that give examples of this). The decision-makers at the community level hold a critical position in the decision making process for WatSan development, and their relationships to funding agencies, NGOs, and the community at large both influence and constrain their decision-making. Furthermore, the power

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<sup>111</sup> While, certainly, more complex WatSan systems can be more difficult to keep up than more simplistic/less labor-intensive choices.



systems at play that let individuals participate—or not—in this committee level decision-making are often socially-determined. Voice, or individuals' ability to participate and articulate their positions within decision-making, and participation, or individuals' ability to truly engage in the process of water and sanitation and its governance, are two key areas that are recurrent areas of power imbalance within WatSan processes. Thus, culturally-based rules and regulations impact individual participants in the WatSan process with varying degrees of negative and positive impact.

This chapter focuses on applying a political ecological approach to understandings of WatSan management and upkeep employed in Sapecho's system, with specific attention to the place of the water committee in these decisions. The chapter also melds theories of WatSan rights, appropriate technologies, and understandings of water committee modeling (centered in NGO approaches) to the discussion on management. The main argument of the chapter is that even if the project as a whole is successful and beneficial in its technical, infrastructural implementation, missteps in the management of WatSan systems can be detrimental to the long-term efficacy and effectiveness of the WatSan system. In the first section of this chapter I discuss the water committee structure, its aims, and its potential disconnects with larger community WatSan issues. Next I seek to identify marginalization stemming from WatSan management and to address unexpected and undue harms seen within parts of the community. One common trope in discussions of WatSan development is that WatSan projects are unique in their ability to bring a whole community together—(see chapter 3)—but in this chapter I challenge that assumption. Are there community members who fail to benefit from the resulting “togetherness”? When the novelty of the project's implementation wears off (as it inevitably does) who then bears the system burdens of management and upkeep? In this vein, I address and critique, through this chapter, WatSan management's gendered policies. Further, I discuss past and potential concerns for the water committee, including increased migration to the area because of the WatSan system (and providing WatSan to these migrants) as well as the burden

of garbage removal and management. Tensions between inclusivity and coverage in WatSan are expressed through this discussion.

Throughout this chapter, I treat water and sanitation management, at times, as two separate areas of analysis. While this may produce a false dichotomy between the two aspects of WatSan, it is necessary. Despite the convention of grouping water delivery and the management of sanitation, in practice the committee and the community both manage and perceive water and sanitation differently (as I'll address in more detail in chapter 7). This is important to understand as an academic and as an applied practitioner. While human rights, academic theory, and development may petition for these two activities to be fully integrated and linked (and I hold that optimally they should be perceived and acted upon together), at several levels of the development process water and sanitation have very real differences in implementation, management, efficacy, and equity.

### **Performance and Possibility**

WatSan programs are implemented in rural areas to provide access to potable water, removal of sewage, and wastewater treatment. As early as the 1980s, however, "it became widely recognized among sector professionals that rural water supply programs in developing countries were performing poorly (Bakalian 2009:4). Furthermore, as Jennifer McConville and James Mihelcic state, "only 50-66% of the water supply and sanitation projects evaluated by the World Bank in 2001 were deemed to be satisfactory and less than half were rated likely to be sustainable" (2007:939). In addition, in 2012, Kelly Alley outlined several system failures in India, and argues that these are situations are reflective of larger issues in the WatSan sector. These high levels of reported failures cannot be fully blamed on issues of shoddy infrastructure, although social problems with infrastructure upkeep and management are a clear hindrance. Problems with longevity of system infrastructure and situated upkeep are common to problematic WatSan programs (and these problems are more likely due to planning and

maintenance issues than infrastructure failure). Adding to this problem, rural water supply and sanitation systems are consistently less robust than urban systems, as shown in WatSan comparisons across several countries (Bos and Brocklehurst 2010, Sara et al. 1996). This leads to a wide rural-urban divide in the WatSan coverage. Regardless of rural or urban locale, the fact remains that even with the best of intentions and planning, WatSan infrastructure placement in itself does not equal a fully viable and long-lasting solution to WatSan needs due to the integral role that management and upkeep play in the sustainability of a project. Social, environmental, economic, and infrastructure management issues can all have detrimental effects on WatSan program placement. While it could be easy to posit that any attempt at addressing WatSan problems will be beneficial despite on-the-ground challenges, it is important to note that non-working centralized water distribution systems, as in Sapecho, are actually “vulnerable to intrusion and contamination and may contribute to endemic and epidemic waterborne disease” –possibly doing more harm than good (Moe and Rheingans 2006:42). Stakes, then, are high. Projects must be careful to not only to provide access but also ensure that access is viable in the long-term. The management of a system is both necessary and important for the benefit of the population and the benefit of the surrounding environment. Water committees are often put in charge of the management of these systems, but are ill equipped to handle the needs of the system. Especially in rural areas, water committees have only been partially effective. While placing responsibility on community members does often give a feeling of ownership for the WatSan system, the committee model does not actually foster system sustainability in many cases (Suzuki 2010:16-17).

### **Background on Management and Water Committee Modeling in Bolivia**

Systems for management of WatSan projects are widely varied in Bolivia, where cooperatives, committees, governments, and other types of management models are in use (Bustamante et al. 2004). These management systems are often implemented piecemeal and

by a variety of actors, with infrastructure and governance procedures similarly fragmentary. Beyond the management issue, it is not uncommon to have a water system built through several iterations of infrastructure, with partial assistance over time from both governments and NGOs, as in Sapecho. In Sapecho, household-level infrastructure in the community was built by a variety of individuals and NGOs, and the water system was a moving target over time, with the Lutheran church and various NGO's partial attempts at system implementation occurring prior to USAID and ACDI/VOCA's system. The ACDI/VOCA system completely overhauled the WatSan delivery in the area, and demolished and replaced older attempts at WatSan provision. Countrywide, it is not unusual to encounter remnants of water management schemes from various projects in a single community setting (personal experience in Alto Beni and Cochabamba, Bolivia). This patchwork coverage scheme is imperfect, and relatedly, the implementation of irregular management schemes makes water management difficult to understand in the country. Often, these management schemes are ad-hoc systems that operate on mixture of spotty institutional memory and intuition, regardless of the best-laid plans of NGOs and the community members themselves.

The water committee model, though, has been widely implemented as part and parcel of USAID/ACDI/VOCA's WatSan provision relationship with Bolivia, and the general premise of the design is not so different than other permutations of committees, in that they include an executive board, security members, and employ an operator. While the water committee model has been widely implemented (Brikke 2000), it is also often criticized. Renzo Taddei argues that formulas for proper participation and structural management of water sources can lead to issues with the political process, and suggests that conflating participation in WatSan with ideas of "democracy" leads to a singular focus only on those who participate, and thus makes other groups within community settings "illegitimate, irrelevant, or invisible" (Taddei 2011:110). I use the idea of "invisible" groups in chapter 5 to address unexpected marginalization from water metering, and focus on this again in this chapter. While active participation in water committees,

and more broadly WatSan management, has been directly related to the long-term effectiveness of those systems (Suzuki 2010:13), lack of participation can be detrimental. As evidenced in this chapter, both participation and marginalization are interrelated and were clearly existent in Sapecho.

The management of water resources in local contexts requires “transformations in the loci of power over resource value, access, use, and control from resident peoples to external power structures” (Johnston 2003:76). When it comes to water, as discussed in chapter 5, the water committee is charged with setting and collecting water fees from community members in order to ensure the upkeep and long-term effectiveness of the WatSan system. The fees for water that they collect effectively place the committee in charge of renegotiating the value of water (mediated by the NGO), collecting money based on the exact use of that water (through metering), and then exercising the power to choose how those funds are best spent<sup>112</sup>.

Committee members are also charged with the management and upkeep of the sewage system and the wastewater treatment system. Though billed at a flat fee, they are again commodifying the cost of human defecation, protection of the environment through wastewater treatment, and sanitation. Because of the water committee’s powerful impact, the ways in which the community views, perceives, and assists the water committee are directly related to their overall acceptance of the WatSan system and their comfort with community-run infrastructure. The committee members bear a weighty responsibility, and one I argue that has not been adequately conceptualized or measured. While it is true that the water committee was both locally- and externally-mediated in Sapecho, the fact remains that the committee’s actions may not have always placed the best interests of certain community members (e.g., marginalized groups discussed later in this chapter) at the forefront of management practice. Further, it was

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<sup>112</sup> I place this chapter on the politics of equal upkeep after the earlier discussion on water metering as the way that these funds are used is again interrogated here.

evident that their newfound power over resource, use, and value of water was, at times, problematic.

Notably, the water committee held a new and interesting position within community governance structure. While in Sapecho there were local government representatives (municipal government), and neighborhood organizations, the water committee was independent and did not answer to these groups. They had access to power that neither the local government nor the neighborhood boards could engage in both their ability to have a voice in international NGOs' decisions and their ability to make decisions about how funds gathered from water tariffs were used. The water committee did not report any ability to work with the state government or gain assistance for the water system through the state. Their power within the community, especially related to their position as representatives to international NGOs, was both necessary and potentially problematic.

### **Power and Prospects**

Water committees are not only imbued with the power to manage water, they are often also perceived as having a community-level position of power and influence. For instance, in Sapecho, when projects for poultry production, roads, or other development were proposed, after the WatSan committee was implemented, NGOs began to look to the water committee as representatives of the community and sought their collaboration.<sup>113</sup> Committees can be beneficial in that they provide a democratically-elected, engaged administration for water, but if the committee becomes the de facto board for all development, their power and position within the community can grow beyond the intended mandate, as it had at times in Sapecho.<sup>114</sup>

By implementing a water committee structure, NGOs and communities are creating a

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<sup>113</sup> Often these community members may be the most active or well-known within the community regardless of this relationship. However, this solidifies and enshrines their leadership and decision-making power.

<sup>114</sup> At the time of my research the committee was criticized for spending so much time collaborating on issues with new road pavement and construction.

new representative board for their interests. It is easy, especially in communities with weak local municipal governments, for NGOs to go straight to the water committee to get approval and action for development endeavors. There are two main issues of boundary and scope that I witnessed in Sapecho. First, individual committee members' wide execution of power and influence within development projects as a whole caused upset for the greater community. People saw that the water members were "getting ahead" because of their position, and disliked their undue influence. Second, NGOs' constant tapping of the WatSan committee's attentions for other projects took the focus away from water and sanitation. If the committee was focusing on roads or a juice production plant and not WatSan,<sup>115</sup> then water and sanitation concerns went unattended. In Sapecho, this tension was only heightened by the fact that some water committee members had taken jobs with NGOs in La Paz and others had leaved their positions for better jobs outside the community. It should be noted, though, that this personal benefit was by no means assured for committee members. Being a part of the water committee was billed as a service, and in Sapecho it was treated as such (e.g., unpaid, elected positions). Further, these committees often work with little in the way of resources and in challenging, ever-changing environments (Mehta et al. 2013:6), often find themselves on the hook for water issues outside of their control, rarely get much monetary or peer-to-peer appreciation for their work, or at least not enough to make it emotionally and personally "worth it" (Suzuki 2013:65). This can certainly mitigate any negative view of these individuals' choices within the committee structure.

My intention in my research was to work in concert with the water committee in Sapecho and its members to address potential and reported issues by the board itself, to identify areas of disconnect between the committees, the community, and NGOs, and to provide a critical but productive approach to handling emergent issues in WatSan for the community.

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<sup>115</sup> Both allegedly occurring while my research was conducted.

## **Management of the Sapecho WatSan System**

Once the community of Sapecho was approved by the two partners (USAID and ACDI/VOCA) and by the Vice-ministry of Coca, and once the community proposed the WatSan system idea, had it approved by ACDI/VOCA (see chapter 3 for full discussion of this process), a project official was chosen by ACDI/VOCA (a staff civil engineer) and assigned to the community. This project official, as well as any trainers associated with the project, visited the community with the design team. The design team worked with the community, and the community created a works committee composed of an unelected group of interested community members. This works committee then was responsible for working with the design engineers to ensure inclusion of all community members during the construction and implementation of the system. Once the project was completed, the works committee gave way to an elected water committee. ACDI/VOCA refers to this as a CAPIS “*Comité de agua Potable y Saneamiento* [Potable water and Sanitation Committee]” but throughout this work I will refer to this as a “water committee”, or just “the committee.” According to one of the development professionals in my study, Sam, the water committee is the group in town that “is the organization that like, actually is really an organization—and it is permanent so, after the water system is done they need to collect fees, they need to hire an operator, or a plumber, or whatever in case there is a problem.” In Sapecho, the water committee was the clear authority for WatSan decisions.<sup>116</sup>

### **Committee Generated Concerns**

The president of the water committee outlined 5 clear areas of concern for the WatSan system. These concerns reflect issues that are raised in the previous chapter (i.e. conservation

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<sup>116</sup> Beyond each community’s water committee, there is a larger committee for the entire megaproject, which the community assembled on their own. That being said, the committee was only loosely organized, and each time they planned a meeting while I was completing my research it failed to happen. Thus, I cannot speculate as to its effectiveness or position within the community other than through respondents’ comments.



and protection of water resources) as well as ones that are addressed in the following chapter (i.e. sanitation-specific concerns). The concerns were that the water committee group must:

1. Ensure that the committee receives legal association status.
2. Ensure that the committees receive legal paperwork showing ownership, and ensure that they privatize and cordon off the water sources.
3. The committee must implement biannual (twice yearly) sampling and testing of water quality.
4. The committee must focus more on the sewage collection system, noting that the water generally worked, but the sewage collection system was unreliable.
5. Encourage people to pay their bills on time in order to lessen water service cutoffs.

These goals both aligned with and diverged from individual community members' perspectives on the main issues that the water committee needed to face (as I will introduce in the body of this chapter). Water committee members were charged with the long-term management and upkeep of the system, and thus their goals and actions were largely focused on infrastructure. The rules for community members, such as metering, sanctions for non-payment, and so on, seemed to stem from the needs of the system, rather than vice versa (as discussed in chapter 5). While these goals aligned with those that the organization ACDI/VOCA set in their manual for the water committee, I argue that the infrastructure-focus of the committee may need to be widened in order to be truly inclusive and resonant with the community's goals and needs.

### **Committee Structure**

The WatSan committee in Sapecho consists of a president, vice-president, secretary, treasurer, and up to three security members. Please see Table 1 for a run-down of the position, their position's requirements (as per my experience), their service period, their payment, and the most common genders associated with that position, according to interview responses. Key issues to note are that the service period for elected members was raised by the community from one year to two due to emergent concerns with institutional management. Further, committee members are not paid for their participation in the WatSan committee. Additionally,

gender was a clear issue in WatSan management, with the treasurer and cashier often female, while higher-up positions was overwhelmingly held by men.

Table 1: Water Committee Structure

<b>Water Committee Position</b>	<b>Service Period***</b>	<b>Tasks</b>	<b>Paid?</b>	<b>Most Common Gender</b>
<b>President</b>	2 years, often a second term member, elected	Work with NGO Run committee Head decisions	No, free water base (only pay for over 10 Bs)	Male **
<b>Vice President</b>	2 years, elected	Work with committee, manage operator	“”	Male
<b>Secretary</b>	2 years, elected	Take notes at meetings, take care of paperwork, etc.	“”	Male or Female
<b>Treasurer</b>	2 years, elected	Keep track of financial documents	“”	Female
<b>Security 1</b>	2 years, elected	Address concerns with system, ensure committee ethics	“”	Male
<b>Security 2</b>	2 years, elected	“”	“”	Male
<b>Security 3 (optional)</b>	2 years, elected	“”	“”	Male
<b>*Operator</b>	No change, not elected	Handle all breaks in the system, all operation concerns, work with NGO, specifically in charge of wastewater treatment with little help	Yes	Male
<b>*Cashier</b>	No change, not elected	Take payments each Sunday	Yes	Female

\* The president is often an elected member who is shifted after their first year of service, or someone who has served a 2-year period and stays on for a third.

\*\*At the time of my research, a female actually held the president position, however as I discuss later in this chapter, it was as more of a figurehead.

\*\*\* The service period began at 1 year per person, but was changed by the community to two years. In practice, the terms were a bit flexible; at the time of my research one member had served for three years.

This committee structure, as described in Table 1, is rather common in development, but there are two elements that make the water committee structure in Sapecho distinctive. The first is that community-based management groups are both externally recommended and locally designed. The committee model is recommended by the NGO that put the system in, but the committee format is also reflective of traditional Aymara and Quechua leadership models in that they rely on community-centered and local management of practices (Marcelo 2009). While the system is far from *el ayllu*<sup>117</sup>, themes of collective responsibility, shared leadership, and community are clear tie-ins. The second element is that the committee has developed its own organic “fixes” for the system (e.g. increasing the service time per person from 1 to 2 years). This means that people in Sapecho are first more comfortable with the committees than other areas might be (due to Aymara influence), and second have shown foresight and flexibility within the system, by changing the rules based on on-the-ground concerns.

While I could likely write about water committees for an entire book, I have chosen to highlight two main components of my research foci and findings here: 1) What are community-sourced recommendations for improvement for the water committee, and 2) Is the committee representative of the community (both from the community’s point of view and from an etic perspective)? For section 2, I give specific focus to issues of gender.

I have chosen to focus only on the population of Sapecho proper (excluding the areas of Brecha A and 29 de Septiembre) for this discussion as the Sapecho water committee is the focus of this portion of the work (n=112). Interviewees’ and focus group respondents’ perspectives are also all focused on the Sapecho water committee.

### **Unseen Issues and Situated Tensions**

Prior to the discussion of the community’s views of the committee, I will highlight the two main issues with WatSan management that I discovered during my time in Sapecho in order

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<sup>117</sup> Traditional family networks that worked to ensure management of agricultural lands (Aymara/Quechua).

that the reader can address this section from a critical perspective. In short, both the potable water system and the sewage collection system were only partially functioning. As knowledge of these facts outside of (and even within) the water committee was limited, their discussion surrounding water committees' effectiveness does not adequately address these larger problems. The two major issues with the system at the time of my research were that:

1. While the gravity-fed water system was delivering water to households, the water was not treated with chlorine, and its potability<sup>118</sup> was unclear. The operator did not feel comfortable using the chlorination system, which was installed during the WatSan development project. Thus, the water coming into peoples' homes was untreated.<sup>119</sup>
2. The wastewater treatment system, completed only 4 years prior to my research, was only partially functioning. The reactor had not been cleared of sludge as recommended, and so the reactor was not working effectively, and effluent was released only partially treated. By the end of my work in Sapecho, the reactor had been bypassed completely, with wastewater going directly to the treatment lagoons. The partial failure of the reactor may have resulted in higher organic loading in the maturation ponds.<sup>120</sup>

While blowback from the breakdown of the wastewater treatment infrastructure was not directly impacting individual households and was largely an unknown problem, the lack of chlorination in the fresh water system was directly impacting individual behaviors for those who knew the problem existed. Some people feared the use of chlorine,<sup>121</sup> and thus pressured the committee and the operator not to put it in the water. Chlorine use was perceived by some to cause gastritis, or cause harm in general to individual health. The operator didn't feel confident that he could adequately and safely chlorinate the water, and so he didn't treat the water.

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<sup>118</sup> I use the definition of potability noted by Mihelcic and Zimmerman (2014): "Potable water refers to water that is healthy for human consumption and free of harmful microorganisms and organic and inorganic compounds that either cause adverse physiological effects or do not taste good."

<sup>119</sup> This adds nuance, too, to the cost of water as explained in chapter 5.

<sup>120</sup> I worked directly with Nathan Reents and the water committee to identify and address these concerns with the USAB reactor, and I was tasked, as part of the grant, with photographing the process. We worked to remove the sludge from the reactor which was allowed to accumulate due to improper management and a problem with the cleaning tube. Under the direction of Nathan (an engineer) we tried several ways to clear the sludge (discussed further in chapter 7). Unfortunately, none of these attempts was successful. The reactor, to my knowledge, continues to be broken. This report was given to the community.

<sup>121</sup> Chlorine, in appropriate doses, is trusted to treat pathogens in fresh water at the catchment tank, prior to entering peoples' homes. Chlorine is used widely to ensure that fresh water sources are safe for human consumption.

On the part of the population, the following four behaviors demonstrated how their perceptions influenced health:

1. Individuals knew the water wasn't chlorinated and so did not boil the water because they felt it was naturally safe to drink.
2. Individuals knew the water wasn't chlorinated so boiled the water because they felt it was unsafe to drink without home treatment.
3. Individuals thought the water was chlorinated and so didn't boil the water because they thought it was safe to drink.
4. Individuals thought the water was chlorinated and so boiled it to get the chlorine taste out/to make the chlorine less harmful to health.

Each of these options fall victim to the same main two issues: lack of knowledge of treatment practices, and lack of understanding about the risks and benefits of chlorination. The effect, regardless of the permutations, was a complete information breakdown. For some this led to health risks. One of the water committee members spoke to his perspective on chlorination, arguing that he felt that the water was safe enough naturally and that the people knew how to treat it in their homes if they needed to (e.g., they could boil the water themselves). They had heard that many of the community members didn't want the chlorine to be used, that it can be bad for health, and that if the dosage was incorrect it could cause a lot of harm. So, they didn't put any chlorine in the water. When I asked if the water was clean enough for the people to drink, the committee member said, "I suppose that it is, we don't know anyone who has gotten sick because of it."<sup>27</sup> His lack of concern was telling, especially as this was mirrored by many community members. Not chlorinating water, of course, deviated from the NGOs' design for the system as well as their direct training program. The NGO was aware of this issue with chlorination, but had not yet been able to implement an alternative. It could easily be argued that the committee should understand, implement, and encourage chlorination in the area for public safety and wellbeing. On the other hand, however, the committee should also represent

the wants and concerns of the community as a whole. Full community training is necessary to address this issue.

### **Community-sourced Recommendations for WatSan Committee Improvement**

Sapecho proper's committee, by far the most visible in the megaproject (and the most active), was also the one with the most responsibility.<sup>122</sup> Not only did the committee tout the only operator, it had the highest population and the only sewage collection and wastewater treatment infrastructure. Even so, many community members felt the committee was doing an effective job. Jhulissa, for instance, felt that the committee had really improved their water pressure and access. Many of the members of the community I spoke with felt that the water committee members were responsive to issues and that the committee was doing fine. To further make this point, a majority, 82.1%, of respondents, felt that they had access to speak to committee members regarding problems. However, 17.9% did not feel that the committee members were accessible (thus harkening a potential issue for a subset of the community, as was certainly felt by some in my study). When asked if the water committee had the power to make changes in the community, results varied: 15.2% of the community felt that the committee had no power, 22.3% felt that the committee had a small amount of power, 33.9% felt that the committee had a moderate amount of power, 27.7 felt that they had a large amount of power, and .9% felt that they had too much power (see figure 19).

This question of power relates to two points: the first is that most felt that the committee had the ability to make changes (which is certainly necessary for a WatSan group), but the second is some community members (as was mirrored in the interviews) felt that this power was at times misused. Broadly speaking, while the water committee got the "okay" from many, they did not get a full pass from all.

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<sup>122</sup> As a reminder, each community along the megaproject line had its own water committee by design (see chapter 3).

Many community members spoke to issues with community management and recommended fixes to the management process.

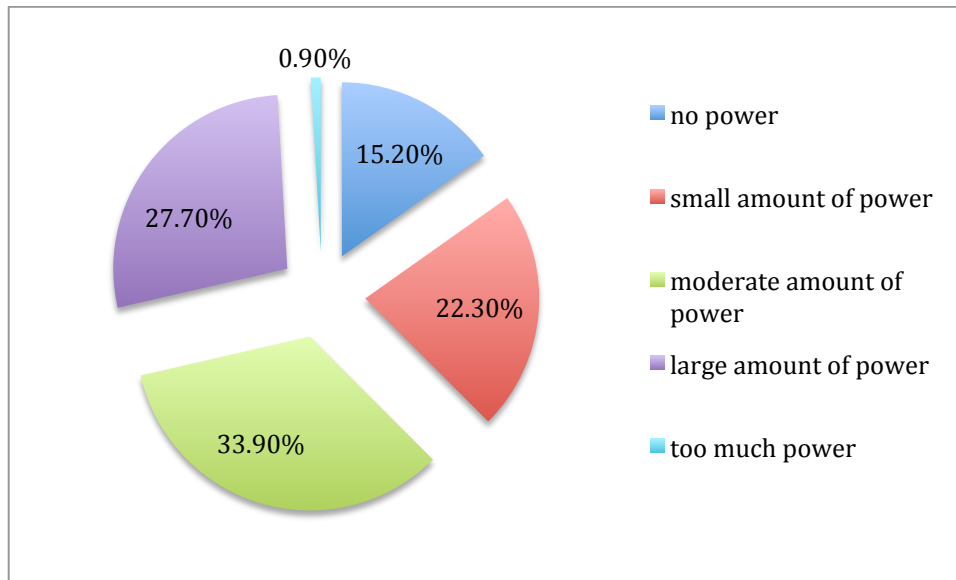


Figure 19: Do you feel that the water committee has power to make changes within the community?

There were certainly areas for improvement that were noticed by community members. I present summaries of these discussions here in order to address and collate the recommendations. Community members who participated in the study suggested the following areas of improvement/suggested opportunities for the water committee (paraphrased/summarized), represented in Table 2.

These responses are presented alongside a sector tag, which qualifies the concern based on heuristic categories: knowledge (gaining WatSan information), conservation, provision (ensuring water access), infrastructure, inclusion (including community members), checks-and-balances (self-governance), and work. One interesting point is that many people had different recommendations, but all, I think, are necessary and actionable.

Table 2: Respondent Recommendations for Water Committee

Respondent-generated concern	Sector
<u>Lawrence</u> : The committee needs to go to more national level and global level meetings on water and water conservation. They also need to do more studies of the water.	<b>Knowledge, conservation</b>
<u>Abraham</u> : When there is a problem with the system, like a break in a pipe, the committee needs to help the operator more. Also, they need to get more sources of water to help with pressure drops in the dry season.	<b>Infrastructure, provision</b>
<u>Estrella</u> : The committee and the community need to make sure that the people elected to the committee have some sort of knowledge of WatSan issues.	<b>Inclusion, knowledge</b>
<u>Juan</u> : People all need to take responsibility for the system, and the committee needs to make people participate and clean the tanks, etc. The committee needs to take responsibility for encouraging community-wide participation.	<b>Inclusion, work</b>
<u>Carlos</u> : The committee needs to address and learn from past problems with economic management and embezzling. The committee needs to have checks and balances to address this.	<b>Checks and balances</b>
<u>Gabrielita</u> : Women should <i>really</i> get to be president of the water committee and should <i>really</i> get to participate.	<b>Inclusion</b>
<u>Raul and Manual</u> : Both (separately) noted that even though many people are elected to the committee, some end up not actually working on it. While neither Raul nor Manual had recommendations on how to fix this, Manual did excuse it, noting laughingly that the committee didn't pay much (nothing). Overall recommendation: Encourage more participation on the part of committee members.	<b>Work, checks and balances</b>

These concerns raised by the community members, in combination with my own critical ethnographic approach to focus them, raise the following 4 main issues:

1. **Knowledge**: The water committee, while it is elected by the community, does not necessarily consist of individuals who are trained in or knowledgeable about the water system. Furthermore, even if the committee member who is elected works to gain all information from training documents and paperwork left by the NGO, the scope of their knowledge, and gaining new and current knowledge, is difficult. The committee needs to work out ways through which they can preserve institutional memory and share that knowledge with others. The fact that elections occur every two years (a short period,



from an etic perspective) only compounds this issue.

2. *Operation*: Operational concerns are generally left to the operator, who is overtaxed and does not receive adequate training, assistance, or support. The inclusion of the water committee in operation may be a way forward, but so too would be the training and hiring of more operators or the improvement of community-level voluntarism. This is further discussed in chapter 7.

3. *Inclusion*: Inclusion in the water committee (especially related to gender) and in the management of WatSan overall is lacking. The water committee needs to ensure that people feel they can be included in the water committee and that they can be called upon for assisting with the WatSan system if there are issues. This is related directly to problems with voluntarism, discussed further in chapter 7.

4. *Longevity*: The committee needs to balance immediate WatSan needs (e.g. sufficient water pressure) with conservation and protection of water sources. For a critical take on the issues with implementing this type of plan, see chapter 6.

A key point to make with community members' perspectives on the committee, however, is that what people see might be very different from what is actually done by the committee. As an example, Isabel felt the water committee wasn't doing a good job. She knew the committee, and knew about the management scheme. She said that the operator came by to see what was wrong with each household. When asked directly, though, if she felt the committee was effective, her response was "I don't know, but I don't think so, they only go and clean the tank, that's it."<sup>28</sup> Objectively, the committee did much more than that, but her feelings were fair, because she only saw or heard about this one aspect of the committee, and she felt that this wasn't enough. While she didn't elaborate on what she thought they should do to improve (she didn't know), she clearly wasn't engaged or impressed by the management system. So, how can the committee first improve, and second make sure that public awareness gives them credit?

It should not be assumed that all people within a community know about or care about water committee management or effectiveness. To illustrate this, 28.6% of the respondents for the survey did not know even one person on the water committee. Furthermore, some interview respondents felt that they didn't really know much about the committee, or have any recommendations for them. That being said, much of Sapecho was very engaged in the

process of WatSan management.

Still, the community members, regardless of their participation level, didn't really address the two main issues with the system that I had garnered (infrastructure-wise): chlorination and wastewater treatment infrastructure problems. And, while wastewater treatment infrastructure problems were a clear concern for the committee, as shown in the president's foci, the water chlorination issue must be addressed more directly by all three stakeholder groups: the community, the committee, the NGO, and also, I argue, by the academy.

### **Gender in Management**

Gender equality and female empowerment, championed by USAID and ACIDI-VOCA in the implementation of the WatSan system in Sapecho, was both absorbed and resisted by the community in a variety of ways. The women's empowerment goals of these NGOs, as outlined in chapter 3, were not met in full. Instead, clear evasion techniques were seen. Adaptation of traditional gender norms to allow for women's "empowerment" in WatSan was partial at best. While on the one hand, there was largely a view that women *could* serve on the water committee (99.1% of survey respondents felt that women had an equal chance of being on the water committee as men), on the other hand women were stymied in their ability to take up an actual position in WatSan by existing marginalization, expectations of gender roles, and women's work.

Interview respondents provided detail on the specific position of women in the area, connecting sexism, gender roles, jealousy, and women's work tasks to lack of participation on the part of females. Participant observation further validated these assertions. I argue through this section that the position of women's empowerment and inclusion forwarded by the NGO actually further ingrained women's marginalization. Further, I address the fact that the ways in which the committee and community excluded women from WatSan management were

insidious and hidden, making them difficult to address through traditional monitoring and evaluation techniques.

Contrary to common assertions by the committee's members, no women were actively serving on the water committee in Sapecho. One woman was elected as president of the WatSan committee at the time of my pilot, and the same woman was a part of the committee during my dissertation work. However, while this woman was technically elected to the committee as president, in actuality a man *served* as president. From the implementing NGO's viewpoint, there was a woman president, thus checking the box for women's empowerment. Within the community, however, men remain in charge. While some residents reported past women members of the committee, and while the bookkeeper (a paid employee of the committee, not an elected member) was a woman, I did not see, in my two years in Sapecho, any true women's inclusion.

The reason for this exclusion wasn't because men were publicly excluding women, making them feel like they couldn't participate, or pressuring them not to be a part of the committee. There was no community-wide campaign to explicitly exclude women. That pressure was happening in the home. Women knew that, technically, they could participate. They knew that, technically, they had a right to be a part of the committee. But, gender roles were situated such that women didn't have the time, support, or confidence to actually carry out these tasks. In practice, women's participation was highly scrutinized. In the home, partners pressured women to stay out of the Watsan limelight by such means and assuming they might cheat if they traveled, or becoming upset when women left them at home with the kids, which should be a woman's job. Women, broadly, knew their rights, and knew that they should have access to WatSan management. But in practice, they did not have that access.

Two key issues here are women's work and the difference between private and public spheres. A human rights-based approach addresses the fact that the ways in which women's rights are expressed in the home are different from those expressed in public, especially when it

comes to their relationships with men. When NGOs propagate the idea that WatSan development “benefits everyone” and that it fosters “community togetherness” without interrogating who “everyone” leaves out, (in this case, women), the all-encompassing nature of this sentiment is harmful. This is similar to critiques of human rights as structures that occlude gender-based issues such as violence, public/private expressions of women’s lives, and sexual/reproductive rights issues (Speed 2009, MacKinnon 1994, Merry 2006a, 2006b, 2006c). Often, women’s issues are considered personal rather than public, although in Sapecho, the personal issues women faced with WatSan, such as lack of support at home, or women’s work expectations, were structural more than individualized. Delving even further, this imbalance of power between women’s and men’s roles in society is linked to the same neoliberal logics that put NGOs in charge of WatSan provision, in that market-based economies and forces are only functioning “because unequal relations in the household provide unpaid domestic labor buttressing the paid economy” (Ahlers and Zwarteveen 2009:415). To summarize, the barriers that women face in Sapecho, keeping them from participating in WatSan, such as work, household expectations, and relationships with their partners, are not *personal*, they’re *systemic* to the culture in which the WatSan system has been placed; and they’re even related to the neoliberal system that propagates WatSan development as a goal.

### **Policy vs. Practice: A Narrative Example**

*The first time I saw Doña Cara during my dissertation research, she was riding a motorcycle. She was dressed in sweatpants and a t-shirt. Somehow she managed to look very elegant. She rode right up to us when she saw us (we were an obvious gaggle of gringos and water committee members standing in the middle of the road). The committee greeted her like she was a famous public figure. “Here’s our president!,” they said proudly. And I’ll admit to being impressed. “Huh,” I thought, “gender seemed to be an issue in my pilot—but a woman as a president of the committee? Good stuff!” While*

*that first meeting was very impressive, and while the water committee members often said things like “ella manda” [she tells us what to do], I found that her position, in practice, was very different from what was advertised.*

*Cara wasn't actually serving as president. Her husband, recently laid off from his construction job, took up the mantle of the position. Cara and I got to know each other well, and she ended up, by the end of my time in Sapecho, speaking to me pretty candidly about the reason she wasn't president. She didn't have time, she was tired, she had all kinds of work to do at home, she had to wake up in the morning and cook, and then cook again, and then cook at night, and she had to take care of the kids, bathe them, pluck the chickens before selling them at market, and do the laundry, and work at her little business in town. Her life, fairly, was exhausting. When I asked her to describe her day-to-day life in Sapecho, she didn't answer with a list of activities, instead she described how she felt during the day; she said that she woke up and felt okay, but by the end of the day was so tired.*

*I asked her once if she thought that her husband would do that household stuff so she could serve on the committee. She just replied, after a surprised laugh, that he didn't like any of that, that he liked going to meetings and working and that was it. He didn't like cooking, or taking care of the kids, or doing housework. When I went to their house to bake cookies with Cara, her husband amiably (he was a nice guy) drew a line with his finger between the edge of the kitchen and the hallway and laughingly said—“I don't go in here!” So, her husband served as president, and she was introduced as president if necessary for appearance's sake.*

*The problem here was never that Cara couldn't do the job, she was brilliant, well-liked, thoughtful, and charismatic. The people, frankly, might have really elected her and not her husband (maybe partially because they knew the NGO rules?). But at the meeting before she accepted the position, she told the people she couldn't do it, that she*

*didn't want to, and she didn't have time, and so her husband would have to do it for her. They reportedly thought that sounded good. So, she took the spot. And her husband took the position.*

Certainly, the odds were stacked against Cara. She, of all the women in Sapecho, was actually elected president of the Water committee and *still* couldn't participate. Let's not forget, though, that regardless of the structural forces that made it difficult for Cara to take the role of president, *she didn't want the position*. She was pushed into it largely because of the requirements levied by the NGO and the expectations of the committee. She was at once forced into something that she didn't want to do and then excluded from doing it.

When I asked Cara if she felt as if all women had an opportunity to serve in the water committee, she said yes, but it was a qualified yes. She said "but one thing is that they don't want to, because it is a responsibility, they have to walk [all around and work], the time, too, it robs a lot of time."<sup>29</sup> Some women knew about Cara's position, too. Gabrielita summed it up:

*The woman who was supposedly elected president is missing, she has been elected president but has not exercised her position because she has to care for her children, has to do many things. Her husband has helped her with this, he replaced her. But I think that a woman should do the job.*

Cara's position wasn't a secret to the community, quite the opposite. However, in traditional monitoring and evaluation I think the nuances of her situation would have been missed. How many women are figureheads for NGO-enforced gender equality? I argue that this half-measure further ingrains women's inequality, further marginalizes their position within the community, and causes harm to individual women's social and private lives. While Cara's position is illustrative, I don't think by any means that it is unique. Many other women in the community reported similar issues and tensions.

## Women's Work

I asked several women why there weren't more women in management positions on the water committee. Monica gave a particularly representative and candid response:

*Basically, in this area, what I have seen is that the women work a lot, they work in their house, they work in their agricultural plots (they say in their land), all the time they're weeding, digging the weeds, they're pruning and reaping, and the men are stuck worrying about these things, too. But women have two jobs because they have a job in their house. They have to cook, care for their children, and after that go to work in their plots, and I think they don't have time for this [participation in WatSan], too...there are a few women who are stuck working with WatSan, like this they're part of the board meetings, but there are few women. There are more men.<sup>30</sup>*

Overall, the women who were "stuck" as a part of the water committee were often forced into one role: treasurer. Women were often perceived as more fair and responsible with money, and often acted as the budget-keepers for their homes.<sup>123</sup> As Abraham noted:

*Always here, the people say like, a woman is the housewife, and they put the woman in the role of treasurer, a little because the woman is always more protective/watchful of the money, more stingy, than the man. The man, he's always more loose [with money], and because of this they [the committee] put the women almost always—it has always been a woman, who holds the purse—they put a woman as the treasurer.<sup>31</sup>*

I'll add the situated and observed knowledge that the treasurer position was often one of the most difficult and time-consuming on the board, often held lesser esteem, and came with less travel requirements than the president and vice-president position. Further, while women would have been in charge of the accounting in this position, the decisions on how to spend the money

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<sup>123</sup> At the time of my research no women were serving as treasurer, but during my pilot work Cara was treasurer.

were committee-wide and often led by the president (usually a male).

Women are not the only ones frustrated by this division, nor the only ones who notice this incipient exclusion. Marc, one of the younger members of the community, was frustrated by the way the women were treated in the community, especially when it came to water. He noted that “in the town meetings, some people don’t give them much respect,”<sup>32</sup> and went on to state that “I think that people don’t have much confidence in the women, they’re really worried [about their participation].”<sup>33</sup> He felt that women were perfectly able to serve on the board and to work with the complex water systems. More broadly, too, some men encouraged and appreciated the need for women to work. The town has a female dentist whose husband supported her work (even though she still took care of the kids during the day). Women hold the position of president in neighborhood associations quite often. Nevertheless, the WatSan management was different; it took more time, it provided more opportunity for travel, and it was prestigious in a way that neighborhood associations were not, largely because of the relationship with ACDI/VOCA.

### **Women in Sanitation**

The potential position of women in sanitation provides an interesting perspective for women’s participation and is a potential area of inclusion for them. Wendy Wakeman argued that women are more likely to give value to sanitation services at the household level (1995), and this rang true in Sapecho. However, I found that some women in areas outside of Sapecho expressed interest in sanitation at the operator and management level as well. While Cara, for one, had never been to the wastewater treatment system due to the usual suspects (odor, difficult work conditions, and general unpleasantness (discussed further in chapter 7), other women expressed an interest in the paid position of the operator (from my fieldnotes):

*Toward the end of my time in the community, when the NGOs were on their way out and were making some (admittedly last-ditch) attempts at ensuring a somewhat sustainable*



*system of operation and management for their systems, they encouraged an operator-exchange between the prolific and knowledgeable Sapecho operator and up-and-coming operators from other towns. I was surprised to see two women there (after my experience in Sapecho, I wasn't expecting many women to be hoping to become system operators). After a time, though, it became clear that these women were distinctive in some ways. First, one was very young (about 17) and was looking for a way in the world that wasn't childrearing and homemaking. She had gotten interested in being an operator because it was an interesting, new experience that carried with it a salary and some attractive skills. The second woman was older, and had grown children. She was looking for the same things. What really set them apart, though, and made me wonder about their future inclusion in the process, was that neither of them was familiar with operating sewage/wastewater treatment systems at all. They didn't know what kind of work it entailed, they didn't know how bad it smelled, and they didn't understand the pressures that went along with operation and maintenance. To their credit, they trudged down to the system, dealt with the odor, and were still in on the operation gambit by the end of the tour. Whether or not they actually took the place of operator I'll likely never know, but the interest, I think, was enough. If women are interested in operation and maintenance (for whatever reason), perhaps this can be encouraged and supported. If so, this might be a back door for women's inclusion in the WatSan process. If they are in charge of operation, they may have an avenue to gain a voice and a place in WatSan. Of course, it could also go in the opposite direction, where women are marginalized because of that position.*

As I'll discuss in chapter 7, the operator of the WatSan system in Sapecho had several negative experiences and bore the brunt of much of the burden of the sewage collection and sanitation system needs. However, if the issues raised in that chapter are addressed *and* women can get

into the picture, it could have positive effects on women's roles within these systems. That being said, as sanitation and wastewater treatment issues now stand in Sapecho, the inclusion of women in that aspect of the system may just cause more problems. It is also a partial, not a full prescription for women's participation.

### **So What is the Position of Women in WatSan?**

As Melissa Crane Draper states, "[Globalization's] influences have come not only in the form of neoliberal economic policies but also with the influx of foreign cultures and ideas that challenge women to decide how they want to be leaders, mothers, wives, professionals, and members of their communities" (2008:213). This is certainly true in WatSan development in Sapecho. In Sapecho, while the challenges of WatSan are providing some interesting new possibilities, they also often cause negative effects and difficulties in women's home, work, and public lives. Cassandra Workman argues that, in her study in Lesotho, "women were interested in making the chores and daily water-related activities easier, not adding new responsibilities," and goes on to argue that understanding women's many responsibilities as well as their social support structures were important (2013:349). Workman also argues that men should be included in women's empowerment projects, as I have also argued from my experience in Sapecho, although the context and specific reasons vary between our studies.

WatSan practitioners must forward women's participation in more culturally-relevant and truly inclusive ways if they want beneficial effects. Little things could assist with this. For instance, one of the biggest ways that NGOs and water committees could encourage women's participation is to provide childcare during committee meetings and committee events. Another is to think about ways in which to include women in WatSan that don't wrench them into a position they don't want, can't participate in, and for which they could be criticized at home. Having women, who are chief in the management and use of water in the home, in the decision-making process for WatSan management more broadly is paramount, of course. Women as

operators may be an option, as I discussed above. Ensuring that there is a women's group that can meet during hours appropriate for women, with children attending, that can then relate their findings to the committee may be useful as well.

I would caution that the inclusion of women in WatSan may seem partial or imperfect at first, but we must remember that including women where they haven't traditionally been valued or seen is an incremental process. Further brainstorming and theory-building is necessary cross-culturally. My work in Sapecho is only a part of this. I argue broadly that NGOs and development professionals need to be careful and conscious about the ways in which wider policy impacts women in specific cultural and social settings. I give specific recommendations in chapter 10 about how they can do that. Simply put, NGOs must work with both women *and* men to achieve these ends. If this is not the case, I think it is safe to speculate that work-arounds to the spirit of women's empowerment and gender equality policies may be put into practice, sidestepping stated ideals of inclusion. This can and likely will cause more harm than good.

In this endeavor, too, we must remember that women's and men's lives and their ability to participate in WatSan management do not solely hinge on their gender. Other status markers, such as age, ethnicity, and economic status, may also impact their ability to be decision-makers in WatSan. In encouraging gender inclusion communities and NGOs should also encourage attention to intersections with other markers.

### **Age, Ethnicity, and Other Status Markers**

I asked survey respondents and interviewees alike to address any issues with age, ethnicity, or income in the WatSan process. Through participant observation I was made aware that renters and migrants were also lacking in access to WatSan management opportunity. This section summarizes the problems and issues emergent in each of these theme areas.

## **Age**

While older people were not required to be part of the committee, they generally felt they could participate if they wished. Young people without their own households were not included in the committee election process as they did not pay a water bill in their name and were not considered part of the WatSan management pool. Ageism in WatSan management was somewhat common on both sides (regardless of their buy-in to the system and perspective on possible inclusion), applying both to younger and older members of the community. While 64.3% of the respondents in Sapecho proper felt that people of any age had an equal chance of being on the water committee, 35.7% of respondents felt that the chances were not equal. When asked why all ages didn't have the chance to serve, "very young" and "very old" were noted as reasons, with both groups being attributed as not having the capacity, the responsibility, the caution, the intellect, and/or (for the elderly) mobility and strength to do the job. One respondent actually argued that the very old were boring, and so they couldn't serve. The old also, reportedly, "can't walk and can't solve problems." On the other side of the spectrum, the young were thought to lack "responsibility or conscience." More practical concerns, such as peoples' health, their status as students, and the fact that the work is heavy and difficult were also raised. It is interesting that these concerns, while common in the survey, were actually not raised in interviews. Age was not cited as a deciding factor for WatSan committee participation in this respondent group.

## **Ethnicity**

Ethnicity was not a clear indicator of inclusion or lack of inclusion in water committees. For Sapecho as a whole, being a community of settlers, ethnicity was often downplayed. Of the respondents in Sapecho proper, 95.5% felt that all ethnic groups had an equal chance of being on the water committee. Of the 4.5% of respondents who argued that opportunity was not equal amongst ethnic groups, the given reasons did not directly address a certain group, but instead reinforced the difference between Sapecho residents and those who were not

“*socios*,” (members of the community who had bought into the water system) and argued that only those from Sapecho had a chance of being elected. These responses reflected tensions between regional and ethnic identity as discussed in chapter 4, but they did not reflect exclusion based on a certain ethnic group. As a reminder, many in Sapecho didn’t really identify with their ethnicity, and indigenous politics weren’t front and center in Sapecho residents’ daily lives. Many intermarriages existed between Quechua and Aymara groups, and between these groups and Afro Bolivians. Friendships weren’t drawn along indigenous or ethnic lines, either. I saw no obvious exclusion by ethnic group in the case of Sapecho’s water committee. The only exception to this that I observed was that some older people who still spoke their indigenous languages more often than not, or who didn’t assert themselves well in Spanish (although they could certainly speak it if given time) were bowled over in conversation, which intersects with the ageism discussed above. While I can’t say that these people were left out of the committee process for this reason, I could see it being a concern. Furthermore, I would caution that while ethnicity was not a clear marker of inclusion or exclusion in Sapecho, this aspect will differ by cultural and social context, and has been noted as key to the study of WatSan management exclusion and issue in other studies (Allen 2006b).

### **Income**

Income was not a clear barrier for being a part of the water committee in regard to overt classism, although some economic classes were left out because of wider structural barriers. People often noted that being loud was more important than being rich in the meetings. That being said, participating in the water committee was at times expensive, since it prevented people working their fields on certain days, added to workload, and came with travel requirements and potential fines for not showing up for meetings. While people of lower income were welcome to participate, their everyday struggles gave reason for them to choose not to participate. Time, work, and adequate funds to participate in the WatSan management

committee were also problematic for individuals of lower socioeconomic status. While the majority of survey respondents (91.1%) felt that people of any socioeconomic background had an equal chance of serving on the water committee, 8.9% of respondents (10 individuals) felt that certain socioeconomic groups did not have equal access. These respondents felt that people of lower economic status couldn't participate due to lack of money (n=4), time (n=2), capacity (n=2), interest (n=1), and participation (n=1).

### **Renters**

Renters/people who were not homeowners were left out of the water committee and water management altogether. Because they were not *socios* (people who had bought into the water system) they didn't have a voice in meetings and they didn't have the opportunity to serve on the water committee. This, for me, was a clear area of concern. Not only were these people left out of the water committee, they were often the ones who had the most difficulty using, accessing, and paying for water at the individual level (as discussed in chapter 5). This was also an issue that was an intersection with individuals of low economic status and young age. Sebastian explained the situation of renters well: "no, no, I don't have that right [to vote or participate in WatSan]," he said, "I'm not part of the town."<sup>34</sup>

### **Is the Committee Representative?**

When asked if the committee overall was representative, results were varied. Of the respondents from Sapecho proper, 13.4% felt that the committee was not representative (with only one group represented), 19.6% felt that it was mostly one group represented, 10.7% saw a little diversity within the group, 25.9% felt that there was a lot of diversity within the group, and 30.4% felt that the committee was very representative and respectful of difference (see figure 20). I have discussed several groups who were not represented in the Water Committee, and have interrogated the committee's structure from an approach which looks at marginalization

and difference. It is important to note that many within the community also perceive the committee as not very diverse, and while many share this view, the system has not changed.

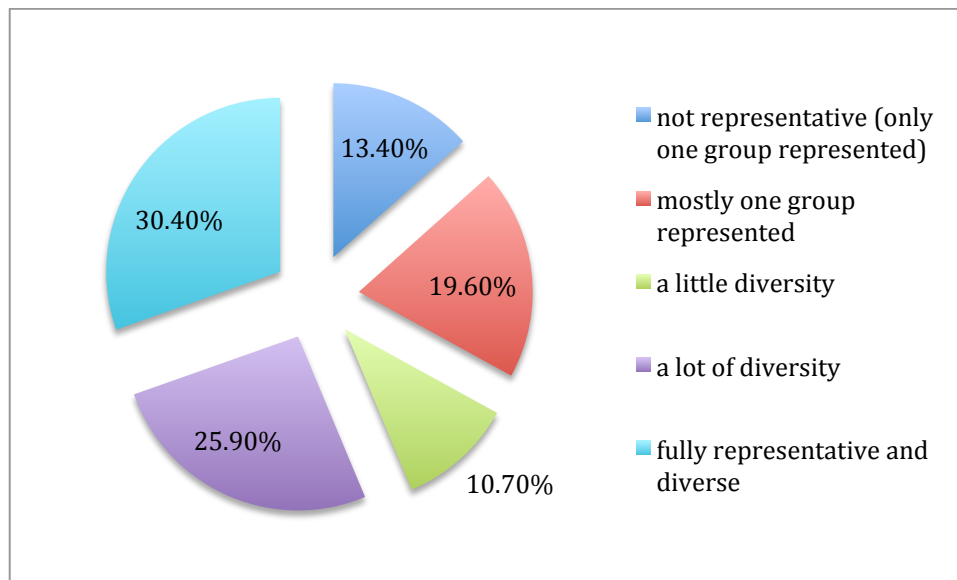


Figure 20: Do you feel the water committee is actually representative of the community?

The many missteps and criticisms of the WatSan model, and its distinct inability to ensure effective inclusion and equality amongst community members in Sapecho, requires that we ask the difficult question of whether or not the committee model is effective. Certainly this shouldn't be decided by its propensity for inclusion alone, but also by its ability to ensure effective WatSan coverage, which I discuss in the following section. That being said, the extent to which inclusion and equality affects coverage, and the extent to which coverage affects inclusion in WatSan management, is a complex theoretical question. I argue that these aims (inclusion and coverage) are mutually constituted, but that social concerns of inclusion in management have as of yet played second fiddle to coverage concerns. I also argue that this imbalance has been detrimental within the WatSan process. The extent to which these concerns can be balanced by water committee models will be central to understanding their effectiveness in WatSan provision.

## **Effective Coverage**

This section addresses coverage from the WatSan system at the community level, specifically related to who had physical access to the system infrastructure and who did not.<sup>35</sup>

### **Water Access**

Access to the water system was not a concern for most of Sapecho's residents. With the exception of the individuals who had access issues because of cost or status within the community, there was not a widespread infrastructure-based or water availability issue with household-level water hookups. Migrants were the one group that had problems with infrastructural access.

Water access through the WatSan system, even for new migrants, was expensive but affordable. In migrant areas, however, I did notice a lower standard of water infrastructure; often these families had only a spigot and not a full sink, drain, etc. When migrants did not have access to water, a neighbor often allowed them to access their water (although at a cost). Abraham explains this clearly, that when people don't have access to the water system, they get water from "their neighbor, their neighbor gives it to them; at times, too, they get it, but the neighbor doesn't give it to them. Instead, they pay the neighbor, because everyone has water meters."<sup>36</sup> From the survey, of those respondents who knew migrants to the area (n=64), 64% responded that the migrants they knew had access to the system, 6.4% said they borrowed from others, 14.1% didn't know how the migrants got water, and 8.7% argued that the migrants would have to buy into the system or go to the river. I would caution here that Sapecho is a relatively water-rich area, and would say that water sharing might be a more difficult business if scarcity were an issue (as is chronicled in studies in Chochabamba, Bolivia, Wutich and Ragsdale 2008, Wutich 2009a,b).

### **Sanitation Access**

Sewage collection and wastewater treatment access was much more partial and difficult



to obtain than water access. First, not all people in Sapecho were included in the sanitation system to begin with, as some were not in a location that would feed well into the wastewater treatment system (i.e. the gravity-fed system of sewage collection wouldn't work for their house). Others opted out due to cost from the beginning, and instead relied on improved pit latrines or other latrines already constructed on their property. The communities surrounding Sapecho proper (29 de Septiembre, Brecha A (represented in the survey and Figure 21) as well as all others along the megaproject line (see chapter 3's "A Project Description"), were not a part of the original sewage collection and wastewater treatment project. The point-maps (Figures 21 and 22) show who is without sanitation coverage (red) and who has sanitation coverage (green). As can be seen, coverage is limited to the main areas of Sapecho proper, and is not afforded to individuals that live out on the main road, except for those across from Sapecho Proper's main community. It is also not afforded to newer migrants, as noted on the zoom of the areas where new migrants are living (Figure 22), known as "Nueva Esperansa." Missed by even this map, though, are the people who live in a small emergent community to the left of Sapecho proper, shown in a participant-led map in the growth and migration section of this chapter. People to the left of the main neighborhoods, but who still lived in Sapecho proper [pictured] did not have access to the sanitation and sewage collection system due to topography.

The disparities in centralized sanitation access do not necessarily mean that the individuals in these households did not have access to any sanitation whatsoever. Homes without centralized access either had improved or unimproved latrines (commonly referred to as "posos" either way). Still, the benefits of the flushing toilets and sewage removal afforded to those connected to the centralized system were often far superior, both in experience (e.g., smell, seated defecation) and functionality than latrines, and individuals without access to the system noticed their relative inequality, although were usually fine with using the latrines, as

they always had. The benefits of sanitation overall, as reported by the community (see chapter 7), make the argument for better and more equal access.

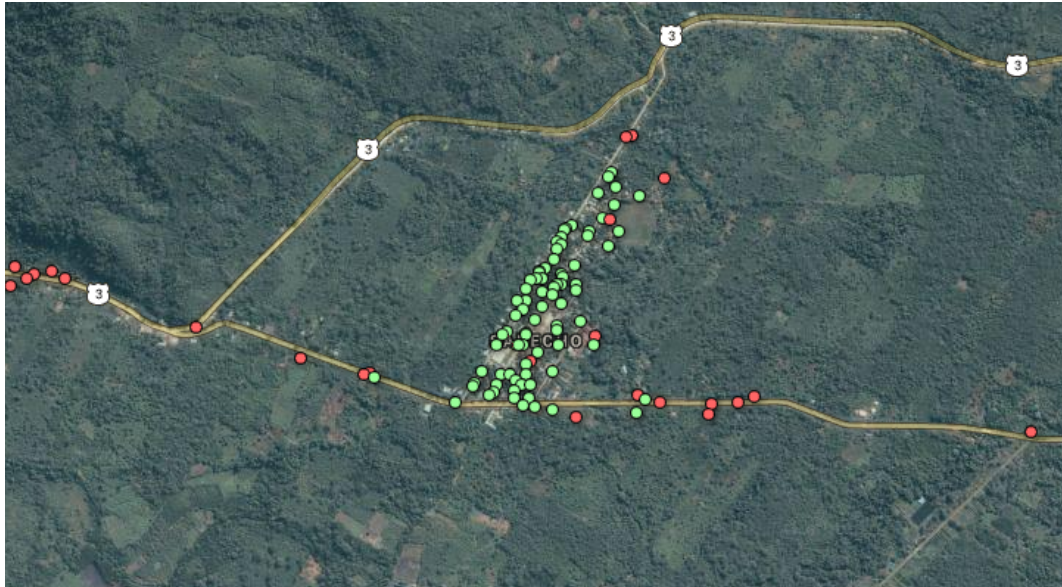


Figure 21: Point Map of Sewage Collection and Wastewater Treatment Coverage

**Red:** No Access  
**Green:** Access

The water committee and the operator were in charge of ensuring that the water system not only worked for those who had access, but also was expanded to include new migrants. They were able to do this for the water system, but were unable to ensure access to the sanitation system. However, their ability to keep up with migration, especially as it is growing rapidly in the area, is unsure, especially because connecting new users to the sanitation system is, at the least, \$800 per connection (Fuchs and Mihelcic 2007). Sanitation will continue to be a problem.



**Red:** No Access

**Green:** Access

Figure 22: Point Map of Sewage and Wastewater Treatment Coverage, Sapecho Proper

### **Detailing Growth and Migration**

From the more participatory and exploratory aspects of my study (participant observation, interviews, participant-led mapping) it was clear that the city of Sapecho was growing rather quickly, and that this growth was impacting WatSan management. Two participant-led maps really drove this home, and showed the ways and locations in which the town was growing (see figures 23-25). Participant-led mapping was conducted with a Livescribe smartpen, with which I could record the narrative surrounding the map's illustration in real time. This helped in a couple of ways. It showed importance (e.g. what people told me to draw first and what they told me to draw second), and it also ensured that the mapping worked

both as an informal interview and heuristic tool. It is fair to say that my first pass at these maps was more investigative than product-worthy, so I show each map side-by-side with a cleaner, simplified version drawn upon my return from the field. I will note that even though these look like scribbles, it was in this exploratory hand-drawn way that I gained necessary and “hidden” information about who had sewage collection and wastewater treatment and who did not, and which areas of Sapecho were growing, and thus it was integral to my research process.

The first map (Figure 23) shows one participant’s explanation of migration and growth in the area of Sapecho overall. The respondent explained that Sapecho was growing out in all directions, but also noted new migrants in the area of Nueva Esperansa (detailed by another respondent in Figure 24) and the area behind 11 de Noviembre (shown in Figure 25).

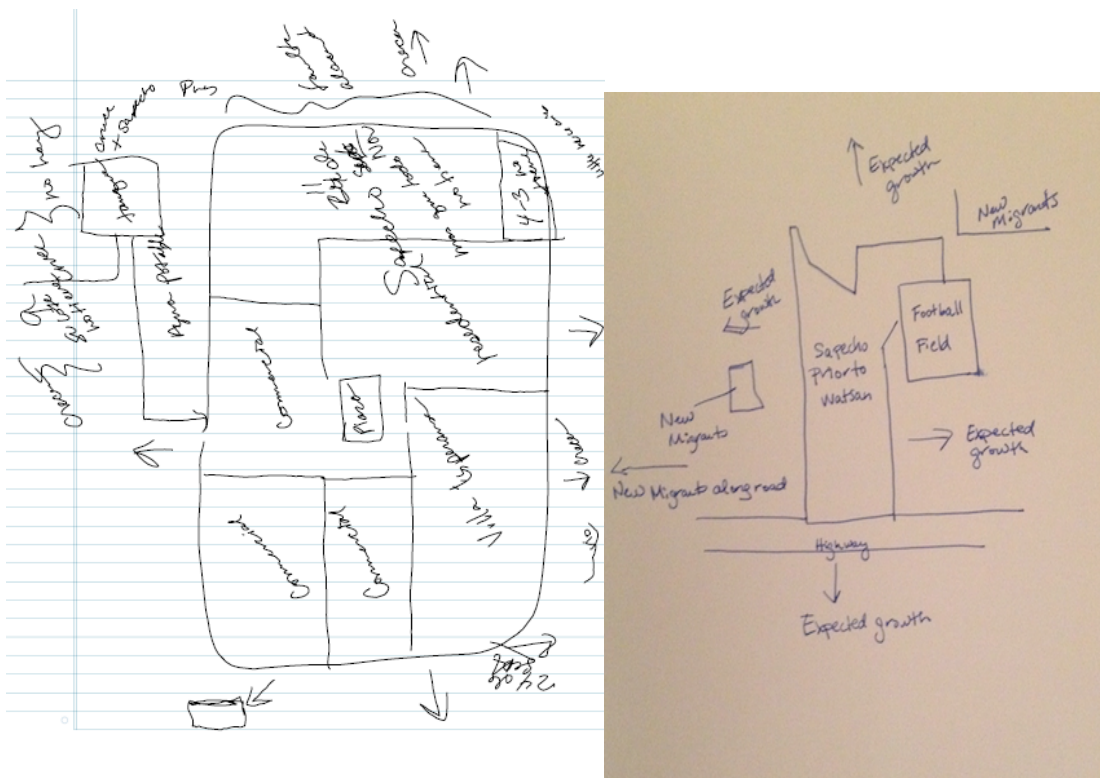


Figure 23: Exploratory map of WatSan and Migration, Sapecho Proper

The second map (Figure 24) outlines the growth around the edge of the residential neighborhood, called Nuevo Esperansa. This neighborhood’s lack of sewage collection and

wastewater treatment connections shows up on the heatmap from the KoBo survey, but this map, detailed by a member of that community, shows the specifics of the migration growth in the area.

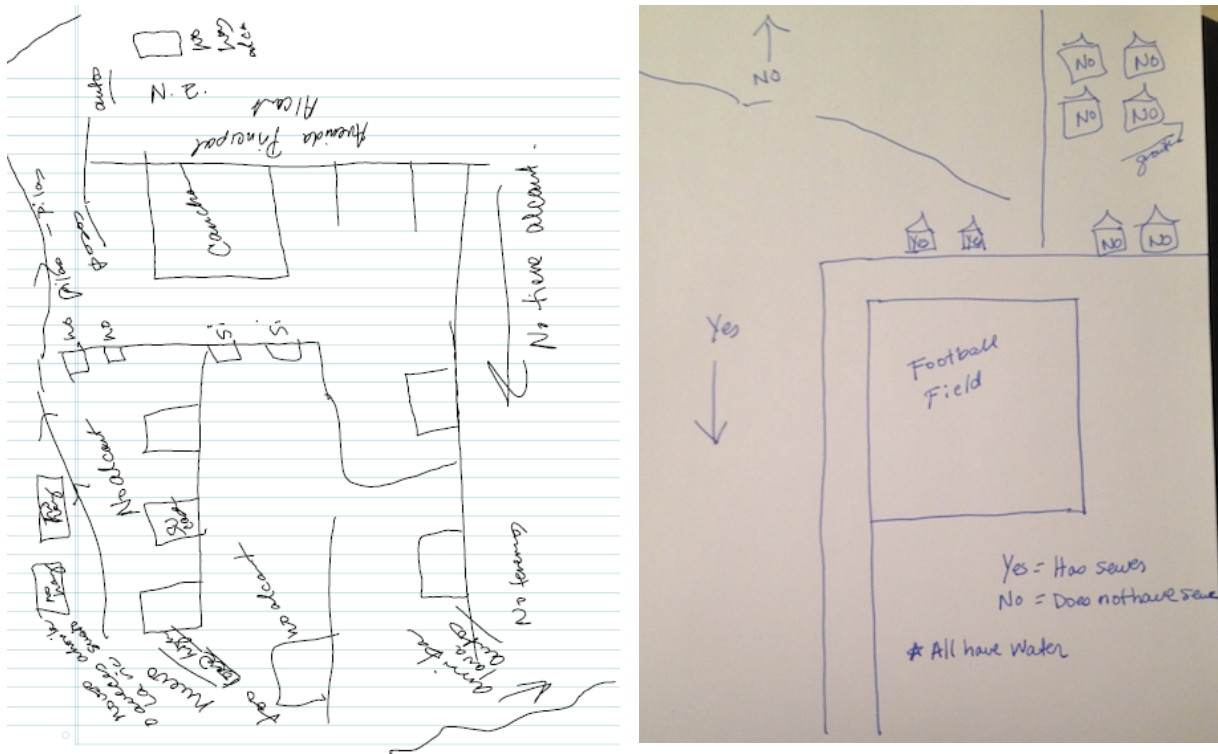


Figure 3: Exploratory Map of WatSan and Migration, Nueva Esperansa

The third map (Figure 25) shows a zoom in on the small community which was growing behind 11 de Noviembre (already a newer part of town). This portion of the community was hidden and under construction, being invisible to the main road, requiring walking through peoples' backyards to get there, and not really acknowledged by much of the community, since only one family actually resided there at the time), and the residents' condition was missed by the survey. Only upon fortuitously meeting a woman who lived in the fledgling neighborhood was I informed of the little cluster of homes. She explained the community's residents were new



migrants, explained that they did not have sewage collection connections, and showed me around her brand new home.

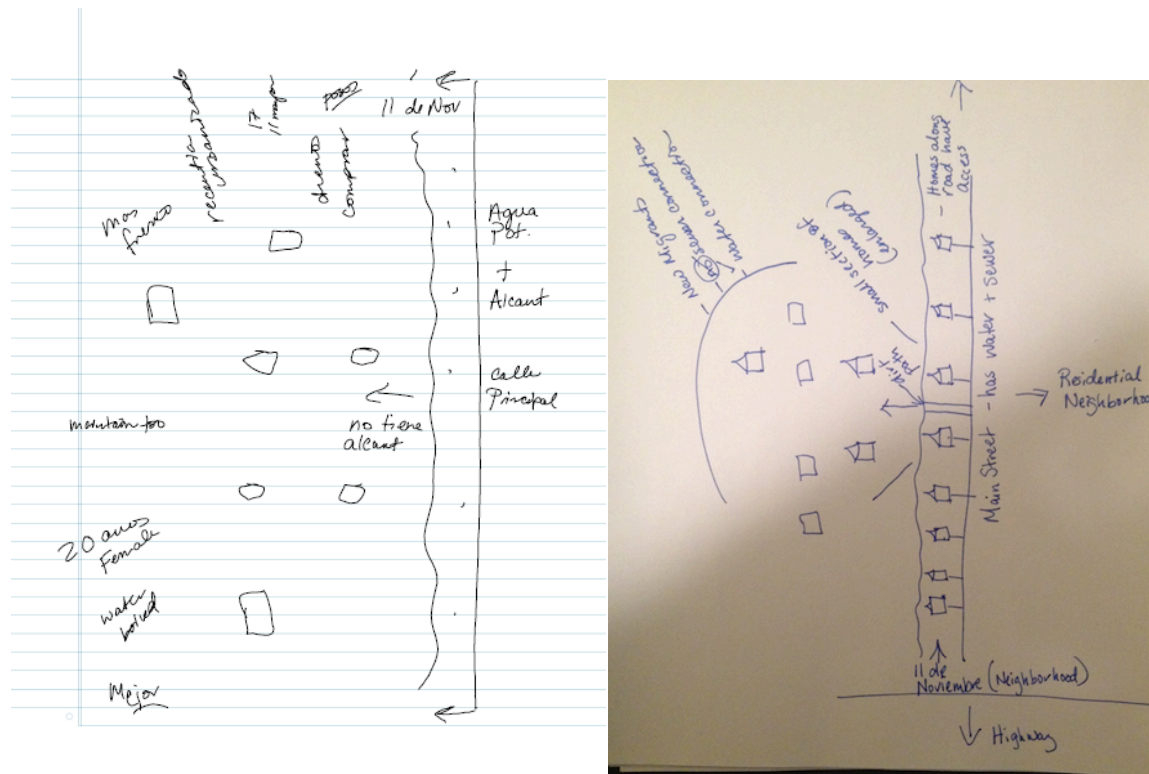


Figure 4: Exploratory Map of WatSan and Migration, New Neighborhood

Each of the maps was completed with either someone familiar with the entire system (e.g. the first map was completed by a committee member) or by a person who lived in the area they were representing. The mapping was done in a targeted fashion to show the position of people who may not have been widely evident in other aspects of WatSan management, or who may have gone unseen by parts of the population.

Migration to Sapecho was widely recognized as contributing to population growth, was often linked to peoples' interest in the WatSan system, and was often cited in discussions around the state of the community and pressures on its resources. There were a wide variety of factors to which participants in my study attributed this migration, one of which was access to

WatSan. Respondents in the study often made this link themselves, while I asked others directly whether or not people had moved to the area because of the water system. Respondents pinpointed migrants from Palos Blancos as well as smaller communities higher in the mountains as those who came for water. In Palos Blancos the water system has been failing, and in areas higher up they had electricity but no improved water access (see chapter 8).<sup>124</sup> Jhulissa states: “before we had 4 different neighborhoods; this neighborhood here is new, and here across there are a bunch of new people. It is because here the water is secure, on the other hand Palos [isn’t secure] for now, especially with the heat.”<sup>37</sup>

However, others, like Victor, felt that the influx of migrants to Sapecho could be better attributed to the lack of work in other sectors. Horatio felt that it was partially due to the increase of students because of UMSA and to work options as well. Still, most respondents felt that the WatSan system was a chief draw for new migrants.<sup>125</sup>

Migration may likely be one of the greater challenges the water committee will face. Lyla Mehta et al. found that migration was a taxing and difficult component of management for water committees in periurban Bolivia (2013:6), and in Sapecho I expect it will be no different. The choices that the water committee makes about migrants will continue to affect WatSan users in the community, and this only continues to highlight the already-existent issues with the WatSan committee related to inclusion and representativeness. The committee could also marginalize migrants, leave their voices out of choices related to WatSan provision, and stratify the health and personal benefits provided by the system — but if managed correctly, and alongside improvement of existing marginalizing policies, the committee could adequately open up to this new group.

### **A Note on Garbage (Solid Waste) Removal**

Garbage removal, or should I say lack thereof, was directly related to individuals’

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<sup>124</sup> Access to the river, however, was widely available and the amount of water was plentiful.

<sup>125</sup> 21 of 22 respondents who spoke to migration issues felt that water was a key draw.

concerns about sanitation, wastewater treatment, and general care for the environment in Sapecho. Garbage removal was an emergent concern in the work of Stacy Pilling in Mexico, and is commonly an issue in Latin America in general (Pilling 2011:1014). The water committee, which used to collect 1 boliviano per month to facilitate the garbage removal, has, since my pilot a year ago, let that service lapse. No municipal garbage collection scheme exists. People either burn it or throw it in the river, or toss it behind the government building. From my fieldnotes:

*I ask the woman sweeping where I can find a place to throw my trash, genuinely curious. At the house where I've rented I've received no instruction. We've taken to throwing the little black trash bags in the abandoned sink in the back yard, hosing them down with bug spray before we do. I'm sure, convinced even, that this is a terrible idea—but I don't have a better one. The only other options I've heard to this point are to burn it or to throw it in the river, and I'm sure I'd burn the place down if I tried to burn the trash, and I'm sure I would never forgive myself, as an environmental anthropologist doing a water project, if I threw my trash into the river. So, as for now, old abandoned sink it is.<sup>126</sup>*

*I look down at her feet while she replies; her sandals are tied together with jute twine where the buckles once were. They're cheap pink-and-purple plastic things. Everything here seems to be imported from china or old clothes from the states. A shame, really. Or is it? I don't know. My point is that reuse and mending is widely common, and I would argue that everyone makes a lot less garbage than we're used to in the States.*

*She tells me in reply that there is a service, well, there was a service, but right now*

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<sup>126</sup> I know, I know.



*it doesn't really work. That right now they just collect it and throw it behind the government building, and that I can do that, too.*

I argue that in the case of Sapecho, there are pressing and urgent needs to handle garbage. The water committee is a good group to handle this responsibility and has done so in the past. However, managing garbage, especially in rural areas and with limited, stressed funds, was difficult. While certainly it would be preferable for local government or national government to provide this extremely necessary service, it just isn't feasible in Sapecho. NGOs, instead, should work to integrate garbage removal as part of the focus of their WatSan projects and work, as best they can, to facilitate a way to handle that garbage. Without this service, members of the community are driven to throw their trash in the rivers. This both harms the environment and negatively affects water users in the wider waterscape for those who don't have access to the water system (or whose access is partial or limited). Garbage removal is directly—not tangentially—related to the long-term health of the WatSan system.

### **Critical Approaches to WatSan Management in Rural Areas**

Ahlers and Zwarteveen argue that water knowledge and practice is “written from the perspective of those who are in positions of control: planners, administrators, managers, policy makers”(2009:416). These knowledge bases help those in power reach their own water objectives, and prop up neoliberal attempts at water development (The creation of water committees makes a new seat of power within local communities with both positive (e.g., water is allocated) and negative (e.g., lack of inclusivity and overuse of power) effects. I've shown through this chapter that, in Sapecho, some groups are left out of the management of the WatSan system. Women are edged out of management when they are the ones most intimately tied to water use and management. The poor, young, elderly, and people who rent their homes are also left out, and these are some of the same groups that are experiencing limits on their use of the water from the water system.

True inclusiveness in WatSan management does matter, and in Sapecho, as in so many other WatSan locations, inclusion was not realized. This not only hurts individuals in that if issues of marginalization and concern go without being voiced and without being addressed, as I argue here, it hurts the overall effectiveness and longevity of the WatSan system (McConville and Mihelcic 2007). Other emerging concerns, such as migration and garbage removal, present new obstacles for WatSan managers, but also present opportunities for NGOs and communities to work together to make appropriate choices. Training, too, is key, for both the water committee and the community. Fuchs and Mihelcic noted that where more money was spent on training, better WatSan outcomes were seen (2011:113).

The way that WatSan is managed, and the extent to which that management is representative, accessible, and perceived as effective, will be a continuing concern in WatSan development. While I do not necessarily advocate for the discontinuation of the water committee model, I do feel that my work on the ground raised areas of concern, and that the model needs to be questioned. Beyond the structural and conceptual critiques of the water committee in general, emergent areas of concern from my specific study included the committee's potential for over-use of power, unclear responsibilities vis-à-vis new development projects and opportunities, management-based tension between infrastructure upkeep and individual use and inclusion, marginalization of women and other groups, difficulty ensuring new connections for migrants, lack of technical expertise (especially an inability in managing sewage collection and wastewater treatment), and problems with garbage removal. Aligning committee and NGO foci to these emergent concerns, and not just the "by the book" requirements of agency policy, will be important. Beyond this, attention to managing human need with wider issues of conservation and infrastructure upkeep is in the hands of water managers, largely unequipped to handle this responsibility. As the needs of a system will continuously change, and as the NGOs won't be around forever and may not have all the answers to which aspect is more important, there is a large conceptual gap to be filled and focused on by the academy.

Creating frameworks from which communities can choose priorities during times of WatSan struggle, and creating relationships and support networks for those managers, is important. A clear starting point is ensuring that all community members truly have a voice in management decisions.

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<sup>27</sup> Supongo que sí, no sabemos que alguien se haya enfermado, por eso.

<sup>28</sup> No sé, porque no creo, solo van a limpiar el tanque, nada más.

<sup>29</sup> Sí, pero, uno es que no quieren, porque es una responsabilidad, caminar, el tiempo también...te quita mucho tiempo.

<sup>30</sup> Por lo menos en esta zona yo he visto que las mujeres trabajan mucho, trabajan en su casa, trabajan en sus lotes que dicen sus terreno, todo el tiempo están deshierbando, quitando las hierbas, están podando, están cosechando, y los hombres están, más en otras cosas metidos también, pero las mujeres tienen doble trabajo porque tienen en sus casa, tienen que cocinar, cuidar a sus hijos, después ir a trabajar a sus chacos, y no tienen tiempo creo para eso más...y son pocas las que están metidas, así en reuniones que son de la mesa directiva son pocas mujeres más son varones.

<sup>31</sup> Siempre aquí, la gente como dicen, la mujer es la ama de casa, y a la mujer la ponen de tesorera, un poco siempre es más celosa la mujer al dinero, más agarrete, mientras que el varón, siempre es más suelto, y por eso les ponen a las mujeres casi siempre de...siempre ha sido mujer, la cartera de...la ponen de tesorera.

<sup>32</sup> Que deberíamos respetarlas también, porque en las reuniones del pueblo, no les dan tanta importancia algunos.

<sup>33</sup> Creo que no les tienen tanta confianza a las mujeres, creo que tienen muchas ocupaciones.

<sup>34</sup> No, no tengo derecho...digo, no soy parte del pueblo.

<sup>35</sup> Other portions of my work have critiqued the intricacies of access to water even if infrastructure did exist (chapter 5), and I do not address these here.

<sup>36</sup> Del vecino. El vecino les regala. A veces también recibe, bueno no creo que les regale, creo que también pagan porque están todos con medidores.

<sup>37</sup> Sí, sí, porque antes no teníamos nosotros los 4 barrios, este barrio de aquí es nuevo, ahí atrás hay varios que son nuevos, porque aquí el agua es seguro, en cambio de Palos Blancos por hora nomás, y con el calor.

## CHAPTER 7:

### SANITATION, SEWAGE COLLECTION, AND WASTEWATER TREATMENT

Sanitation and sewage collection has been understudied in Anthropology (Alley 2004), but the ubiquity of sewage demands that attention be paid to its interaction with populations and people, from both a practical and cultural viewpoint. This chapter is aimed at adapting current theories of political ecology and water and culture to the study of sanitation, sewage collection, and wastewater treatment. I also address other disciplines' viewpoints and theories (Allen et al. 2006a, 2006b, McConville and Mihelcic 2007, Schweitzer and Mihelcic 2012) on WatSan and I work to generate my own theoretical framework which marries current viewpoints. I present a study of the problems that I saw on the ground in the Sapecho system, related to management, upkeep, and wastewater treatment breakdown. I use thick description and an ethnographic vignette of the system's operator in order to address some of the concerns of the sewage collection and wastewater treatment system. Following this, I explain the issues seen with the system (introduced in the last chapter), and address some of the main concerns for development professionals and communities alike. This chapter takes issues of sanitation, sewage collection, and wastewater treatment from the broad theoretical lens to the practicing, community level and then back again—all with the aim of a praxis-based approach.

Ensuring that this discussion is infused with Bolivia-specific concerns and foci is a clear goal in this chapter. The sanitation (sewage collection and wastewater treatment) landscape of Bolivia is dire, especially in rural areas. In the country, four in every five rural Bolivians does not have access to sanitation (Aruquipa 2008), and coverage schemes are inappropriate in some locations (Verbyla et al. 2014). Bolivia's laws explicitly outline the ways in which individuals should handle and treat wastewater, but as with many other conservation laws, Bolivia is an

example of “abstract law and concrete violations in every area” (Farthing Nd). Sanitation, sewage collection, and wastewater treatment will only continue to be more important as the global population continues to rise, and as water scarcity and water problems continue to increase. Bolivia will likely see these tensions come to a head more quickly than other areas where water is not already such a hot-button topic and scarce resource.

Through my approach to this chapter, I address and explain my main findings related to sanitation (again, the term sanitation refers to sewage collection and wastewater treatment both), and parse out differences in perception and management of the two components of sanitation. My main goals are to address the following emergent themes:

1. The way that people interact with sewage collection and wastewater treatment at the individual level is culturally situated.
2. Peoples’ perceptions of sewage and wastewater, as well as their senses, all affect their ability to work with and support sanitation systems.
3. Sanitation maintenance and upkeep concerns are divergent from the concerns of potable water maintenance and upkeep: specifically, maintenance of these systems is more difficult and personally dangerous.
4. The management of these systems can be left to marginalized individuals, or in the case of Sapecho, to one individual, completely.
5. Lack of attention to the intricacies and difficulties of sewage collection and wastewater treatment management leads to ineffectual programs and harms the environment.

In order to outline these findings, I have separated this chapter into five sections: 1) using sanitation, 2) perceiving and sensing sanitation, 3) managing sanitation, 4) operating sanitation, and 5) addressing sanitation. This is preceded by a focused discussion of theory related to sanitation issues.

### **Addressing Sewage Collection and Wastewater Treatment Research**

Sewage collection and wastewater treatment research, perhaps more than any other part of my study, required a keen and honest anthropological eye. So much of the sanitation process, from how people use the bathroom to how people handle human waste, is hidden. It is curious, really, to think back on some of the conversations that I had about sewage over the course of my dissertation. “Please could I see your bathroom?” was a common question for me

to ask, and while the request was often well received, (maybe because I already had achieved some rapport) it was also a bit unexpected. As a biological imperative, human defecation and urination are universal. But the ways in which these practices take place, and the technologies and infrastructure that people access to defecate and urinate, vary greatly by cultural context. So too do individuals' perceptions of and comfort with discussions of and questions about feces, urine, the water that flushes it out of their homes, the wastewater that it creates, and the treatment of that wastewater. Inserting social theoretical constructs into the current academic look at sewage collection and wastewater treatment is imperative, and yet anthropologists have been widely absent from that discussion (see chapter 2, 10).

I would argue that not many anthropologists have made the jump to sewage collection and wastewater treatment research for the same reasons that most people don't want to work with sewage. First, it is seen as unpleasant, and second, it is difficult to get people to talk about it. As one of the development professionals I spoke to simply told me – “nobody wants to be a plumber.” While interest in wastewater is not widespread, interest in the other side of that coin — in clean water — is certainly high both in the discipline and with humans as a whole. Connecting sewage collection and wastewater treatment to the wider water discussion in anthropology is a logical piece of the clean water puzzle, and is a part of the process of ensuring clean, adequate, drinking, bathing, and cleaning water to all.

The problem with connecting water and wastewater issues goes far beyond the academy. If asked what happens to their sewage after they flush it, many Westerners might answer that they don't know, or perhaps that “it goes away.”<sup>127</sup> Waste and wastewater treatment is a highly specialized, highly removed sector in the west. People don't think about where their water comes from in the first place and most don't know what happens to it once

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<sup>127</sup> This is research that I would very much like to conduct, but I think it is safe to call this about right. In my work in Belize, after this dissertation project, I did ask this question to a small sample of US tourists in my ethnographic encounters (it was a big interest and vote of mine to include this in the work). Most did answer thusly. But, I would also call this common knowledge.

they flush it. In much of the developing world, this lack of attention and interest in sewage collection and sanitation issues is just as present, especially when the built environment is constructed such that these issues go unnoticed by all but a select and specialized few. In cities especially, infrastructure that handles wastewater has been integral to urban sustainability (Monstadt 2009: 1924). In other areas, where no complex urban infrastructure exists, and especially where there is a problem with the handling of human waste, sewage is a constant issue.

NGOs have begun to address rural problems with sanitation through WatSan projects, and have often put fledgling communities in charge of complex sanitation and wastewater treatment infrastructure contingent on centralized living in an urbanizing setting. The ways in which communities perceive and handle this infrastructure, as well as the waste that enters it, is of chief concern to me as an anthropologist. Constructing the theories with which to address these issues is necessary.

### **Terminology**

I was torn about what terms to use to refer to sanitation issues in my work. On the one hand, I feel that it is important to appreciate the value of waste and wastewater by highlighting two things, water and nutrients, both of which are contained within wastewater. One way to highlight these components is to refer to treated wastewater as a reclaimed resource (I discuss the issue of terminology further in chapter 7i). Ensuring that wastewater is transferred into a resource through wastewater treatment takes infrastructure. What's more, the production of waste at the household level, and the treatment of waste at the wastewater treatment plant, requires interaction with untreated waste. The people in my study, and in my life writ more broadly, certainly did and do not interact with or address sewage as a reclaimable resource; they interact with it as waste.

It would take a change of mindset and a change of perspective for many individuals to

address wastewater as a reclaimed resource and not a horrible foul mess. Wastewater is and should be addressed as a resource, but I find that in order to study humans in settings where new sanitation systems are implemented, the waste element must be addressed clearly. I want to be upfront about what terminology I use in my treatment of these issues. “Sewage” refers to both feces and urine. I use “feces” or “urine” when I want to get specific. I use “wastewater” for the combination of feces, urine, and flushed grey water (shower and kitchen water). When I talk about wastewater once it has been treated by the system, I speak of it as “effluent” or “treated wastewater.”

In this chapter, I theorize about and present the ways in which people perceive sewage, wastewater, and wastewater treatment. I look at peoples’ perceptions, practices, thoughts, and asides when it comes to speaking about these concepts. The concept and theory used to look at treated wastewater as either “reclaimed resources” or just “water” (if treated to drinkable standards) are intriguing. Anthropologists must work to marry the lived experience of using sanitation infrastructure with the benefits of wastewater as an environmental and social good.

### **Focus on Theory**

Much of anthropological theory on sanitation, sewage collection, and wastewater treatment has yet to be developed. I use a variety of literature, from anthropological looks at toxic waste, water use and reuse, and infrastructure/technology in the fields of political ecology and water and culture in order to address the theoretical components of sanitation, sewage collection, and wastewater treatment. In this chapter, I also intend to generate theory. In the conclusion, I discuss working toward a political ecology of sanitation, and present a summary of the points that my work in Sapecho generates for addition to political ecological theory as well as potential future focus areas. Later in the chapter, I discuss potential for wastewater reuse, another emerging area of interest that is ripe for theory-generation. In short, however, theory for



sanitation requires the marriage of three allied but often non-intersecting spheres of social focus: water, waste, and infrastructure.

### **Political Ecology for Sanitation**

Kelly Alley, in her work on wastewater in India, argues that political ecology “provides the strongest starting point for building an approach to the politics of waste disposal and treatment in India” (2002:26).. Indeed, this is the strongest starting point for the study of waste removal and treatment in Bolivia. Political ecological frameworks for addressing toxic waste removal have been widely relevant to my work. Barbara Rose Johnston speaks about water pollution from a political ecological perspective, and notes that industrial and municipal waste is severely polluting lakes in China, hazardous wastes pollute rivers in the U.S., and electronic waste and nuclear waste are disposed of improperly on a global scale, also impacting waterways (Johnston 2003). As she notes, the treatment facilities surrounding this type of waste are lacking and are impacting the environment. While not toxic waste or industrial runoff, human waste is causing similar harm to waterscapes all over the world, and in Bolivia these negative impacts are of chief concern, especially in water-scarce areas. The relationship between built infrastructure, human-created waste, and environmental harm remains relevant in the study of wastewater.

### **Encouraging Continuous Focus on Wastewater’s Water Component**

My study is focused on human waste that enters water, and the passages of that wastewater; I do not focus directly on human waste that does not enter water systems, although I would argue that it is just as worthy of anthropological study. As Gleick argues, waste treatment doesn’t take water at all; it is a cultural preference to treat waste in this fashion (2003). Nevertheless, centralized sewage removal systems, using water as a key element of this removal, and connected wastewater treatment facilities like the one in Sapecho are commonly implemented in both the developed and the developing world, especially in Latin

America and Asia (Verbyla et al. 2014). Thus addressing the enviro-social changes in terms of water and not just waste is important here. As I have argued throughout this work, WatSan infrastructure addresses a full water cycle, and provides human benefit while changing and trying to mitigate harm to surrounding waterscapes. I critique the fact that studies of water in political ecology often allude to but do not directly address the full necessary process of water and wastewater treatment when discussing wider ideas of water as a “flow resource” (e.g., Bakker 47) or a process. I encourage an appreciation of water issues in wastewater concerns -- and also vice versa.

### **Theorizing Sanitation as Infrastructure in Political Ecology**

Focus on networked infrastructures as a key component of sustainability and care for environmental systems, and the political ecological components of this relationship, has been undertheorized (Monstadt 2009). Infusing infrastructural studies with critical looks at enviro-social relationships and power structures is necessary. While studies on technology have widely addressed creation and proliferation of new technologies and the relationship of capitalism, neoliberalism, and gender to these technologies (both within and outside of anthropology), waste, sewage collection, and waste relationships within this sphere have been largely overlooked. As Alley notes, “attention given to waste politics has been rather meager,” and “critiques of development, capitalism and transnational commodity trades have ignored flows of solid waste and wastewater and have given only limited attention to waste treatment technology (2002:25). I agree with Monstadt’s argument that political ecology provides a framework from which to study “networked infrastructures from a broader perspective as socioecological systems” that both mediate and produce social and environmental returns (2009:1933). As Gandy also notes, historicity and attention to place are necessary in this realm, as the clear “relationship between the development of urban infrastructure and functional public realm is a fragile and historically specific phenomenon” (Gandy 2004:374). In working toward a

political ecology of sanitation infrastructure, I give specific focus to the appropriateness of certain technologies for certain areas and critique the gaps between social and infrastructural effectiveness.

### **Water and Culture for Sanitation**

The major questions raised in the literature on water and culture can be adapted to sanitation research. The questions (introduced in chapter 2) related to water and culture are just as central when the term “water” is replaced with “wastewater”: 1) how is wastewater culturally situated?, and 2) what are the meanings of wastewater beyond its place in use? The three components of water and culture literature that I outline in chapter 2 -- ubiquity, reflectiveness, and use -- still apply. Wastewater is still ubiquitous — it fits again with Mauss’s idea of a “total social fact,” a “social phenomena that cut[s] across virtually all domains of society” (Orlove and Caton 2010:402). Human waste is everywhere, and, apart from areas that practice solely open-air defecation away from water sources (rare) this waste usually enters a body of water, one way or another. Whether or not “wastewaterscape” or “wastewaterworld” will catch on is arguable, of course, but the waste that we put into water (wastewater is still water) is certainly continuous. If water generally is a barometer of certain common structural issues, then wastewater (and the management of it) is even more reflective of deep, structural, and glaring issues with “identity, power, and resources” (Strang 2004b:21). Alley refers to wastewater as “something more marginal to culture and ecology: the flows of wastewater that fill the interstices of everyday life,” and she goes on to note that “wastewater flows cause transformations in ecological and cultural systems and processes as they progress along diffuse paths” (2002:28). Wastewater, then, is both ubiquitous and “hidden.” The people who end up working directly with waste, regardless of location, tend to be of lower social status. The use and management of wastewater varies widely, but to treat wastewater and to ensure water safety, complex and communal management practices are often necessary. Why, then, is wastewater so easily writ

out of social study? Michael York argues that water reclamation is “another way” to address the sacredness and cyclic nature of water. But he describes this as wastewater “transformed into a resource as reclaimed water,” the assumption being that some human-built infrastructure undertakes the transformative process, whether it be wastewater reuse for surface water augmentation, river reclamation, or dams (2008:283).

Beautiful things have been written about the interconnectedness of and meaning of water, and Veronica Strang touts some of the loveliest. As she states—

*“The meanings themselves—water as the spirit, as life, as social, connective substance, as wealth and power, as generative source and regenerative sea, as nature, id, emotion and unconscious—all of these permeate the interactions that people have with water”(Strang 2004:245).*

This discussion focuses on the provision and meaning of fresh water, and it obscures and even forgets completely the processes by which water is expelled, treated, and returned to the watershed. These words cover over invisible processes of waste and reconstruction with words like “regenerative” – there are people and infrastructure in that process of regeneration, and that needs to be addressed. At times in the process of human use, water is full of filth, waste, toxicity, considered worse than trash. At those times it isn’t beautiful or a noble delight of nature, but it is just as important.

I amend here Strang’s statement about water to perceptions of wastewater as I’ve observed them. From my own perspective:

*The meanings themselves—water as waste, as collective filth, as socially hidden, as a dividing and marginalizing substance, as something to be treated, absolved, as a contaminating source and a difficult to harness byproduct, as unnatural, ego, negative emotion and conscious rejection—all of these permeate the interactions that people have with the water we call wastewater.*

Thus the relationship between wastewater and culture is a very different area of study than

water and culture. But should it be? It is in the way that we perceive water as waste in a part of its path through the world that makes it an “other.” We need to understand and work within these perceptions, addressing tensions with wastewater management, use, and relationships in context, certainly. But, we also need to amend these negative connotations and appreciate water, in all its forms and permutations.

### **Rural Sanitation Infrastructure in Alto Beni and Sapecho**

The city of Sapecho was rural at the time of infrastructure implementation and at the time of this research (under 2,000 people as per Bolivian government standards), but it was urbanizing. In Alto Beni, Boliva, ACDI/VOCA has implemented several different sanitation schemes, including sewer to septic tank, sewer to anaerobic bioreactor and maturation lagoons, sewer to facultative and maturation lagoons, flush latrine piped to septic absorption pits, and sewer to septic tank and biofilter (see Fuchs and Mihelcic 2011). These represent an array of choices from centralized, semi-centralized, and decentralized options. The system in Sapecho is one of the more centralized and full-scale sewage collection models in the area. The cost of the sewage system in Sapecho was \$319,959 USD, with a counterpart fee of \$131,373 levied on the population. Rural but urbanizing, consolidated communities are good candidates for implementing these centralized designs; however, both my study respondents and other scholars (Fuchs and Mihelcic 2011, Verbyla et al. 2014) have critiqued centralized systems' use due to complexity, cost, and management concerns. While these types of systems are technically effective (e.g. their efficacy is, at the outset, assured), their effectiveness in community settings is problematic. Development professionals did take this into account. ACDI/VOCA never gives centralized sanitation systems or wastewater treatment systems to communities with less than 100 families. As Sam states:

*If it is less than 100 families, we would never do a sewer system, because it's not at all efficient in any way. If they [the families] are concentrated then you*

*can really decide [if a centralized system makes sense], but for less than a hundred families we don't do it, and if it's less than 150 families, we encourage some type of latrines*

Even if centralized systems are implemented and the number of families sufficient to absorb the technology, Matthew Verbyla et al. note that smaller communities such as Sapecho often “tend to fall into what has been termed an infrastructure management gap—they are large and compact enough to have centralized utilities (such as sewage collection systems) but they are too small to have the resources within the community to manage highly mechanized infrastructure” (2014:Np). I will show that this partial infrastructure failure was at least partially due to mismanagement and operation missteps, but also due to wider issues with perception and practice at the community level.

I focus on individual use practices of sewage collection as well. In rural areas of Bolivia, the infrastructure commonly seen in the western world, bathrooms with toilets, has not always translated seamlessly. As recounted by Abraham Aruquipa, the country coordinator for Water for People Bolivia, “in rural Bolivia, a toilet is seen as a beautiful thing—a fancy luxury that is much too fine to be used for its intended purpose, instead toilets might be used to store potatoes or even live chickens” (2008:1). There are, as he puts it, “special challenges” for implementing sanitation services in Bolivia (Aruquipa 2008:1). These challenges, though, vary by location, even within the country. In Sapecho I encountered no such challenges with misuse of toilets for storage, but I did find that there were some perceptions and use practices that were difficult.

Further, as Fuchs and Mihelcic noted as well (2011:131), the sanitation system was not inclusive of all households in the Sapecho area. Fuchs and Mihelcic note that “some part of the technology or management design was inappropriate for the community (Fuchs and Mihelcic 2011:131). I will address the ways in which this inappropriate design impacted that part of the

community, and discuss issues of non-inclusion, marginalization, bifurcated use practices, and voluntarism that stem partially due to this partial coverage. From my survey, I found that residents of Sapecho proper are certainly not all connected to the sewage collection and wastewater treatment system; 74.8% are connected and 25.2% are not. This means that only about three quarters of the population actually has access to the sewage collection system. Those who are not connected to the system generally have improved or unimproved latrines (referred to as “*posos*”). Open air defecation is common in peoples’ agricultural lots and for some is also practiced at the household level. Even for those who are connected to the system, only 79.9% of Sapecho proper residents own a toilet (with 20.5% not owning one). This leaves a significant portion of the community without access to the sewage collection system, and many with substandard sanitation access. While I did not study health impacts directly, I will posit that there may be health differences between the “haves” and “have nots” and will acknowledge that people who did not have access did want to have access, although I did not see any clear indicators that people without access were marginalized.<sup>38</sup> I argue that implementing partial sewage collection for a portion of the community and not for others caused potential long-term inattention to these groups and disallowed their right to sanitation. Not only were they not served by the NGO, but the existence of the system in general will likely obscure their lack of access at the regional and state level for years to come.

I argue that appropriate technologies as gauged by engineers will be greatly influenced and informed by anthropological looks at the behavior, perception, management, operation, and attentions to sanitation infrastructure in community contexts, and my study in Sapecho serves as a first application of this approach.

## Using Sanitation

When I was completing my research in La Paz, one of the development professionals I interviewed told me about some of the surprises she faced in her time as a WatSan development worker related to human use of toilets and wastewater treatment infrastructure. She noted that in some areas, people were so unfamiliar with seated toilets that they crouched on top of them, with one foot on either side of the bowl, quite precariously, to defecate and urinate. In other areas, people used leaves as toilet paper, or used nothing at all. In some cases, the NGO had implemented complex wastewater treatment systems that failed because people were so used to open air defecation that the wastewater treatment system didn't receive enough sewage waste to support the anaerobic and aerobic microbial processes. When it came to sanitation, seemingly small behavioral things could and did affect the working nature of a system. Issues with sitting down while defecating, using toilet paper, and flushing properly were reported by several development professionals. As Federico, a development professional, stated: "before, what was most easy was to go to the mountain, rip off some leaves, or go to the river, and "I'm clean" and that's it. And now, when you say you have to buy toilet paper, [they say] "for what? when I can have [leaves] for free?"<sup>39</sup> Photos like Figure 26 were common in the area of Sapecho, and touted the benefits of using the bathroom. The sticker (placed on the outside of a toilet in Sapecho) reads: "Why use the bathroom? For health, for hygiene, to avoid sicknesses, and to care for the environment."

While these concerns were chiefly irrelevant in Sapecho, where people used toilet paper and defecated into their toilets, there were several behavioral concerns that could stymie the effectiveness of the system, could harm human health, and that caused issues for wastewater treatment operators.





Figure 26: Why use the bathroom?  
Sapecho, Bolivia 2012  
Photo By Maryann Cairns

During my participant observation in the town of Sapecho, as well as my interviews (I would often ask to see the in-home hookups after I completed an interview) I found that there was variation in the way that bathrooms and toilets were kept. These could be placed somewhere inside the home (more rare) and others were out by the road (more common). Those who did have toilets inside their home tended to be more wealthy or own newer houses. Problems with use practices were also reported. I observed several issues with use of the sewage collection system in Sapecho related to cleanliness, toilet paper, flushing, and toilet seats.

*Cleanliness:* Although Aguquipa (2013) found that in some rural areas of Bolivia people used their toilets for storage, that was not, as I saw, the case in Sapecho. No one I spoke to and none of the toilets I was able to observe were used in that way, and as toilet paper or newspaper, plungers, and wastebaskets were common, I would say there were obvious signs of

use. Toilets also were in varying states of cleanliness, with some pristine (no signs of feces or urine on the bowl), and others clearly not hygienically kept (clear signs of feces and urine, flies, and full wastepaper baskets). While I did not include toilet checks systematically (I felt it was very important that people be able to refuse this request), from my checks, and from my own experience, peoples' comfort levels with toilet cleanliness allowed for more buildup of feces and urine than in western contexts.

*Toilet paper:* Although development professionals in my study suggested that people do not buy toilet paper due to cost and lack of necessity/cultural comfort with the product in many areas of Bolivia, toilet paper was common enough in Sapecho. From my fieldnotes:

*"These are the toilet paper options at the little tienda I'm looking at:*

*1. A cloudy, grey-pink roll of paper, that looks like it was fashioned from the leftover gruel they serve at the cafeteria in Orwell's 1984, and which is nothing more than a slightly humid cheesy-textured film, costs about 1 B per roll. Just like juice-drink, this stuff only contains about 10% of what it advertises. If that. Maybe 5% paper.*

*2. National, a [overpoweringly] powder-scented roll of bargain-brand weight TP, costs 1.50 bs a roll.*

*3. A nice roll of Scott TP, cushioned and comfy, costs 2.50 Bs a roll.*

*n.b. Incidentally, our hotel charges 2 Bs for a cousin of the grey-pink roll, a dank grey-green roll, so humid the cardboard in the middle falls out, and so thin it turns to the consistency of mealy scrambled eggs when you use it. They're ripping us off."*

*So yes, I just went on for about a paragraph about toilet paper. But, when I talked to the development professionals, they often said that at first a lot of people here didn't buy toilet paper or didn't want to, because leaves are free. But pretty much every store sells*

*toilet paper now. And it isn't too expensive, right? But if people think 10 Bs for water is expensive for a month—would they double that with toilet paper? How on earth do I study that? Ask if you use toilet paper? Seems like a question everyone would say yes to. I know the doctor said he had to tell people not to use newspaper because the dyes in the paper are too harsh and can hurt you, though, but he said some people still use it.”*

From my observations, the development practitioners' worries about people using leaves to wipe did not ring true in Sapecho. People generally did use toilet paper when it was available, and people were familiar with how to use a seated toilet besides. I did, however, note that some people did not use toilet paper (instead using nothing at all) or used bits of newspaper, magazine, or other paper. This, as I noted in my fieldnotes, was something that the doctor recommended people not do. As I mused in my fieldnotes, this is a difficult study to complete, and I only addressed this cursorily. However, if systems are implemented that require toilet paper be used for hygiene (e.g., instead of bidets), then attention needs to be given to how this toilet paper becomes available and how it is used. Attention must also be given to how it is disposed of (i.e., flushed or placed in wastebaskets). Toilet paper is usually thrown in wastebaskets rather than flushed in Bolivia (wastecans are made available almost everywhere), but in Sapecho these wastecans were often overfull and attracted flies. Furthermore, people sometimes flushed toilet paper and other waste, causing issue for sewage collection and wastewater treatment plant maintenance.

*Flushing:* Unfortunately, some people did not follow or understand rules about what could and could not be flushed down the toilet into the sewer. Once the sanitation system was implemented, a wide variety of interesting things were flushed alongside human waste. The operator reported that people flushed doll heads, towels, toothpaste tubes, and various other household implements down the toilet, seeing this as a reasonable way to get rid of solid waste. This was a difficulty for the operator (as discussed in the operation section of this chapter), but it

was also evidence of a wider misunderstanding regarding the ways to use and flush toilets connected to a centralized system. Even four years after the implementation of the system, I took a photo at the wastewater treatment system, on top of the reactor next to the filter, that revealed an interesting amount of odd flushed bits, including toothpaste, pens, pencils, applesauce cups, bottle caps, and dental floss (Figure 27).



Figure 17: Odd Flushed Items into Sapecho Wastewater Collection System  
Sapecho, Bolivia 2012  
Photo by Maryann Cairns

*Toilet Seats:* Toilet seats were largely optional. While some households did have toilet seats, others did not. At the place where my research team stayed, my room had a toilet with a toilet seat, but the communal toilets did not have seats. While this is not necessarily a problem with the functioning of the system, it does point to a cultural difference in the ways that toilets are used and kept, and could be interesting to note for health-based studies of built sewage collection infrastructure.

These details may seem superfluous or “private” to some, but I argue it is important that researchers and practitioners of WatSan pay attention to these small issues. Ensuring that toilets and in-home connections to centralized sewage collection hookups are culturally appropriate, that they do not cause undue cost or cultural change to the user (using a bidet may be more appropriate in some cases, for instance), and making sure that the necessary accouterments to sanitation infrastructure are afforded to communities is key to success. Household-level cleanliness is also an issue that should be focused on; if in-home use of the toilet becomes more risky due to its cleanliness than open-air defecation, we might see a negative return on the investment of sanitation infrastructure. Furthermore, ensuring that people are trained in how to use the sewage collection system, down to the minutest detail (e.g. what to flush) is truly important to the long-term effectiveness of the sanitation system as a whole.

### **Perceiving Sanitation**

The study of sewage, wastewater and sewage collection (the infrastructure that carries wastewater) must include attention to human senses.

#### **Wastewater and Sewage Collection**

Sewage was a part of everyday life for all people in Sapecho, but when it came to managing wastewater and sewage collection infrastructure, the senses often got in the way. Just as human sensory experiences of water are “to some degree universal” (Strang 2004:49) so too are sensory experiences related to sewage and, if access to centralized systems exists, the infrastructure that carries it. Water, of course, is still part of the mix in this perception, but water, rather than being perceived as it is when it is “fresh,” is instead colored negatively by the waste it carries. While sensing and perceiving fresh water is usually characterized by appreciating the light that reflects off of it, the calming sound of its running, the sweet feeling off fresh water running over the body, or the delight of hydration (Strang 2004:49-60), wastewater

cannot and is not viewed through this light. Instead, wastewater carries with it negative and dangerous connotations. I describe the senses as seen in interaction with wastewater here:

*Touch:* Wastewater, unlike water, is not a delight to touch. It is considered dangerous to interact with, and just being within physical distance to wastewater causes people to become guarded and careful.

*Taste:* When you interact with wastewater, the taste of it gets in your mouth, and it is difficult not to cover your face with something. I often looked like a weird ninja when working at the plant, and a scarf or bandana was often used by people working on the system to cover the mouth.

*Smell:* Smell, perhaps more than any other sense, was a driving factor in peoples' dislike of wastewater. Admittedly, it smells terrible. I often thought to myself, when confronted with a tank full of it, "don't you dare puke in front of everyone." People often put a little bit of *Mentisan* (a mint-scented petroleum jelly) under their noses when interacting with it.

*Sight:* Wastewater looks like what it is, a mixture of feces, urine, and soiled water. It isn't pleasant, or light-reflective, or lovely.

*Hearing:* The sound of wastewater, unlike the lolling and gurgling of fresh water, sounds like plopping and churning.

Studies have focused on the senses for sewage treatment and wastewater, and most have honed in on smell as a key issue. Scholars have found that not only is sewage smell abatement a large problem for sewage system operators, but so too is it an issue for surrounding communities (Dzaman et al. 2009, Gostelow et al. 2001) Gostelow et al. actually argue that an increased knowledge of individual and environmental rights is encouraging individuals to complain about sewage and sewage treatment smells (2001:579).

The oppressive heat in the area was a compounding factor for all of these sensory issues, as was the preponderance of little bugs, ants, and flies that were very interested in colonizing a clump or two in the wastewater. Incidentally, "ormiga" is one of the words in

Spanish that is burned into my brain, to the point that coming up with the English translation is difficult. Biting, maleficent ants were a true danger while working at the wastewater treatment plant; if they stepped in the wrong place, people might have to disrobe and jump around, swatting at the swarm of ants crawling up their legs.

**A Note on Gendered Values.** Wakeman (1995) argues that women value sanitation more than men, and in my study this rang true. Women were often more likely than men to appreciate in-home sewage collection hookups and were more likely to talk about the ways in which access to hygienic in-home infrastructure was a benefit for themselves and their children.

### **Wastewater Treatment**

Wastewater treatment was barely a blip on the radar for a large part of the study population, and thus perceptions of it were partially nonexistent, or at least highly uninformed. When respondents from Sapecho proper were asked if they knew there was a wastewater treatment system that handles wastewater, 55.8% of respondents said that they did not (see Figure 28).

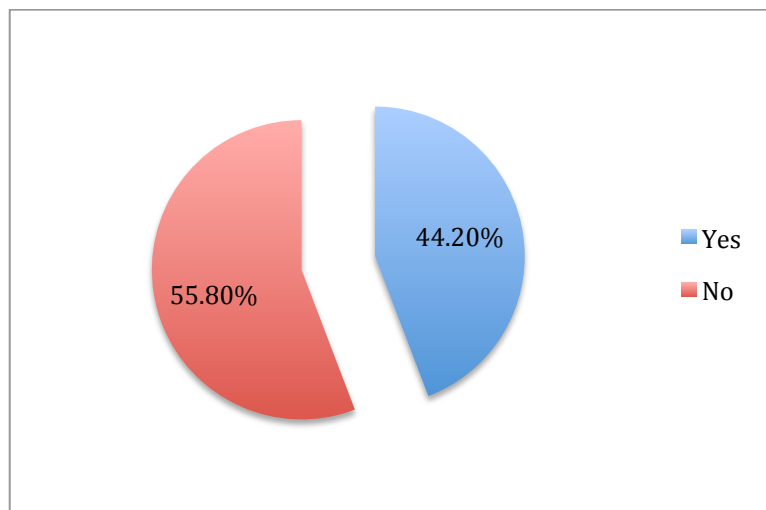


Figure 28: Do you know that there is a wastewater treatment system that handles wastewater?

Of those who did know that there was a wastewater treatment system, not all felt that it was useful; 8.0% of respondents felt that the system was not useful at all, and 14.0% felt that it was only a little bit useful. Still, 72.0% did feel that the system was useful or very useful (see Figure 29).

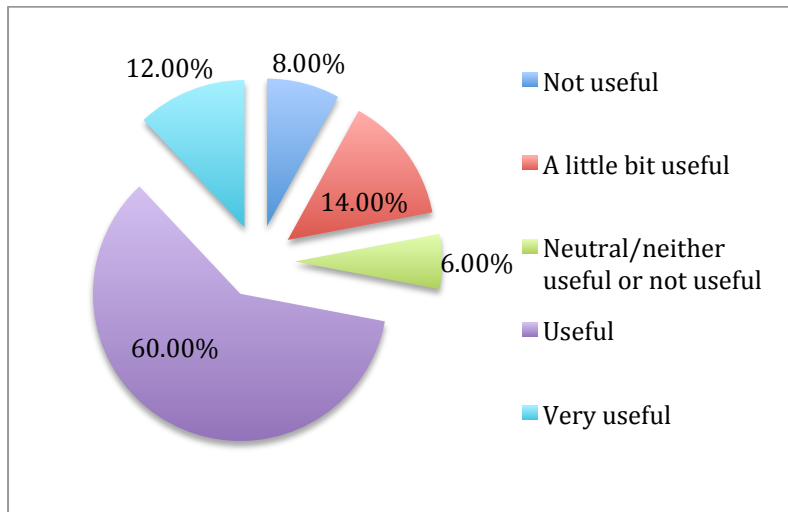


Figure 29: Do you feel the wastewater treatment system is useful to the community?

I asked the question another way as well, and received similar results. In response to the question “do you know what happens to your black water after you use it?” 36.6% of the people said yes, and 63.4% of the people said no (see Figure 30).

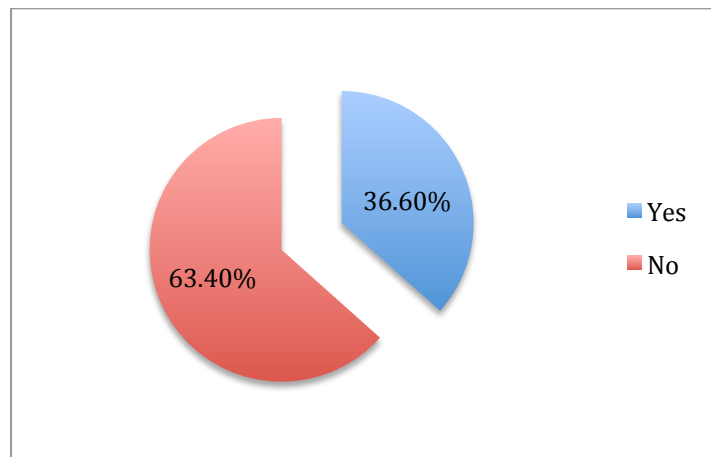


Figure 30: Do you know what happens to your black water after you use it?



However, for those who did know about the wastewater treatment system, there was a clear appreciation of its use and position within the community. The two main things that people appreciated were its ability to preserve and protect the environment and its infrastructural uniqueness in the area. Few other towns nearby had wastewater treatment facilities, and the look of the bioreactor was highly technical and impressive to many. I noted this in my fieldnotes after a day of work in Sapecho and a discussion with a man knowledgeable about the wastewater treatment system, which was representative of the perspective of most who knew about the system and its components:

*The wastewater treatment technology, for Jesus, was very effective, and he focused on the fact that the system was good for not contaminating the rivers. He knew that this was a key feature of the wastewater treatment system, and like everyone I've spoken to that is informed about the system, he talked very negatively about the other communities that are letting their sewage go straight into the river. He was trained in how to operate the water treatment system, but hasn't ever done it. He also talked about the filters that they use at the wastewater treatment plant, and said that the infrastructure is controlled and it works. He really likes the bioreactor, as I think a lot of people do. I think they like it because it looks more impressive and technical than the other parts of the system. His main point was that the treatment system was very important for the environment.*

Others who were less informed but still knew about the treatment plant's existence still liked the idea of the treatment plant. Some described the treatment system as big "posos," like big pit latrines. While they did not fully understand the working nature of the system or the fact that effluent was released into the river, they did understand the sewage was being treated in some way and appreciated its use.

The wastewater treatment plant was actually often associated with a sense of pride in the community's good luck in being the beneficiary of the complex system, and pride that their community was not contaminating the surrounding environment. As Alejandro states:

*The system that is down there...I've never known any other place with this type of sewage and wastewater treatment plant. Not even in Caranavi, which is a big province, a city. They don't have this, this wastewater treatment is new. And as I said before, they [Caranavi] were the first in Bolivia to have a sewer system. How good that we in Sapecho have benefitted [from the sewage system and wastewater treatment plant]. We didn't have a sewer before. Right now, for example, we see that every day in Palos Blancos they have problems with sewage.*<sup>40</sup>

Pride in the system was visible, too, from the careful and well-curated way in which the operator and his wife tended a garden of lovely flowers and plants around the system. Apart from the oppressive heat, overwhelming smell, and light-headedness one often felt from being near methane output, the appearance of the wastewater treatment plant was lovely.

That being said, participation in the maintenance of the system was practically nonexistent. For most, while they perceived the wastewater treatment system to be beneficial and even a source of pride, their perceptions and senses related to sewage and wastewater got in the way of their participation. People often explained that the plant stank, that it was hot, that there were bugs, and that they were worried about their health. Thus, even while peoples' perceptions of the wastewater treatment plant are positive, their negative experience with wastewater keeps them from engaging with the system. At the wastewater treatment plant, drawing on the work of Frenchen, Koe, and Vincent and Hobson, Gostelow et al. show that odors associated with wastewater actually increase, arising "principally from the biological degradation of the constituents of domestic sewage and are particularly associated with anaerobic microbial activity' (2001:80).

## Managing Sanitation

At all levels of my study, from the development professionals to some individual community members involved in its management, people managed and addressed sanitation infrastructure in a different way than water. This aligned with differences in perception between water (fresh water) and wastewater, as discussed in the previous section. However, it wasn't just individual emotional or sensory responses related to sanitation, but also the cost, practicalities, and complexities of sanitation that made it a more difficult management enterprise than water provision.

In response to a question asking whether or not the wastewater treatment systems were as sustainable as the systems for fresh water, one development professional in my study responded thus:

*No, this wastewater treatment is very expensive. It is expensive, it is uncomfortable, the odor of it. With water you don't have this, you don't have problems, it is really easy, water. It is clean, it is simple, and it is economical.* <sup>41</sup>

In response to whether or not the wastewater treatment infrastructure was worth the implementation work and costs, one development professional, Ronaldo, responded thus:

*This particularly, I do not think so. Because I have made these types of wastewater treatment with anaerobic filters, and I have made these systems, four of these I have made in different places [in Bolivia]. But the result isn't good. You've seen, the people they can't take out [the sludge], they can't do the cleaning. They need vacuum hoses for the sludge, but the vacuum hoses for the sludge are expensive. And for this [vacuum hose] you need electricity, you need gasoline, and that is expensive. And so you see they can't get the vacuum hoses. This type of system is not optimal. There are other types of wastewater treatment systems that are more common and easier to operate.*

*This type of system for example, for me it isn't very good for Sapecho because it is very expensive.* <sup>42</sup>

At the community level, the group as a whole took little to no responsibility for the sanitation system. Voluntarism was extremely low in the area, with only one member of the community participating as a volunteer at the system, and he was job-seeking. And, while some respondents from the survey said they would rather volunteer on sanitation than water, from my experience I find that difficult to believe.

As far as community-based knowledge of the system's management was concerned, not many people knew how it worked, let alone could actually manage it. Of the respondents, 59.3% didn't know at all how the wastewater treatment system worked, 25.9% knew a little bit, 7.4% knew a medium amount, and 7.4% knew a large amount (see Figure 31). That being said, it was really left to the system operator and his son to do the work of managing and keeping the sanitation system running, with occasional help from engaged members of the water committee and one other community member who wanted to get into the operation business (but was not paid).

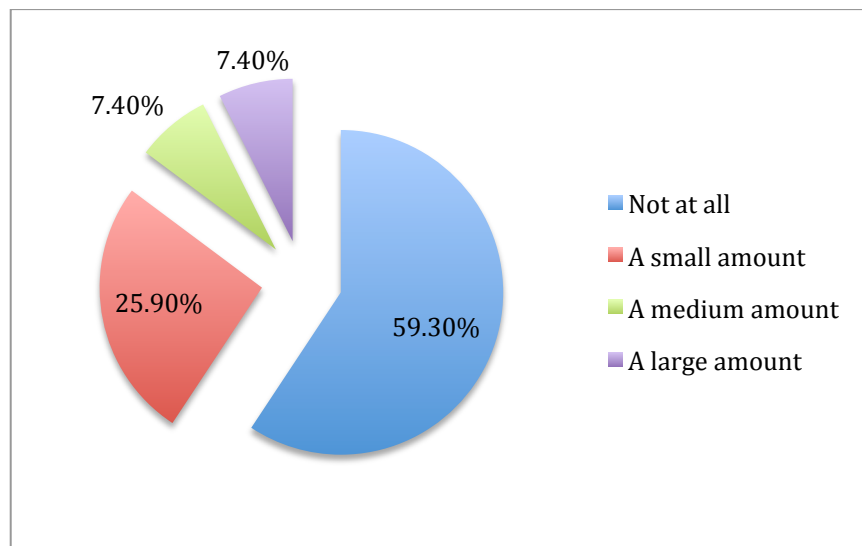


Figure 31: Do you know how the wastewater treatment system works?

As individual community members were often neither knowledgeable about nor interested in working with the sanitation system, the job fell to the operator; the consequences of this are described next.

### **Operating Sanitation**

This little excerpt from my interview with Sapecho's operator sums up his position:

*Maryann: So, do you feel like the committee or yourself is more responsible for the WatSan system's management?*

*Operator: Me, more than not, I think. If you don't have me, I think you don't have water.*

From my targeted study, I agree that no one is more integral to the viability WatSan system in Sapecho than the (one!) operator, who is practically falling under the weight of the WatSan system. His position reminds me of the "fallen caryatid" a sculpture by Augustin Rodin, the one where the caryatid is desperately trying to hold up the weight she's been assigned to, but is failing. In this entry, from my field notes, I describe the operator. This was written early on in my dissertation research, but I already knew the operator from the pilot. I think it was important here to personalize him and express the pace of his work:

*When I was walking back to the hotel I saw [the operator]. He's so small and worked and there is dirt under every fingernail. His hat has been washed and used so long it is a completely different color than the U.S. or china-made cap was in the first place.*

*Today he was clad in a striped soccer jersey, long-used and worn, and pants that were once black but are now more a grayish green. His skin is lined and dark and has ridges of dirt in it, but his eyes are bright and always glad to see you. He greets you with a handshake and garbled speech, his body seems like it was malnourished as it was*

*growing, and so his hands are stubby and broad to match his short frame. He smiles at you through a ruined mouth, two yellowing teeth on top on either side of a wide spanse of dark red gums. His lower teeth are missing save for a ridge on the right with a few yellow nubs. He always wants to know if we're going down to the treatment plant, or if any of our friends are, or if we want to come. He always has time for us but is also completely busy running from one side of the town to the other, tending to the breaks in the system and family problems and complaints and his own family and caring for the treatment system like a big, bellowing, high-maintenance child. From what a lot of people are saying, he's the only one that gives a shit about the system, the only one that comes, the only one that knows anything. And he and his son are the only ones that will touch the treatment plant, besides. No one has been volunteering.*

In another entry, I discussed the experience of being at the wastewater treatment plant and the day-to-day tasks of the operator:

*[The operator] comes 1-2 times a day just to clean the trash from the top of the reactor chamber. He climbs a rickety ladder, and then jumps down from one side of the reactor afterward. Over the years there have been fixes to the reactor so that it is easier to clean. The old filter didn't work, and it sits unused on top of the cement, waiting for someone to do something with it. [The operator] lifted it up while we were there, and underneath some big ant-like creatures were buzzing around, happy as bugs in shit, hanging out in a little colony of used toilet paper and chicken bones with a bit of feces around the edges. The new filter doesn't look as good, but it seems to serve.*

The operator and I spent a while talking one afternoon, luckily I finally caught him at a time when he could talk. The operator suggested a similar hectic schedule to the one I had deduced so early on:

*Maryann: How many people do you think should be hired to help you maintain the system?*

*Operator: To maintain it well they need 3 people. Like this we can maintain, it will be more clean, it's just that now I don't have enough time. Today, for example, there had been a break in the water pipe down here. I have other work and I don't know how I'm going to do it. I don't have time, I go over here for one thing, and another person will send me somewhere else, and I'll go there and be there and be ready. But then I'm the only one that is working, and the other [person] has left me there. At night I have to go to work to save everything.*

Apart from just the work as a whole, the operator singled out his work with the sewage and wastewater treatment systems as the real issue with his job:

*Maryann: Is there anyone else in town that knows how to manage the WatSan system? Or is it just you and your son?*

*Operator: Right now were just two working in the sewage system, others go but they never delve into these jobs, they don't want to, we go to work at this and they say they don't want to continue. Because of this...we started out as a group of 20 operators that were trained here, but nobody wanted to, I didn't want to in the beginning, I, too, didn't know that I wanted to...*

*Maryann: Why not?*

*Operator: It is because the sewer wasn't good, I had thought this, that if I go to work, I wouldn't know how to do it, and now that is how it is. It is difficult, it isn't easy to manage these things, to walk, to clean everything well, this is what it was, I thought that it was going to be more difficult than now, no, now it isn't so much anymore.*

*Maryann: Do you think they pay you enough for what you do?*

*Operator: Not so much, but sure if the wasn't so dirty...it's just that at the sewer I'll be there and because of this, because of being there every second I'm going to get sick.*

*This is why they call, and me I don't go to take care of it, because I need to make myself well. Because of this as well I wish they could pay me more, but if they don't want to pay me more, I'll just leave it there.<sup>43</sup>*

The operator rarely used protective equipment, and often went to the wastewater treatment plant in sandals and barehanded. From my fieldnotes:

*On top of the reactor there is a bunch of trash and gunk and bits of toilet paper and excrement. They started telling us about how sometimes it overflows because it gets blocked, and that is just disgusting. Last year they told us that [the Operator] always has his hands directly in the wastewater, digging stuff out, and now I'm both worried for his health and curious as to how his health is after the years of working with the plant.*

Certainly, the operator needed more support. Besides this, though, the operator had some specific (and seemingly very reasonable) requests for things that might help him get his job done. The first was help with transportation. He usually has to pay for his transportation himself (for a cab, for instance), or he has to walk hours at a time. Perhaps it is because I personally made the climb up to one of the water sources, but I would argue that he should be given a motorcycle. It is terrible to walk so far in the merciless heat, and it takes the whole day, just to get to the point where the hike begins up a dangerous mountain to get to the source. And to get back from that trek and go to the wastewater treatment is practically impossible. Providing a transportation budget or, better, a motorcycle for his use would both increase his effectiveness as an operator and spare him some personal wear and tear. Second, he needs



more people to work with him, especially with wastewater treatment, whether paid or volunteer. Third, he needed more protective equipment. While equipment was surely originally provided by the NGO, it did not last and was not replaced by the committee. Scholars have found that there was an increased risk of the smell and taste dysfunctions in workers with a long duration of employment in a sewage treatment plant and/or waste landfill” (Dzaman et al. 2009: 233); the need for equipment, even beyond gloves (which he also didn’t have) is necessary.

In essence, the operation of the sanitation and sewage collection system, far from being a community-managed, voluntary relationship with support and assistance, was instead individualized. The operator carried the burden for this component of the system almost wholly (except for help from his son, which had to be negotiated, and occasional help from the water committee.)<sup>128</sup> He also managed the wastewater treatment when he preferred to spend his time on fresh water issues. It was an immediate issue if there was a break in the water pipe or a problem with the fresh water system, but not so much with the wastewater treatment system. People often say things like “the NGO implemented the water system,” or “the community operates the sanitation system.” But, this is false. Using dehumanizing and de-individualizing language about sanitation implementation, management, and operation clouds the real issue – that individuals implement, manage, and operate these systems, and their experience and their benefits and risks must be attended. Whole municipalities, communities, states, or NGOs don’t really implement WatSan; a group of interested individuals does. The problem is that the combination of lack of assistance and lack of community-led focus on the sewage collection and wastewater treatment plants led to its partial failure. These individuals become the “invisible

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<sup>128</sup> While I did see water committee members helping the operator, it was during the project with USF and when the NGO representatives were around. The operator did not feel that this was a sustained and continuous relationship, and In my opinion often looked annoyed at being required to attend meetings where committee members spouted off for the NGOs.

technicians” (Shapin 1989) that prop up WatSan systems but get little-to-no credit for doing so<sup>129</sup>.

### **Wastewater Treatment Infrastructure Breakdown**

The inability to remove the sludge (solid waste) from the USAB reactor caused a breakdown in part of the wastewater treatment system. The issue came to a head when I was in the community, and there was quite a buzz on the day when the students from USF and UTB, and ACIDI/VOCA worked to address the problem.

*Three members of the water committee have actually showed up early to be sure that things are prepared for the day. The operator is here, but he was quickly called upon to fix the tap at the Jasapas building, and so now is fiddling with that rather than waiting at the table with the rest of us. ACDIVOCA is reportedly coming today, and they are anxious to talk about the problem with the reactor to them. They want to go see the reactor and take people to see the potable water, too. It is 9:00, and we're all just waiting for others to arrive, we chat a bit about the reactor and the problems and the program for the day. They place very official-looking maps on the table and on the bulletin board so that everyone can see. Big central table is covered with an army brown tablecloth, surrounded by a mess of mismatched wooden chairs. Bulletin boards with recommendations and meeting pictures, alongside posters from the various water aid programs that have come through here, are on the walls. Basic messages about sanitation are framed on a black piece of poster board.*

*The operator has on an old, torn jersey, worn out dress pants, and sandals. The jersey*

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<sup>129</sup> As if Shapin knew I was going to write this dissertation his influential 1989 work (that has driven science and technology studies' focus on infrastructure and its operators) has a comic at the end of the document that shows two janitorial staff cleaning a lab. One of the staff says “look at this article on sanitation and waste management. I'm listed as one of the co-authors.” Shapin's main point from this article is that the people that maintain and keep infrastructures (in his case, laboratories for scientific research) are both unseen and unsung in that process (Shapin 1989).

*has big tears in the sides. He's exhausted. The president has a polo shirt and jeans, looking very official with a big pair of black gum boots. The operator's son is hanging out track pants and a printed, brand-name tshirt. Waiting by the door for all to arrive. Another committee member is in a polo and dress pants, his glasses case and his cell phone holder are attached to his waistband, and the effect is official. The operator, again, looks exhausted, his head is in his hands while he waits. We start talking, and the pres. Brings up that maybe el ceibo and the university could help. The son picks at his nails.*

This waiting period was telling for me for several reasons. The first was that the arrival of ACDI/VOCA's representative spurred a great deal of pomp and circumstance for the committee. The second was that, even with that, only three of the committee members showed up to the meeting (showing, as I discussed in chapter 3, only partial engagement), the third was that the operator was so obviously the one who was working and would end up working on the system. He even was put to work during the time that everyone else was waiting. He was dressed to work, the others were dressed to impress. The last reason why this waiting period was so telling was that the excitement and hope of the committee for the help of the NGO was not realized. The NGO representative, while he really wanted to assist (and told me this when I returned to LaPaz) had no funding or ability to do so. This was largely due to political tensions and funding cuts from USAID, as discussed in chapter 2.

The partial failure of the wastewater treatment system is problematic on several levels. First, it was completely avoidable, and the NGO and USF's engineering program both ensured that the community had advance warning about what might go wrong with the system if operation and maintenance procedures were shirked. Second, while it was certainly the lack of upkeep that made it so that the system was irreparable, it was not because of a lack of work on the part of the operator (in fact, it would be hard to find someone who works more diligently).

Rather, it was due to the fact that the job of operating and repairing the wastewater treatment was second fiddle to ensuring potable fresh water and a working system, the fact that the requirements on the operator were simply too great, and the needs of the people too pervasive, to prioritize wastewater treatment concerns, added to the infrastructural issue that there was a problem with the sludge removal pipe that was not a fix funded by the water committee. Third, while the NGO came to see the problem, they were not able to address it. Fixing the issue would require a sand vacuum (as is used in mining) and renting one in Bolivia costs about \$2,500 U.S.D. This is prohibitively expensive, far out of the realm of possibility for the committee. But the NGO was leaving, and they couldn't really help either. The day was less about fixing the problem and more about getting the operator to agree to an exchange and training scheme with even more operators, which of course he has no time to do.

Later in our time in Sapecho, an engineer who was an advisor for the USF team tried to assist with clearing the sludge, and he employed several ideas to try to fix the problem. Unfortunately, none of them were successful.<sup>130</sup> At the time of my research, and to my current knowledge, the reactor was and is out of working order (see Figure 32 for a photo of our day working on this).

From my discussion with the operator's son, Marc, I was able to gain a bit of information about the reactor's problems, and what concerns they had about fixing it.

*Maryann: Is there anything that you think you will need external help with for the wastewater treatment system?*

*Marc: Yes, I think yes, because down below [at the treatment site], the truth is we are not going to be able to repair it, we're going to need help.*

*Maryann: And who would you go to?*

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<sup>130</sup> Again, as discussed in Chapter 3, it was not the plan or a requirement of the USF grant to provide maintenance for the system. This was done freely and in order to assist the system's constituents, to give back to the community that had so graciously collaborated with the students.

*Marc: Well, I guess we would consult people at ACDI/VOCA, the committee at JASAPAS would consult them.*

*Maryann: And if ACDI/VOCA wasn't there, would you speak to another person, another organization?*

*Marc: The truth is, I don't know.*



Figure 32: Attempting to fix the wastewater treatment system  
Sapecho, Bolivia 2012  
Photo by Nathan Reents

Algae clearing, another issue for the operation of the lagoons (the algae must be cleared for the digestion processes to work) was also not regularly conducted. While USF and the NGO provided specialized nets and equipment for this purpose, clearing is difficult and time consuming and has not been completed with regularity (although was markedly completed just before the team from USF arrived). This, too, will cause degradation to the system and only partial efficacy from the systems' components.

This one partial failure of the wastewater treatment system serves as a mini-example of

the ways in which the many levels of WatSan development and use affect the viability and long-term efficacy of a system. Here's a quick run-down of the steps that led to its breakdown.

1. Potentially inappropriate technology (USAB reactor) implemented. Not all in community are attached to the system. However, the USAB reactor is integral to ensuring that raw sewage doesn't enter the river.
2. Water committee in charge of wastewater treatment management gives it less focus than fresh water concerns.
3. Operator falls prey to "infrastructure management gap" and cannot keep the system up due to unclear understanding of training and general overwork. In addition, no one volunteers to help him, although the system is meant to be "community managed."
4. Operator does not release sludge adequately and so the system slowly lowers in its effectiveness and eventually must be cut off from the wastewater treatment lagoons to be fixed.
5. USAB reactor can't be fixed due to complexity and cost.
6. NGO, due to political constraints on funding and operation within Bolivia, cannot help fix the problem.
7. Even USF engineers, who are unrelated to the development process, but who happen to be in town, can't fix it, even though they volunteer their time.
8. The community has a broken USAB reactor, and wastewater continues to be rerouted.
9. The lagoons are thus not as effective as they should be, plus the USAB step is skipped. The system only is partially effective, and the improperly treated wastewater is now entering the river.
10. The system, meant to keep the wastewater from contaminating river and surrounding waterscape, due to its inefficacy, is harming the very waterscape it is meant to conserve.

From a political ecology perspective, several levels of influence as well as political and power-laden issues conflated in this example to cause negative enviro-social outcomes.

## **Conclusions**

I am aware that this chapter ends a bit bleakly for Sapecho. That is fair, I think, as the outlook for the Sapecho sanitation system is not promising. That being said, the study in Sapecho has offered quite a few areas for improvement, and if we look at problems as opportunities, we may address emergent social concerns within sanitation provision. Addressing sanitation from a political ecological perspective, which challenges marginalizing effects, power structures (especially related to voice and participation), and socio-environmental relationships, is not only useful, it is imperative.

Sanitation systems are meant to ensure a human right to sanitation, and wastewater treatment is an integral part of ensuring that this right does not create unsustainable harm to the environment. However, what are the implications if state-of-the-art systems such as the one placed in Sapecho are failing due to human-created issues? How do we address this, especially in disparate cultural and social contexts? Attention and appreciation of sanitation at all levels of the WatSan process is necessary. The problem of unequal perception and action within the water and sanitation components of WatSan development is widespread, however. As Maria, a development professional, states: “There is a lot of attention on what it is to have potable water, but there isn’t as much on the theme of wastewater treatment, after it is used.” Community members in Sapecho thought the sanitation system was great in theory, but rarely did this appreciation turn to actual involvement.

Certainly, failures in sanitation, sewage collection, and wastewater treatment can have dire consequences to human health. However, I would posit that before that risk is even seen, there must be lapses in management, operation, maintenance, and practice on the part of the public. Questions of responsibility for ensuring waste and wastewater are treated correctly are still open. Regulations at the government level, while drafted, are not widely followed in Bolivia. At the community level, it was like a game of olly-olly-oxen-free trying to get someone who wanted to manage the sewage collection and wastewater treatment system, and those who ended up taking on the job were marginalized as a result. While investment in training and education can assist in making a system feasible or sustainable, the system in Sapecho had neither of these in adequate supply. As Fuchs and Mihelcic argue, one “critical factor [in sewage collection sustainability] is the formation of a strong, representative, responsible water committee” (2011:132) As was shown in chapter 6, the committee was not representative, nor was it adequately trained in or focused on sewage collection (although a shift to this interest was recommended by its members). Sapecho certainly fell victim to the infrastructure management gap, but in unexpected, culturally-specific, and harmful ways that singled out

certain individuals and required they bear the brunt of the systems' burden. Neoliberal models that have pushed NGOs and non-state actors into being responsible for WatSan implementation and management have often missed the mark.

I never expected to get poetic about wastewater, but I feel that it is fair to do so now, if only to counterbalance all the cultural myths related to water in its more "pristine" form. In order for WatSan development to truly ensure rights and benefits to communities in the long-term, there must be an appreciation not only of sanitation infrastructure but also the cultural and material benefits of wastewater. Wastewater, for all its benefits, for its ability to remove and wash away the most toxic forms of human waste, and yet still, through infrastructure and human ingenuity, resurrect itself again as water, carrying along with it necessary nutrients for life-sustaining agriculture, should be appreciated. We shouldn't forget our water after we flush it, or worse, shun it. We should harness it.

On the infrastructural side, engineers are working to do just that, but on the human side, we're slow on the uptake. We forget the grandeur and the meaning of water once it gets mixed with waste; like yin and yang, these two sides of water balance one another. Our water stores hang in precarious balance, and water scarcity only continues to rise as the population of this earth grows. Wastewater is important, yet it is marginalized, obscured, forgotten, and defamed. People need to write about it and the people that end up managing it need to be supported and appreciated rather than similarly marginalized and obscured. Ecological sustainability hinges on adequate infrastructures for wastewater treatment. But so, too, does it hinge on thoughtful, innovative, and culturally-specific ways of handling infrastructure outside of current regimes that focus on centralized water-using tactics. Centralized system failures in a variety of rural-but-urbanizing locations have led to a focus on the ways in which urban and industrial solutions fall short in community contexts, especially when these systems are community-run. Major theoretical questions, too, arise from the marriage of WatSan infrastructure conservation (as discussed in chapter 5), WatSan infrastructure management and migration (as discussed in



chapter 6) and relationships to centralized sanitation infrastructure. Other questions include the extent to which wastewater reuse can decrease infrastructural costs; this has been shown to lessen life cycle costs of WatSan projects (Cornejo et al. 2014, Verbyla et al. 2014), but the question remains as to the social and management-based costs of this infrastructure. Verbyla et al. (2013) argue that rather than ensure pathogens are removed efficiently enough to enter waterscapes, small rural towns should treat water to levels which are acceptable for wastewater reuse. This is an interesting recommendation, and one that has social implications. From my study, acceptance of potential wastewater reuse was widespread, but the technologies and training to make it available were non-existent. Thus, a social component would be necessary to implement reuse. If reuse were to be implemented, I would argue that it would be best if the town would create a centralized place to irrigate their seedlings, which would cut down on fresh water use for this purpose. I discuss this further in the next section.

### **Wastewater Irrigation and Wastewater Reuse**

Wastewater reuse for irrigation or other purposes is a technical possibility for Sapecho, and would cut down on the life cycle cost of the project (Cornejo et al. 2013, Verbyla et al. 2013). While at this time Sapecho is not reusing these reclaimable resources, there is some possibility that reuse of these resources would be beneficial—with some caveats. First, the community would need to know how to harness these resources; second the existing systems would need to be working correctly; and third, new technology and infrastructure would need to be implemented in order to facilitate reuse.<sup>131</sup> I argue that at this time immediate focus should be put on ensuring the maintenance of the existing systems, and that wastewater reuse is inappropriate in the area due to social concerns (Verbyla et al. 2014 also argues that wastewater reuse would be inappropriate at this time due to concerns about the systems’

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<sup>131</sup> Currently the wastewater treatment system in Sapecho is not functioning at capacity and is not safe for human consumption or reuse for irrigation. While methane is produced by the USAB reactor it is unclear if the amount is currently sufficient to be beneficial as a reuse product.

pathogen removal failures). However, here I address the theoretical appropriateness of adding wastewater reuse infrastructure to systems like the one in Sapecho.

While wastewater reuse is common practice in some areas of Bolivia (such as Cochabamba, Cairns et al. Nd), there is no current wastewater reuse in Sapecho. In my study, a greater portion of the community was open to or unsure about reusing treated wastewater for their irrigation than were opposed to it. However, 46.4% of the community felt that they would use treated wastewater for irrigation, whereas 38.4% would not, and 8.0% did not know if they would use wastewater. This openness is encouraging, but the reality is that people don't generally irrigate their crops in Sapecho (81.2% do not irrigate, 10.1% do irrigate but generally not with water from the water system). Instead, Sapecho residents depend on natural rainfall for their crops. Furthermore, there is little to no perceived water scarcity, and this may lessen the impetus to reuse.

People did use fresh water (either from the system or river) for their gardens and their seedlings, so I would recommend focusing any attempts at wastewater reuse on a communal area to irrigate and grow seedlings (e.g. a community-wide nursery), or would lease the effluent to a nearby family who could use it for their garden or crops, paying a small fee to the water committee, sizably smaller than the cost of fresh water use for these purposes. Again, this would be contingent on a working and adequate wastewater treatment system, tested for safety in irrigation using common indicator such as E. Coli (less expensive but less effective), or, preferably rotavirus. The use of treated wastewater effluent in nurseries was studied in Italy near Pistoia, and while this is not a developing country context, and while the treatment procedures were different, the outcome of wastewater reuse for seedlings was very positive. The results indicated no "major limitations to the use of a tertiary effluent as an irrigation source in a plant nursery" (Lubello et al. 2004: 2946).

The community of Sapecho was split on whether or not they were agreeable to treated wastewater going into the rivers, with 43.3% saying yes and 44.8% saying no to effluent

entering the rivers at the time of the research (and the rest unsure of their position). Thus, not only are some people open to reusing treated wastewater for irrigation, some are also concerned about treated wastewater entering the rivers. Therefore, a solution that allowed for reuse without treated wastewater entering the rivers may be well received (Figure 33).

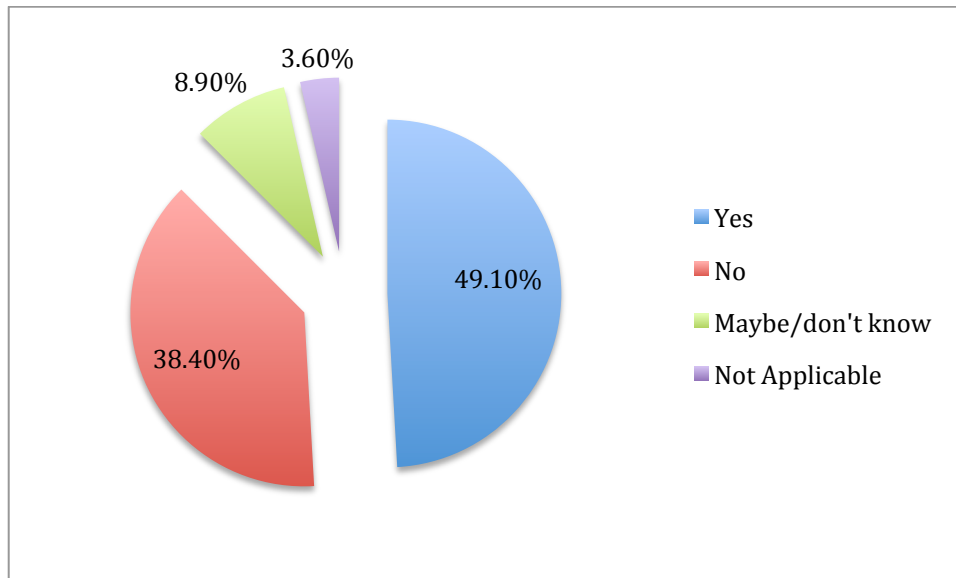


Figure 33: Would you use treated wastewater (black/grey) for your agriculture?

While wastewater reuse is a possibility on a technical level, and while it may be well-received by at least a portion of the population, there are behavioral and health issues to be considered. If the wastewater treatment continues to face operational difficulties, the use of wastewater effluent over time could actually lead to the contamination of seedlings or crops. While the nutrients found in wastewater can be very useful for irrigation (Ruthkowski et al. 2007), there is no promise at this time that these nutrients wouldn't come alongside contaminants without more rigorous wastewater treatment upkeep procedures in Sapecho (Verbyla et al. 2014).

Thus, while I would not at this time advise an addition of wastewater reuse infrastructure in Sapecho due to the wastewater treatment system's breakdown and the relative inability of the

now nonworking USAB reactor to treat for pathogens,<sup>132</sup> as well as social inability to manage current infrastructure as a whole, this does not rule out reuse as a component in other WatSan projects, especially where water scarcity exists or could exist and where irrigation practices are common. That being said, I would also caution implementers of wastewater reuse infrastructure to address some of the issues of marginalization raised in earlier chapters. Irrigation with treated wastewater in areas where wastewater treatment is partial or ineffective is very risky. Then again, so is partially or ineffectively treated wastewater entering the waterscape more broadly, especially when people downstream use that water for drinking. This analysis for Sapecho brings up several theoretical concerns surrounding wastewater reuse in community settings, which I will address here.

### **Perception and Training**

Perception of the acceptability, effectiveness, and safety of wastewater reuse is key to the adoption of reuse practices by communities. In areas where wastewater reuse is uncommon or has not yet been required (e.g. where water is not scarce and crops do not require irrigation) people may both be more likely to accept wastewater reuse practices and less likely to need to do so. Because they have not seen first-hand the health risks inherent in wastewater reuse with inadequately treated wastewater, they may be more likely to think it sounds like a good idea. At the same time, they might not need to reuse this resource, and if reuse infrastructure implementation or use was difficult or costly, even in the short-term, communities may reject its implementation. Appropriate low-cost methods of construction should certainly be considered (Schuval 1990).

In areas where wastewater reuse is common and necessary, on the other hand, (such as in Cochabamba; Cairns et al. Nd), people may already have a negative perception of

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<sup>132</sup> E.g., helminth eggs are more likely to stay viable in USAB treatment, even when working, than other treatment options implemented in the same area, such as the combination of facultative and maturation lagoons, and other pathogens will likely enter the waterscape if not treated effectively by the treatment scheme (personal experience, Verbyla et al. 2014).

wastewater reuse and thus be less likely to engage in these practices or support projects to implement reuse infrastructure. Still, these communities may also really need to do so, even to mitigate the effects of current ineffective reuse practices.

Training could very well address either case (or any set of cases in-between), but this would come at a cost to the NGO or implementer. If peoples' perceptions are negative at the start, changing those perceptions could take time and true effort. If perceptions are positive, ensuring people understand the risks associated with wastewater reuse, and the types of practices and procedures that are necessary for that reuse, would also be time consuming.

### **Language**

Language surrounding wastewater reuse may well be one of the most important aspects of training. While we certainly need to use words that make sense in developing country contexts, and while individuals need to understand the differences between sewage and waste that could be harmful to human health and wastewater which has been treated, trying out new "branding" for wastewater reuse could be beneficial. As I discussed earlier in this dissertation (see chapter 7), there is a tension between needing to address wastewater for what it is (water and waste), and appreciating it for what it can be (water, energy, and nutrients). Treated wastewater is still water, and it also contains nutrients which could be beneficial for crops and seedlings. Engineers often use the term "reclaimed resources," which to a point I like. Currently, wastewater reuse isn't perceived in the same way as recycling aluminum cans, returning plastic bottles, or creative upcycling of household items, but perhaps it should be. The problem is that even though the reuse of wastewater has monetary value (fertilizer, methane gas, etc.), few individuals use it as such.

While new branding may change perceptions, though, it is important that this branding does not obscure hard facts about wastewater reuse. It takes complex and expensive resources and infrastructure, and a working knowledge of health, safety, and systems

management to make the use of wastewater reuse products reasonably beneficial. I would caution that it is important not to obscure any risk associated with reuse of partially or inadequately treated wastewater with new labels that downplay these concerns, and that a change of perspective will take time and energy at the social, not just the infrastructural, levels. However, if wastewater is truly treated to the point that it is not harmful to human health, highlighting that with new words could be very useful.

### **Ownership**

Wastewater is a resource, and it has value. The ownership and worth of this resource, especially in areas where WatSan systems are implemented by external agencies, is as yet unclear in WatSan development projects. The projects are implemented by NGOs and run by a board of community members, but also are hinged on full community participation. Several questions arise from this line of thought. Who gets the benefit of wastewater profit? How is the cost of using this resource calculated? Who sets the payment expectations for the use of this resource? Should treated wastewater be conceptualized and billed more like water or like the nutrients it contains? If the cost of wastewater is hinged on supply and demand, how is demand for this resource calculated?

In some areas, where water is plentiful, use of wastewater could be seen as a good work or a public benefit, and not taxed at all – even rewarded. On the other hand, in areas that are water-poor, use of treated wastewater could be highly political and widely coveted. Not only is the appropriateness of treated wastewater reuse culturally specific, but so too is its value.

One fair answer to this issue would be that any wastewater reuse income would go back to the “community.” I would caution, though, that “community” as it is construed in WatSan projects isn’t a fixed social unit, but a network of social interactions that are continually remade” (Ratner and Rivera Gutierrez 2004:55). Many choices related to the use of those funds may not be widely acceptable for the community, and they will likely impart unequal benefit, as we have

seen. While a shared need or want of wastewater treatment may be appreciated by the community at large, when cost and payment are inserted into the equation the “community” could distrust or disengage with these practices if the benefits of wastewater reuse are inequitably distributed.

### **Benefit vs. Risk**

The benefits of wastewater reuse, both to individuals and to the environment, need to be weighed against technically-calculated risk (e.g. the acceptable risk in a perfectly working system) *and* expected risk in light of social concerns raised by scholars in the field of WatSan, including my own. Due to distinct disconnects between projected and actual effectiveness of WatSan systems in Sapecho, I would caution development professionals to think of risk as something both socially- and technologically-determined. This risk is not just based on infrastructure; it extends to behavior related to wastewater reuse. Will, for instance, individuals follow all safety procedures for reuse? Will reuse systems be checked consistently? Will individuals have access to money if fixes are necessary to the reuse system? Will individuals have access to technological help if systems’ upkeep issues are raised? If the answer to many of these questions is “no”, then wastewater reuse for human consumption, whether it be through irrigation or drinking water, must be thoughtfully examined. It is the responsibility of individual countries as well as the international community to ensure that policies are locally appropriate, and that risk to both health and the environment is reduced (Raschid-Sally and Jayakody 2014:vi).

### **Ensuring Cultural “Fit”**

Relationships with wastewater reuse will inevitably intersect with the other components of WatSan management and upkeep, but they will extend beyond those relationships into new categories of perception and use practices, and into new realms of social relationships. While wastewater reuse, certainly, is a good goal for development organizations, communities, and

environmental groups, the logistics of implementing such practices at the local level are complicated beyond even that of the WatSan system. Social factors and potential inequality and marginalization must be considered in wastewater reuse choices, as well as ecological and technical concerns.

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<sup>38</sup> Access, as discussed in Chapter 6, was more topographic and time-sensitive, not related to income, status, or other individual markers.

<sup>39</sup> “Antes” lo más fácil es ir al monte, agarrar unas hojas y listo, o ir al arroyo “me limpio” y listo. Y “ahora” tengo que comprar papel, “¿para qué?, si puedo hacerlo gratis”.

<sup>40</sup> las que abajo están...no conocí en ningún lugar ese tipo de alcantarillado. Ni en Caranavi que es una provincia así grande...una ciudad. No tienen esto, que es novedoso, y según comentaban, que eran los primero que en Bolivia, el sistema de alcantarillado. Que bien que nosotros estamos beneficiados. No teníamos alcantarilla. Ahorita por ejemplo, en Palos Blancos, todos los días están ahí con problemas de alcantarillado. Desde que conocemos, también hay agua. Bien pues, depende también de la calidad del agua, mucho tiene que ver con la salud de la población,

<sup>41</sup> “No, ese tratamiento de aguas negras, es muy caro. Es caro, es incómodo, los mismos olores, con el agua no tienes un, no hay problema es facilito el del agua. Es limpio, es fácil, es económico.”

<sup>42</sup> Particularmente no creo, porque yo he hecho esos tratamientos que se llama con filtro aeróbico, yo he hecho tratamiento, 4 de esos he hecho, en diferentes lugares. Pero el resultado no es bueno. Has visto, la gente no puede ni sacar, ni hacer la limpieza, se necesita bombas de lodos, y la bomba de lodo es caro, y para eso necesitas electricidad, necesitas gasolina y es caro, hasta has visto no pueden ni meter las mangueras, o sea ese tratamiento no el óptimo, hay otros tratamientos que son más comunes, más fáciles de operar... Ese filtro a mi por ejemplo no me parece muy adecuado para el medio, para Sapecho, no es muy bueno porque es muy caro.

<sup>43</sup> Q: ¿pero hay alguien que sepa cómo, o solamente es usted y su hijo?

A: Ahorita dos solamente estamos, trabajando en alcantarillado, otros van pero no hurgan esas cosas siempre, no quieren, ya vamos a trabajar eso les digo y no quieren ya. Por eso, para empezar, éramos 20 operadores, que nos han capacitado así, pero nadie no quería, ni yo quería al principio, como no sabía yo tampoco...

Q: Y porque no lo quería hacer antes?

A: Es que no estaba bien esa alcantarilla, yo mismo he pensado, como voy a trabajar, no sabía como hacer, ahora lo que se esta, difícil nomás es, no es fácil controlar esas cositas, caminar, hacer la limpieza bien, eso nomás era, yo pensé de que iba a ser más difícil ya, no, ya no era tanto ya.

Q: ¿piensas que te pagan suficiente por hacer lo que haces?

A: No tanto, pero claro como el agua no es tan sucio... sólo de aquí del alcantarillado sería, porque esa es, por ahí cualquier rato voy a enfermarme, eso que le llaman, ya no me va a alcanzar ya, para hacerme curar, por eso también podrían aumentarme, pero si no quieren aumentarme, lo voy a dejar ahí nomás ya.



## CHAPTER 8: TIMELY RELATIONSHIPS IN WATSAN DEVELOPMENT

### Processing WatSan

Here is a short narrative piece I wrote during my research process that interrogates WatSan development. It ended up being more telling than I expected, even though I was (admittedly) writing with a great degree of frustration and some hyperbole. I include it here in full, to put the gravity and scope of WatSan development into a first-person critical perspective (and personalize the frustration a little bit for others who are struggling with the process). It is followed by a targeted and perhaps more hopeful explanation of multiple factors that are at play in WatSan (the rest of this chapter, chapter 8), discussion and analysis (chapter 9), and policy recommendations and translations (chapter 10) which can, I hope, begin to address these tensions from a grounded, ethnographic, applied approach.

From my process:

*Government A wants their people to have WatSan systems, but ultimately they don't provide WatSan infrastructure (because of lack of money, political choices, or a variety of other reasons)—so NGOs and GOs hailing from the global north, often funded by Government B, provide a WatSan system to some “developing”, “needy” communities and not others. Government A isn't so happy about this mélange of external forces coming in and messing about in their country, but they don't have much choice in the matter—their people need water and sanitation in a bad way. Of course, Government B isn't just working in WatSan to be nice, instead they make choices about which countries and which communities to include in development based on their own set of standards*

*and priorities, with specific focus on their own aims, like stopping narco trafficking and making sure that Government A doesn't enact policies that are leftist in nature.*

*Then, some developing communities in Country A get WatSan systems, and their relationship with the NGOs and GOs that put them into place is either pretty positive or pretty negative. Regardless, these communities start consuming water resources in a different way than they did before the system. Conservation initiatives may be pushed to ensure that these communities keep the water system running and keep having water to come through the systems. Sewage and wastewater treatment aspects of these systems are meant to ensure that wastewater effluent is treated and doesn't hurt the watershed (in line with national and international standards), but those are particularly difficult to implement. In some cases a metering paradigm is recommended so that there is money to keep the complex WatSan system going long-term.*

*One of these complex WatSan systems (water, sewage collection, and wastewater treatment—the best possible infrastructure you can get) is implemented in one specific little town, let's call it Town C, and a metering system is implemented, too. The project finished—and it is working well. There is a committee, comprised of a group of elected officials—mostly men, with a few women shoehorned in to fit NGO's gender and female empowerment initiative. Bills come due, served by the committee of "peers," the water committee. These committee members get some benefits, like relationships with NGOs and potential job opportunities. But it is also difficult to be in charge of a water system, and at times their family, economic, and social lives are impacted in unexpected ways.*

*Some people in Town C can't pay for water now that there is a metering system, or there are pressures that keep them from paying (like their landlords, for instance), and so they end up not using the new system in the way it was intended—instead they go back to the river. They're already familiar with the river and it meets their needs for free.*

*Heck, it is even fun—you get to see your friends and can go swimming. So, these groups of people that can't pay for water for whatever reason end up with the same river-water borne skin infections and stomach ailments they had before the system was implemented. Besides that, anyone that can pay for water knows that these other families are obviously unable to pay because everyone sees them carrying their laundry to the river in a big wheelbarrow every Sunday. So now these families are socially stigmatized—in many ways they don't have access to the full benefits from the system that other groups within the community have. They feel kind of bad about it, but they are still pretty happy, because at least they have drinking water and even maybe a toilet at their house. That is an improvement.*

*And let's remember, the system does have an overall benefit for most people. Overall, in Town C, peoples' lives have changed for the better, they have more time to work, their health is better—or at least they think it is. So, these people on the margins are overlooked—even the statistics from monitoring and evaluation initiatives by NGO show that pretty much everyone is doing good and are happy with the system—success!*

*But of course, that doesn't mean that the poor kid at school isn't covered in skin parasites and taking a break from math class because he has diarrhea, even when there's a perfectly good water system that's bringing bring fresh, supposedly clean water to his house that his mom can't use because it is too expensive.*

*More broadly, the community is encouraged to care for the watershed—which is great, right? You need to keep that fresh water coming. They start buying up water sources and stopping people from cutting down trees—save the water, save the earth. “See, NGO? We're doing it right”, they say, “we're conserving just like you said.” This benefits the community that got the WatSan system, but it hurts whoever was supposed to be getting dinner off the money from the lumber, and it keeps some other community from having access to water sources, because now all the sources are fenced off and*

*pumping water down to Town C which has a brobdegnagian WatSan system that Government B and some NGOs helped with.*

*But wait, the actual day-to-day management of the WatSan system in Town C has been left to one operator, and he can't keep up. NGO has trained him to the very best of their ability, but he still doesn't feel comfortable adding chlorine to the water—the people don't like it and he's worried he's going to kill them with this chemical. So, the water isn't really potable. And this whole time, too, the wastewater treatment system is getting neglected in favor of the fresh water conservation and fresh water procurement, and no one is helping the operator fix the wastewater reactor, so the conservation piece of the wastewater treatment system (which is meant to benefit the watershed as a whole) has stopped working. Nutrients and pathogens from the system are entering the river. So the water, which rushes downstream to another community, is getting more and more contaminated, so people from that community are thinking it is looking better and better one town over, where the fresh water is delightful and seemingly ever-flowing. And wow, that town one town over even has flushing toilets. So, more and more people move to that little town, and the system gets even more stressed, and there is less and less water, and more and more human waste, and more and more environmental degradation. And if you can't go live in that little town, well, good luck—the water sources are being diverted there and they have juice factories and international partnerships and a unique place in the region because of that WatSan system.*

*So, even though the water system is good in that it meets basic needs for (most of) the people it was meant to serve, some people are left out all the way through, and the effects of the system are marginalizing inside and outside of that little town that got lucky enough to be chosen for a WatSan system. But again, the system is still seen, overall, by both the locals and the NGOs, as a pretty good thing (even by those who are marginalized!)—so what are you supposed to do about that? How do we make sure that*

*WatSan is a human right and that everyone has access to clean water and sanitation without messing things up along the way?*

*Well, that answer is easy! Give everyone WatSan infrastructure and make sure that is the kind that will work forever. Make sure that everyone in town can fix the system so that it doesn't get left to one old dude to do all the dirty work. And make sure that the management of that system is perfectly equal and fair. And, oh, make sure that the cost of all that water infrastructure is free because it is everyone's human right to have water and sanitation, so no one should have to pay for it. But also make sure that all communities have enough money to fix stuff when it breaks, because pipes aren't cheap. And make sure that there are engineers that will work for free to design the systems, too, because that is specialized knowledge, especially in Country A. Of course, that lack of education is probably related to the fact that Country B has been bilking Country A for all their labor and resources for years—so you might want to even that out a bit, too. Then, make sure that no one gets left out of the benefits of the WatSan system. Make sure that management is representative; that women are really included, which should be simple because all you have to do is change years of marginalization and gender bias. Then, make sure the water never dries up, and that everyone cares for the water well, and that no one profits from the water more than others. Finally, make sure that no one pollutes the water, and that everyone cares about caring for the water like the noble creature they're supposed to be.*

*But of course, don't forget that all countries, cultures, and people will probably be at least a little bit different, and you'll need to account for that, too.*

## **Introduction**

In WatSan, a variety of factors mediate the process of development. Through my research, I have shown that there are many levels of influence for WatSan (from the global to

the local and (hopefully) back again. I have also shown that the effectiveness of WatSan development is influenced by a wide array of political and social factors, the long-term effects of which sometimes go unseen in the short window of the development process. I have devised this section to connect these several levels in order to discuss intersections within my work. At times during my discussion in the previous chapters, so that I could adequately explain and highlight certain issues, the interconnectedness of these factors may have been obscured, and I hope that this chapter goes a bit toward encouraging the re-stitching of these relationships based on the issues that I have raised thus far.

Figure 34 shows the relationships between different levels of influence in the WatSan process. Communities and individuals absorb perceptions and practices from a variety of sources (as depicted by the arrows in the diagrams). Communities' and individuals' abilities to share their experiences and perspectives in the other direction, (shown by the perforated arrows in Figure 34) is more difficult. I believe this is where researchers with an eye for inclusion and participation in the WatSan process can contribute to praxis. Table 3 links levels and concepts surrounding WatSan that occur at various levels of the WatSan process, encouraging a crosshatch-view of levels and influences on infrastructure and society. I hope this will serve as a resource for others involved in the WatSan process, and as a guidepost for the following discussion.

The purpose of the diagram and the table is to directly represent social factors that relate to long-term effectiveness of WatSan infrastructures and to interrogate current development processes in light of lapses within social spheres. The next section addresses the intricacies of this process for Sapecho specifically, with focus on the relationship between residents and WatSan development and residents and development writ more broadly.

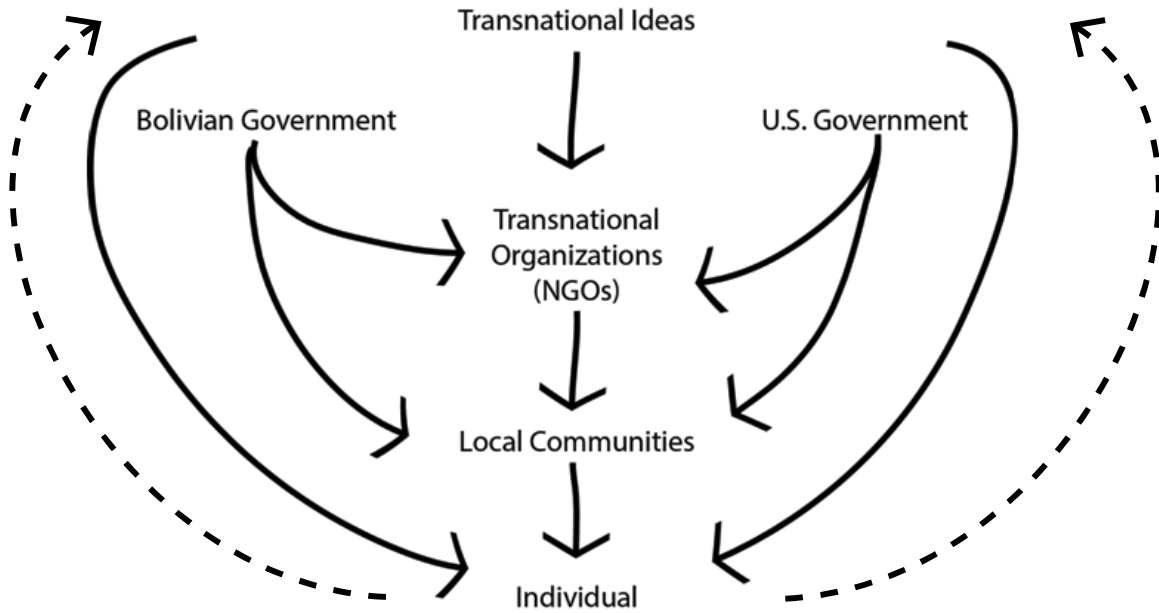


Figure 34: Levels of Influence in WatSan

### The Process of WatSan Development: Factors that Affect Long-term Effectiveness

The viability of WatSan systems in the long-term relies on a mélange of factors, many of which are social, rather than environmental or infrastructural, in nature. Expectations of long-term effectiveness of systems on the part of the community of Sapecho are illustrative, especially considering that a variety of factors will conflate in individual perception, and a variety of meaning goes into individual responses to the question of “do you think the water system will still be working in X years?” Community members’ perceptions of the long-term working nature of the WatSan system as a whole are quite telling. From my survey, 92% of respondents from Sapecho proper felt that the system would be working in two years, 79.6% felt that it would be working in five years, and only 56.6% felt that it would be working in ten years (see Figures 35, 36, and 37).

Table 3: Levels and Concepts in WatSan

Level	WatSan Use and Provision						
	Infrastructure	Management	Perceptions	Expectations	Influences	Action	Knowledge Sharing
<b>International (Transnational)</b>	Creation of definitions for WatSan Technologies:	Set expectations for Best Practices	Largely Western	Largely Western	Corporate Structure	Global goals (e.g., MDGs)	Human rights frameworks
	Appropriate Technology	Set regulations based on Western Models	High emphasis on best technologies	High emphasis on conservation	Global Governance	Creates Global standards	Press Releases
	Improved Infrastructure	Set goals for inclusion	High emphasis on IWRM and environmental protection	High emphasis on market-based approaches	Human Rights Ideas	Funding Opportunities	Best Practices
	Drives new ways to address global-level concerns with WatSan coverage				Powerful National Governments may be influential (e.g. U.S., E.U.)	Training Professionals	Influencing National-level Policy
<b>National</b>	Laws and Regulations on Infrastructure Standards	Sets structure of responsibility within country	Based on National Politics and Policies	Based on the use of those in power	International Relations	Legislation related to WatSan	National-level surveys (e.g. census)
	National Standards for Water Treatment and Water Effluent	Sets relationships between local and national governance	Usually the perception of those in power	May favor business or corporate-level use	Political parties/partisanship	Working with NGOs	Working with NGOs
	National Standards on Wastewater reuse	Provides models for WatSan management	Can be mediated by international perceptions or media attention	Can be mediated by international expectations	National Culture	Providing Funding for WatSan	National media coverage
			Based on national-level statistics	May favor urban vs. rural provision	Water and Sanitation situation in Country as a whole	Providing Country-level media and coverage for WatSan	Working with other governments
<b>Transnational (NGOs, GOs)</b>	New Technologies	Provides Water committee models, other community-level water management ideas	Largely Western, Developed World	Largely based on Western/Developed world use practices	Ethnic relationships within the country	Handling problems with toxicity, water scarcity	Grey literature
	NGO-specific guidelines		Based on current trends in WatSan	May favor certain communities based on policy or funder expectations	Neoliberalism	Works with community to implement WatSan systems	Trainings and relationships with communities
	Attempt to ensure appropriate technology	Works with management to ensure effectiveness	Based on International standards and practices	Conservation ideals are paramount	Academic Focus areas	Provides assistance and training	Funder reporting
	Chooses WatSan infrastructure for certain communities	Sets goals and standards for local management	Mediated by national-level requirements (both selected/not	Land use/water use tensions between selected/not	Funder requirements and expectations	Requires certain level of participation on behalf of community	Monitoring and Evaluation
<b>Transnational</b>	Provides training for upkeep and operation				Politics and policies (internal and external)	Reports to National Governments	



Table 3: Levels and Concepts in WatSan

Level (NGOs, GOs), Cont.	WatSan Use and Provision						
	Infrastructure	Management	Perceptions	Expectations	Influences	Action	Knowledge Sharing
<b>Local/Community</b>	Requested technologies	Sets standards for community management	Based on local culture/indigenous perceptions	selected areas may not be fully problematized	Individual development professionals		Inter-agency relationships
	Local practices			May be set by powerful groups within the community	Neoliberal Logics Global rights ideas	Seeks funding, WatSan coverage	Shares local knowledge
	Traditional water use	Accepts/rejects NGO requirements	Religion may play a part in WatSan values	Based on local environment	National policies, programs, and identity	Works directly with the aid agency	Shares local management structure
	Traditional Defecation Practices	Provides organic "fixes"	Mediated by environment (e.g. water scarce vs. water rich)	Based on traditional, shared use ideas	Transnational organizations and sharing of ideas	Works directly on the construction of the system	Shares history
	Traditional land rights/water rights may come into play	May marginalize certain groups based on local lifeways	Mediated by "comparative" position (e.g. vs. other communities)	Also mediated by national, transnational, global forces	Neighbors Environment Culture, Ethnicity, Gender Roles	May work directly with local government, national government	Shares environmental knowledge Trains own community members Shares information with community
<b>Individual</b>	Household-level infrastructure (rain catchment, wells, etc.)	Sets own level of participation	May be mediated by any other level	Individual behaviors	Culture	Participates in WatSan construction	Shares personal knowledge
	Individual built infrastructure	Sets own level of support for management	Based on individual experience and comfort levels	Familial, inter-familial relationships	Ethnicity	Gives own money for construction	Shares knowledge with neighbors, migrants
	Individual behaviors	May pay for water management and water access	May be influenced by individual status, e.g. gender, ethnicity, age, socioeconomic status	Individual health	Individual Status	Constructs household-level infrastructure	Works with NGO professionals
	Individual standards of cleanliness/water treatment	Provides feedback for WatSan management		Family Size Perceptions Labor	Economic Level Individual Health Education Level	Participates in volunteer requirements	May gain training or specialized knowledge in operation
	Reciprocity, water sharing				Position within Community Age Other demographics	Makes choices related to own WatSan use	Shares individual experience

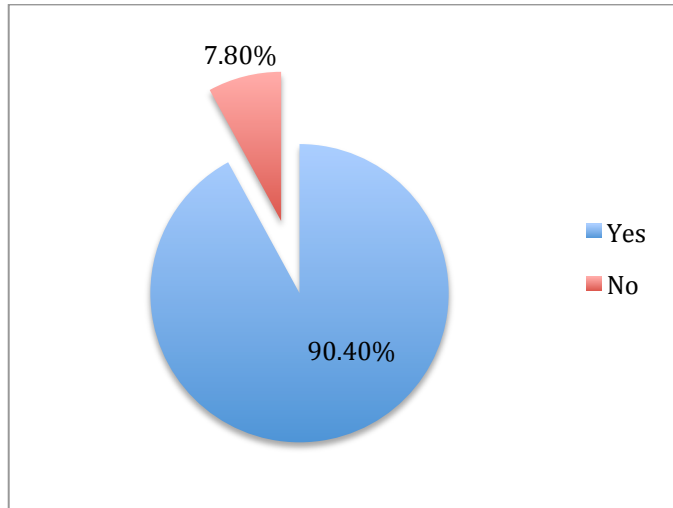


Figure 35: Do you think the water system will still be working in two years?

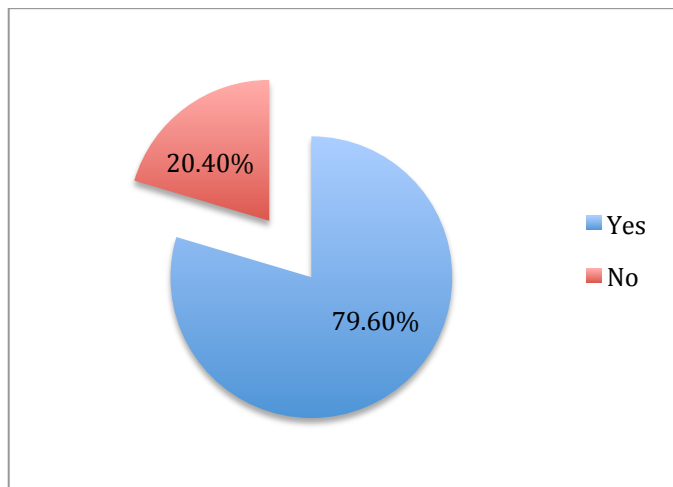


Figure 36: Do you think the water system will still be working in five years?

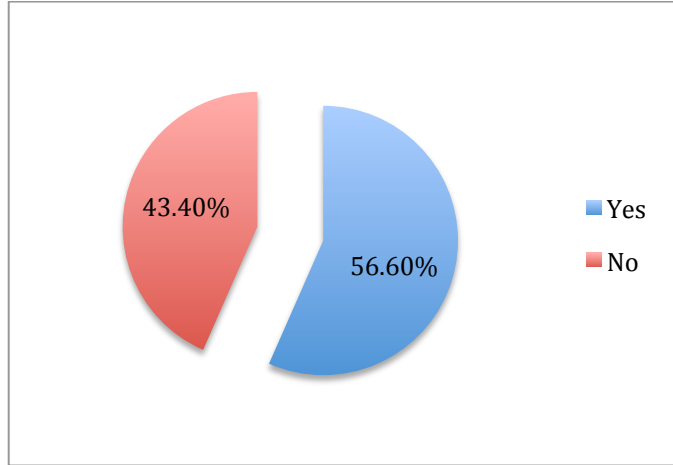


Figure 17: Do you think the water system will still be working in ten years?

These somewhat bleak numbers become even more so when we apply them to sewage collection and wastewater treatment infrastructure viability. Only 55.6% of respondents felt that the sanitation system would last as long as the water system (see Figure 38) Many community members felt that the system was going to tank, and long before the expected 20-year mark.

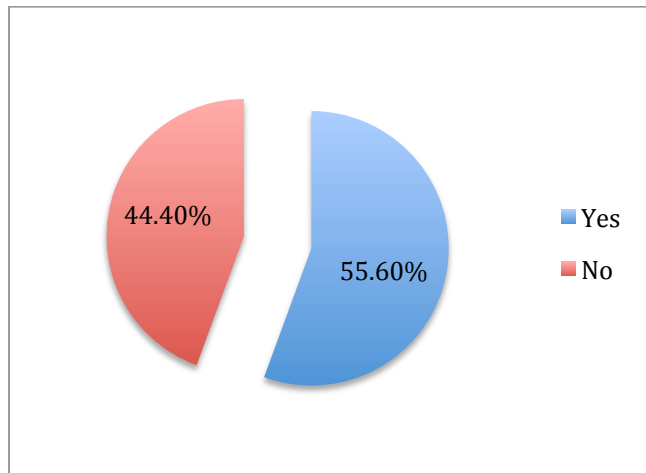


Figure 38: Do you think the sanitation system will last as long as the water system?

We should also remember that the water and sanitation systems in Sapecho were both already failing—neither was fully working as of 2012, only 4 years after the system was fully finished.<sup>133</sup>

Community members are both participants in and passive bystanders to the breakdown of water and sanitation infrastructure. Many felt that the WatSan system was endangered, but few actually volunteered their time to assist with its upkeep. Part of this was due to lack of ability and training, part due to confusion about responsibility, another part due to distaste for government inattention to the area, another due to inequality in WatSan management, and some to do with sensory distaste for the work itself. In what ways do the many levels of WatSan influence individuals' perceptions of long-term efficacy of the system? How do we link these concerns and address them such that people both participate in WatSan work and believe in its longevity? These are the broad questions that this dissertation addresses. The following sections add to this focus by presenting allied issues and problems in connecting rights and development foci that specifically address relationships between development, nation, region, and community. Tensions between national and transnational responsibilities are raised, and issues of community cohesion and identity follow.

### **Positionality and Wider Perspectives**

Water resources in Sapecho have been mediated by a variety of NGOs, organizations, and individuals. My work focused on a snapshot of the WatSan life of the community, and while it was certainly an integral and formative part of that process (especially as it afforded sewage collection and wastewater treatment), it is neither a start- nor an end-point. Part of why I don't use the ethnographic present is to encourage attention to the short-term nature of this particular WatSan process. Relationships between the vast majority of WatSan beneficiaries in Sapecho and the development agencies who were a part of that process were good, but perspectives on

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<sup>133</sup> I hope to follow up on the systems' improvement, deterioration, or stasis in future research.

development and future outlooks for development assistance are telling. So, too, are residents' perspectives on WatSan and development responsibility.

### **Relationships with ACDI/VOCA and USAID**

Relationships with ACDI/VOCA and USAID on the part of Sapecho residents were overall very positive, and the relationship with the organizations was clearly considered, by a large part of the population, to be the only way water needs would have been met; 64% of respondents felt that their water needs would not have been met without the agencies, whereas 36% felt that they may have been met in another fashion. Both in Sapecho proper and in the adjacent communities there was a theme of overall benefit, reported good relationships, and encouraging anecdotal evidence of reasonable, reciprocal relationships between the agencies and those who were directly involved with the organizations. However, these relationships were not only perceived as good based on experience with the WatSan system implementation, they were perceived as beneficial because they were better than what the government could give, they were aligned with other types of development projects also implemented by USAID, and they imparted better infrastructure than areas nearby. From my fieldnotes:

*The man we spoke to today had a wrinkled, sunburned face, and as we spoke sweat seeped into the lines around his eyes and mouth. We met him in the heat of the morning, when it was too hot to walk without being drenched in sweat and too sunny to look too far in front of you without shielding your eyes. His pants were tattered and re-patched, torn at the bottom like a pirate in the movies, but you could tell these rips were from real wear and not a costumer's attempt at historicity. He said some things that were interesting. He really liked USAID, said they help quite a bit in the area—"they worked with us," he said. USAID gave them water, health, and education facilities. This was followed by him relating this involvement to that of the government of Bolivia—the*

*national government doesn't help them and neither does the municipal government.*

*He said he knew that they needed money for the water systems' upkeep, and he was fine with that. He said that the installation was more difficult to pay for than the monthly pay, and for many the installation was a true hardship—worth the pain, though, he said. He noted that the immigrants all need hookups to the water system and they all get connected eventually. But at times people can share with the immigrant families around them. He said that water use for agriculture is prohibited, that they can only use it for their families, and thought that was reasonable. The water treatment facility, for him, was very good because it kept the waste from the system from contaminating the rivers. He talked down about other communities that didn't have this facility and was distressed that these areas were letting their sewage go straight to the river.*

The discussion that I had with this community member was representative of the conversations that I had with individuals who were both knowledgeable about the WatSan system and had worked with USAID. However, not all of the community was directly involved with the agency, and even those who were didn't necessarily fully understand the process of selecting Sapecho, the WatSan system, or the management process for the project. Only 33.8% felt that they knew why Sapecho was chosen to receive aid to build a water system through these agencies; the remaining 66.2% of respondents hadn't a clue. However, USAID and ACIDI/VOCA were certainly not the only agencies working with the area, as I addressed in chapter 2. Thus, perspectives on development in general also colored this relationship and expectations of participation and involvement in the area.

### **Wider Development Consciousness**

ACDI/VOCA and USAID were only some of the many aid organizations working in the area, and WatSan was only one sector within which the agencies were working. Survey

respondents' answers to the question, "do you feel that development agencies help your community?" ran the gamut from "not at all" to "completely" (see figure 39). A little less than half the respondents reported seeing economic benefits to their family because of development agency projects, and 50.8% did not see any benefits to income.

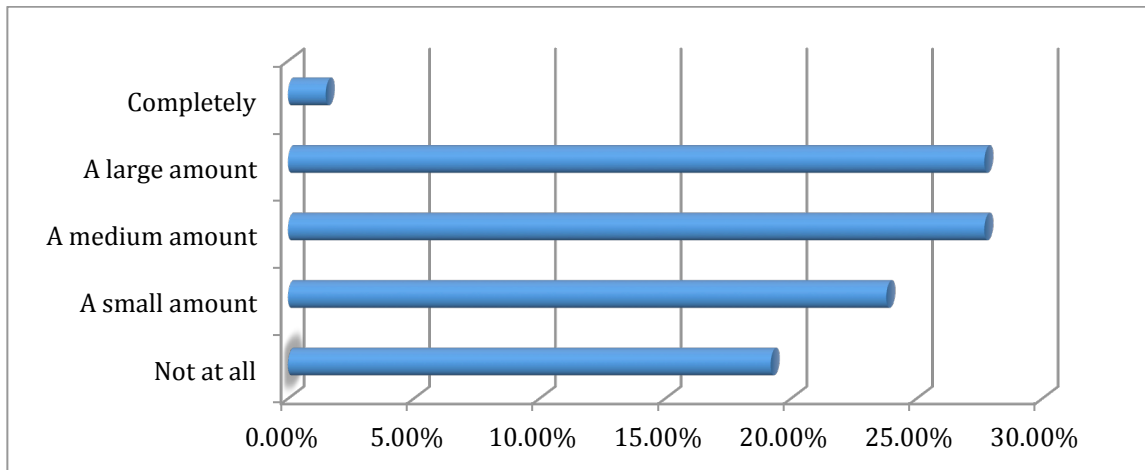


Figure 39: Do you feel that development agencies help your community?

Sapecho residents were asked if their life would change if the development organization left their area; 34.3% said no change, 19.6% said their lives would change for the better, and 45.7% said their lives would change for the worse. This suggests a variety of relationships with development aid and organization. When looked at spatially, I could see the density of these responses. In order to protect anonymity, I am only including heat maps (not individual point maps) in this final product (although it is likely impossible that an individual household could be pinpointed by the GPS point as it is represented in a zoomed out map, since the town is small enough). In the point map that I analyzed, however, a red dot represented a household whose responding member felt their lives would be worse if the development agency left, a green dot a household whose member felt their lives would be better if the development agency left, and a yellow dot one whose member felt their lives would not change one way or another. I found that the green dots were concentrated in the commercial area (older) and the newer (new migrant)

areas of town. While the map is certainly more of a heuristic tool than an explanatory one, it was interesting to look at the responses vis-à-vis my ethnographic experience in an exploratory and preliminary way. New migrants, as I have discussed, had less of a relationship with the NGOs, and the commercial area was home to the residents who had lived in Sapecho longest, and perhaps benefitted less from housing (such as Habitat for Humanity), poultry and coffee programs, and other focus areas. These may be ripe areas of investigation for future projects.

### **More Development?**

These tensions aside, 90.1% of Sapecho residents did see a need for more development projects, and suggested projects in a variety of sectors, from basic needs to industrial infrastructure. The responsibility for these projects, however, while currently being filled by an amenable enough relationship with transnational entities, was something that the respondents for the survey felt *should* be placed closer to home, in response to the question “who do you think should be most responsible for development initiatives in your community?” only 3.8% said NGOs, and only 1.5% said other countries’ governments. Instead, the bulk of onus from the view of the respondents lay with the community itself (54.2%), followed by local authorities at 18.3%, with some other options also chosen (see Figure 40).

Thus, even in areas where transnational development relationships with U.S.-based GOs and NGOs was characterized as positive, that doesn’t mean that the community has become reliant on or even fully comfortable with development agencies as that provider. Certainly, residents realized that they were currently unable to achieve this development on their own, that the state did not support them, and that the development agencies were addressing these needs in a reasonable enough way; however, community members felt that this was a stop-gap and a temporary, need-based relationship, filling in where structural and political mechanisms had failed.



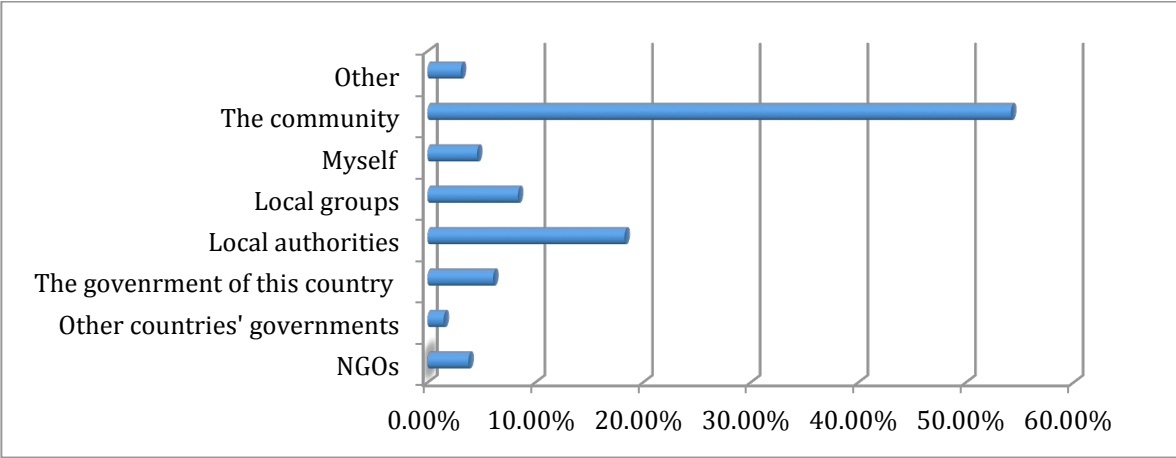


Figure 40: Who do you think should be most responsible for development initiatives in your community?

This is important to note for three main reasons: first, the people of Sapecho, like so many who receive WatSan aid, were aware of their position and their place within their nation, and weren't passive about or uneducated on the structures that lead to underdevelopment. Second, they had a healthy skepticism but a true hope that the community and local government would be empowered enough to address their own needs without the involvement of external agencies. Characterizing Sapecho residents as without agency, ingenuity, and self-determination would be categorically wrong. Third, these residents organically felt the tension between the changeover in WatSan provision between national and transnational forces. Rather than fully embracing the transnational (regardless of good working relationships), they continued to feel a sense of sovereignty and national-responsibility, although due to weak state and inattention to their community, they had begun to assert this sovereignty at the community rather than the national level. While in my work I address issues and limitations related to WatSan upkeep, management, and provision (such as funding, training, etc.) these limitations should not be construed as inability or lack of initiative, but rather a temporary chink in the chain within which the Sapecho community works for its own betterment. An interrogation of the relationship between development, rights, and community agency is needed.

## **Rights and Transnationality**

As early as 1997, researchers found that NGOs were “increasingly accepting the burden of poverty alleviation from retrenching and decentralizing state agencies” and these donors and aid groups hailed from several different sectors and nations (Gill 1997:146). Personally, I am acquainted with and have visibly seen the work of USAID, ACDI/VOCA, and Water for People<sup>134</sup> related to WatSan in Bolivia. Agencies such as We are Water, Inter-American Development Bank, UNICEF, and the WorldBank focus on WatSan in the country as well.<sup>135</sup> Within Sapecho, many different organizations have worked to ensure that locals have access to healthcare, roads, animal husbandry techniques, and agricultural methods, among other components (e.g. Habitat for Humanity, UNICEF). The confounding factor of having several different aid agencies working in the country as a whole, and in Sapecho specifically, aids and yet at times obscures study related to these GO/NGO relationships. In the case of the U.S. and U.S.-funded organizations, the politics of the U.S. color GO/NGO moves and local perceptions. Multiple external relationships (whether U.S. or not) can influence general perceptions of aid benefit. NGOs work in a complex and interrelated aid environment, as do the communities that collaborate with them. However, perceptions of true responsibility for ensuring the right to WatSan were muddled, and were still steeped, for both development professionals and local communities, in nationalist vs. transnational ideologies.

### **Nationalism and the Right to WatSan in Bolivian Politics**

NGO professionals, when asked, were able to directly address their personal perceptions of the theory of WatSan as a human right and point to the on-the-ground issues that make WatSan as a human right difficult. This was a specific aim of my project, to address this disconnect, and it was something that resonated with already existent concerns of development

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<sup>134</sup> This was in Cochabamba, Bolivia on a separate research trip (not included in study sample).

<sup>135</sup> This list is not meant to be exhaustive, but rather to give several well-known examples.

professionals. DPs pointed to problems with responsibility (e.g. who is responsible for ensuring the right to WatSan), infrastructure, systems upkeep, and payment.

When it came to responsibility for WatSan rights, DPs responded with conflicting responses. All were working for US-based institutions implementing WatSan projects, and so saw some responsibility placed on the international community and on those who had access to funding and knowledge related to implementation. However, they also saw some issue with this, as the idea of nationalism was still widely accepted as paramount. In reality, most claimed it was the government's responsibility to ensure WatSan for their citizens. As Ronaldo states:

*“Well, who should provide [WatSan] is the government, but the government is more concerned with politics, actually I'm talking to you about Evo, his management does nothing, everything is political, coca, persecuting the opposition, and so they aren't dedicated to the task [of WatSan], and so who is it that is doing WatSan? They say the townships should do it, but the townships don't have much money. And so they can't do it, and so who is? NGOs, in this case, us. We have different NGOs [in Bolivia] and so they do it.”*

This lack of responsibility for implementing WatSan projects on the part of the government was even more difficult a pill to swallow for many workers because of the big political importance that the Morales administration placed on the rights of mother earth and the right to water and sanitation. The responses also presented that WatSan as-a-human-right was conceptualized differently by the Bolivian government and NGOs, and that the Bolivian government allowed for conflicting policies and practices related to the right to WatSan.

## **Identity Reconfigured**

Identity, and specifically changing identities and shifting ideas of home, indigeneity, and community, are an element of interest. As exemplified in my work, Sapecho residents were considered by the government as well as themselves to be “intercultural” rather than indigenous (see chapter 4). Still, traditional forms of management and practice surrounding water seeped into use and management (e.g. the success of community-based governance and perspectives on water and waste use/Mother Nature). This, of course, isn’t to say that the levels of influence as discussed earlier in this section have not had a clear impact on local society, their decisions, or their positions on WatSan issues.

Rights knowledge on the part of the community was mutually constructed. When people did know about human rights in the UN sense of the word, it was connected to the relationship with various development agencies. Layered in this understanding was the position of the Bolivian state, and the Bolivian state vs. the larger global community on rights issues, as well as the government’s perceived inability to either ensure or address those rights in local contexts. Identity and values, then, both within and outside of WatSan were being influenced by the wider process of development and were being constructed partly in response to weak state policies. Beyond this, too, people were experiencing differences in the way they construe “community” and “home”. Their community was beginning to form a clear part of their identity, and even started to replace nationalism or indigeneity. They saw their community as not only cohesive, but also able to take on responsibility for development needs.

Using a specific process of development, in my case WatSan, as a lens to view wider development approaches, is a good way to construct a rights-based approach to development that is sectorally and individually relevant in changing relationships with state and non-state actors. Negotiating changing identities will continue to be especially relevant in WatSan, a sector within which many aspects of society, identity, and values are related. Attention to

WatSan issues in surrounding areas must also be included. As an example, I present the relationship between Sapecho and Palos Blancos.

### **An Additional Factor: Sapecho vs. Palos Blancos**

Palos Blancos, while it was the “seat” of ACDI/VOCA in the area of Alto Beni, did not have an effective water or sanitation system. Sewage ran in the streets, shortages were common, and while the area is water-rich, the people of Palos Blancos are much more concerned about water than the people of Sapecho. The people from Sapecho knew this. Not only did seeing Palos Blancos’ problems make people more aware of the benefit of their WatSan system, it made them more worried about keeping those benefits coming. The fact that Palos Blancos’ problems were not necessarily due to a lack of WatSan development and projects, but instead due to their failure, arguably because of conservation issues, made the issue even more nuanced. As Juan sums up:

*“So, many people say: I don’t want to go to Palos, but the people, they go there for the business. On the other hand, here, there aren’t many people here, but the people want to live tranquilly and happily. And right now the most enviable area in the region is Sapecho. Why? Because of the water. Everyone says Sapecho has nice water. However, in Palos, they had three or four water tanks that have died, because they’ve cut down the forest there. There isn’t any more water, in their area they don’t have it.”<sup>44</sup>*

Fourteen different respondents, unbidden, brought up Palos Blancos as an example of WatSan failure, problems with conservation, or comparative water poverty. The effect of Palos’ situation was to both provide evidence for the lack of attention to WatSan management and conservation, and to serve as a driver for conservation and development activities. This was by no means the only factor that mediated Sapecho residents’ relationships with their WatSan

infrastructure, but a certain amount of comparative water wealth vis-à-vis Palos Blancos was evident. Other areas, such as nearby *Mosetene* communities and smaller surrounding towns also lacked the benefit of the system as well. Furthermore, those who did not live in Sapecho proper but did live within the megaproject did not have access to sewage and wastewater treatment, and people in Sapecho knew it. Beyond this, larger tensions with water in the Bolivian state, such as the widely known water wars in Cochabamba, shortages in the Chapare, and other concerns related to water at a country-wide level, influenced individual experiences with and expectations regarding water and conservation. Relationships with Palos Blancos were and will continue to be a key issue for Sapecho residents.

### **Syncing Frameworks and Practicalities in WatSan Development**

It was difficult to leave my field site when I knew things weren't working correctly with the WatSan system, and it was even more difficult to leave when I knew that there was little to no chance that the funding and support for the maintenance and fixes for the system would be available. USAID and ACDI/VOCA are no longer working in the area, and the likelihood of gaining assistance from the Bolivian government for a system that is already, even in only partial working order, superior to the systems flanking it (especially in Palos Blancos, where sewage is literally flowing in the streets) is slim to none. I haven't been able to return to the area, and my lines of communication with the field site are extremely limited. Still, I have two colleagues (Bolivian and German) who work in the area and have filled me in second-hand on what's going on in the community. With that caveat, that this information is second hand, I do want to share potentially difficult components of future research in the area as an afterword.

The region around Sapecho is becoming more developed. Palos Blancos, even within the two years that I was working there, doubled in size. Now it has grown even more, and with this has come increased crime, narcotraffic, and coca growing. Pressures to grow coca have influenced individuals in Sapecho, who are trying to resist the spillover from Palos Blancos'

changes. Reports of shootings, physical violence, and upset were shared with me, as people are feeling less safe and are being pressured to change their lifestyles.

Furthermore, Palos Blancos has an eye on Sapecho's water system. As the system is failing in Palos, and there is sewage in the roads and constant cuts to running water, Sapecho residents are being pressured to "share the wealth." Even when I was doing research, Palos Blancos residents would come to bathe and swim in Sapecho's rivers, but now they are trying to move in, share, and divert Sapecho's water. This will lend increasing difficulty to an already stressed system.

I intend to continue research in the area, and I expect that the themes of coca, relationship with the government, and comparative "wealth" in terms of water will become even more relevant to the position of Sapecho. Furthermore, I expect that the system, which as I note above as already stressed, is now working even less efficiently. Responsibility for WatSan, in the last two decades handed over to NGOs like USAID, now is taken by no one except for the community members who are unequipped, both financially and technically, to care for the increasing needs of the system. How this will play out in the long-term, and how it will impact social and ecological lives, is a continuous (not static) process. From my fieldnotes:

*Everyone here in Sapecho is scrambling to figure out what to do once ACDI/VOCA leaves. All the development professionals want to help with the problems that Sapecho is facing, and the ACDI/VOCA people are as helpful as they can be, but that's it, there is no more money. The people in the community are worried about themselves but also genuinely worried about their NGO counterparts who are now about to be out of a job. One community member said that he felt bad that they wouldn't get any help from ACDI/VOCA anymore, but that he understood their contact person with the agency was preoccupied trying to find a job, he got that.*

The dangers of diminishing WatSan aid were clearly a concern for Sapecho residents, and the ways in which Sapecho residents choose to balance their space, identity, and WatSan resources vs. WatSan development needs and agents will be integral to their own health and the health of their environment. I can only assume that future relationships with development will be moderated by the various levels discussed at the beginning of this chapter, and that other NGOs and organizations will insert themselves in this process for Sapecho.

### **Connecting Theoretical Responsibilities and Transnational Realities**

For both local communities and agents of development, there was situated knowledge that the transnational nature of development was working due to the inability of states to provide development needs. However, I would caution development agencies not to take this responsibility as a prescription for completing any development anywhere, and would caution them not to underestimate the agency of individuals and communities in the areas where they develop. They should also not assume that just because relationships are amiable and mutually beneficial overall, that this benefit extends to all within a community or region. Furthermore, they must be careful not to assume that just because community members appreciate aid of one kind, that all wish to continue these relationships forever.

Appreciating community agency, encouraging an eventual “end” to development, deconstructing the idea that NGOs are “rights guarantors” and interrogating the privilege and unquestioned beneficence of development is necessary in the long-term. However, we must work in the present. As of now, the loss of NGO-assistance in Sapecho is detrimental, and the need for development continues. Individual positions within the neoliberal, multi-constituent realm of WatSan in Bolivia are both seeing their rights vis-à-vis the state lessened (as state power becomes smaller and more decentralized (Kohl 2006:307)) as well as the NGOs engaged in WatSan provision affected and expelled by the vestiges of sovereignty that the state



wields. Still, hegemonic structures of neoliberalism can be fought through social protest and movements (Arce and Rice 2009, Kohl 2002, 2007). Whether or not that is the right move for Sapecho, which is not already involved in a great deal of protest or action based on rights conceptualizations, is not certain. Sapecho residents, far from fitting the academic trope of the Bolivian protester, were more concerned with the everyday than with fighting the system. What is the way forward for them, if neither neoliberal nor social movement strategies are sure to provide development needs?

I argue that for Sapecho residents, perceptions of a weak state, lack of support, an unsure aid environment, an inability to achieve their own development (due to funding and resources, not want or physical ability), reliance on projects, and general distrust of sustained outcomes in development, more broadly are partly to blame for a healthy pessimism about the WatSan systems' sustainability, and about development benefit and assuredness overall. Individuals were not all speaking from a position where they understood the intricacies of infrastructure upkeep or conservation of water sources. They were, instead, speaking from a wider development perspective, wherein even good projects go bad quickly and communities and individuals rarely have the power to address these problems.

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<sup>44</sup> Entonces mucha gente dice: yo no quiero ir a Palos, pero allá van por el comercio, la gente, en cambio aquí, no hay mucha gente, pero quieren vivir tranquilos y felices, y ahora la envidia más grande de la zona es Sapecho, ¿por qué? Por el agua. Todo el mundo dice: Sapecho tiene linda agua. Palos en cambio, ya ha tenido, tres, cuatro tanques de agua que ya han muerto, porque lo han quitado el bosque, no hay más agua, en su área ya no hay.

## **CHAPTER 9:**

### **CONCLUSIONS**

There is now an urgent need for synthesis in approach and practice in water and sanitation is imminent, and the contributions of anthropologists and social scientists are essential. The more we envelop WatSan development and infrastructure studies in a socially-minded yet environmentally-aware approach, the better WatSan technologies will appropriately meet growing need for water, sanitation, and sustainable access to both. Political ecology has proven an excellent framework through which to view WatSan positions and outcomes. In this conclusion, I synthesize the main issues in WatSan raised in my study and I address potential issues in the future of WatSan research and approach. I begin by speaking to my original hypotheses in brief and by summarizing the emergent foci of my study. I then address broad-based theoretical concerns for water and sanitation from a praxis-based approach.

#### **Revisiting Hypotheses**

My study aims were targeted in that they were designed to address WatSan issues in rural Bolivia, but they were also iterative and exploratory. My original hypotheses speak to my initial expectations and concerns for the system in Sapecho. These hypotheses remain relevant, but have been layered into my findings based on an ethnographic, heuristic approach that allowed for emergent themes and issues to drive my analysis and presentation of data. I here revisit my original hypotheses for my work and address the findings related to these hypotheses in brief with reference to the chapters that highlight the findings. I then discuss the main emergent concerns of my study and how these hypotheses relate to issues in WatSan development and a political ecology of water and sanitation.

*H1: Global (transnational) human rights discourses will drive development organizations' frameworks surrounding water and sanitation.*

While transnational ideas about human rights were related to individual development professionals' ideas about water and sanitation, the actual driver for development organizations' interest in WatSan development was not so clear-cut. A confluence of basic needs-based development aims, U.S.-based relationships with coca-growing areas, Bolivian government aims, and local communities' wants were intertwined in the process of development for NGOs and GOs working in Bolivia, and all of these aims combined made it such that WatSan was a priority (see chapter 3).

*H2: Residents of Sapecho will have limited knowledge of human rights discourses surrounding water and sanitation.*

Sapecho residents' knowledge of human rights, in the sense of transnational rights discourses spearheaded by the UN, was limited. Their rights consciousness more broadly, however, was part innate, part cultural, and part situational. This multi-layered approach to rights still provided an understanding of both water and sanitation as rights (See chapter 4).

*H3: Residents of Sapecho will believe that water is a human right, and have a working rights discourse surrounding water that is local in nature.*

While residents of Sapecho had limited knowledge, overall, of the UN dictate of WatSan as a human right, the right to water was deep-seated in the community. This was more because of the Bolivian government's position that water is a right, indigenous and cultural understandings of the value of water resources, and the political and social blowback from water scarcity and privatization in other areas of the region and country. The right to sanitation was more complex, with individuals willing to call it a right, but the conceptual framework for that right was much more ad hoc (see chapters 4 and 7).

*H4: Residents of Sapecho will exhibit a disconnect between their rural indigenous identity and the indigenous identity of labor/indigenous groups in urban areas as surrounds water.*

Acceptance of indigenous identity and relation with indigenous rights frameworks was not a given in Sapecho, despite the fact that many of the residents came from technically indigenous backgrounds. While some residents did identify with indigenous rights frameworks, most in the town conceptualized their identity as more intercultural and gave more attention toward work, trade, and development than a collective indigenous rights concept. Furthermore, some responded negatively to the idea of being “indigenous” and instead argued that the Mosestenes were indigenous, and the town of Sapecho was intercultural. The conceptualization of identity as intercultural, and the rejection of concepts of ethnicity or indignity, was clearly stated by many respondents. Many individuals in the community, however, still felt a strong sense that the rights of the community were more important than the rights of the individual. Community members often explained their identity as community-based and regional (see chapters 4 and 8).

*H5: Residents of Sapecho will point out problems with the infrastructure of the water system put into place (potable and treatment).*

The residents of Sapecho were in a position to be both aware of and completely unable to address issues with the WatSan system. While some locals were not informed about WatSan issues or management-level problems, those who were engaged in the process identified issues with chlorination, water pressure, sewage collection connections, and wastewater treatment functioning. In addition, money, time, and expertise were all mitigating factors in their ability to actually address these problems. Furthermore, culture, the general perceptions of the community, and influences from a variety of levels caused tensions in their management of resources (e.g. choices about chlorination) (see chapter 5, 6, and 7).

*H6: Residents of Sapecho will point out issues with water rights and WatSan and ecological rights discourses (at the global, national, and local levels) based on on-the-ground issues with*

*infrastructure, governance, and use.*

Sapecho residents noticed disconnects between stated water, sanitation, and ecology rights discourses at a variety of levels through practice-based problems. They noted the fact that rights are difficult to enforce at the local level, and addressed the divide between political and theoretical “propaganda” related to rights and the actual coverage area for WatSan in Bolivia as well as the individual experience of their own community. Most notably, locals thought Bolivian government rights discourses related to WatSan and Mother Nature were all hype and political posturing with little-to-no actual practice (see chapters 4 and 5).

*H7: Residents of Sapecho will report problems with the community management model.*

Some respondents did not report problems with the community management model or had no recommendations on how the model could improve. However, those who did report problems recommended specific and achievable changes to the committee structure (see chapter 6).

*H8: Residents of Sapecho will have organically begun to work out issues with the management process as regards governance and upkeep, but will not have adjusted for marginalized groups within the indigenous area (including class, age, ethnicity, and especially gender).*

The water committee and engaged community members did begin to address issues with community management by extending term lengths from one to two years and addressing concerns with the system’s sustainability (e.g. source protection and procurement). However, inclusion in the management process was limited. Women were marginalized, as were certain age groups and economic statuses (poor and people who were not homeowners). Ethnicity was not identified as a marginalizing factor. Furthermore, due to emergent concerns with WatSan access and the cost of water, I would argue that some of the issues addressed by the committee were not actually those that required immediate attention (see chapter 6).

*H9: Residents of Sapecho will provide information on how to better water systems’ implementation.*

Sapecho residents' experience identified areas of concern for WatSan implementation.

Individual community members were more likely to provide information on how to improve individual water and sewage collection access than to give specific technical recommendations.

Water committee members gave information on technical issues with the WatSan system, but also were less informed than the operator, from whom the most accurate issues related to WatSan infrastructure were gained.

*H10: Global, national, and local rights discourses surrounding water, environment, and indignity will clash and blend within the context of water systems development in the rural area of Sapecho.*

In Sapecho, understandings of rights, environment, water, and sanitation were all based in personal choices and relationships with a variety of perspectives ranging from the global to the local. I would add that perspectives on development, and specifically WatSan development, were constructed from an interesting juxtaposition between national discourses (generally characterized as anti-USAID and U.S.) and local experience (generally characterized as pro-USAID and U.S.). Perspectives on development, then, were both attendant to wider concerns within the country but also intimately related to personal and local experience. Assuming that the national perspective on US-Bolivian relationships forwarded by the Morales government is supported by the whole of Bolivia would certainly be false (see chapters 4 and 8).

*H11: Residents of Sapecho will feel that potable water is a right and value it more strongly than they will feel that sanitation is a right, and they will value the potable water system more than the sanitation system.*

Valuation of the components of the WatSan system was complex. While water was prized more than sanitation as a whole (as evidenced through participation and general knowledge levels), access to improved sewage collection was particularly valued by women and those concerned

about children's' health, and wastewater treatment was prized (by those who knew about its existence) first for its uniqueness in the area (one of the only wastewater treatment systems) as well as its position as a force for conservation. Rights conceptualizations were generally equally perceived for both components of WatSan (with both conceptualized as rights), thus, dichotomizing the true valuation of these resources is difficult (see chapters 4, 6, 7, and 8).

*H12: Residents of Sapecho will be more engaged in voluntarism and upkeep surrounding the potable water system than the sanitation system.*

Residents of Sapecho were much more engaged with voluntarism related to the potable water system than they were with voluntarism with the sanitation system. Sanitation management and upkeep was duly hindered by negative perceptions and a lack of voluntarism, and thus valuation of services and actual action differed. Respondents were much less likely to actively participate in or take responsibility for sanitation issues (see chapter 7).

Emergent concerns beyond the concepts and issues about which I originally hypothesized were also elicited through my work. Complex situated tensions between NGOs, conservation and use, management and participation, water and sanitation, and the multiple levels and influences at play in the WatSan development process were elicited through my ethnographic and multi-method approach. As such, throughout this dissertation I have allowed not only my initial aims but also those elements of WatSan which were unexpected, curious, or originally unseen to take center stage. These aspects, perhaps more than those that I knew to look for, are the ones that will continuously but surreptitiously affect the viability of WatSan systems in a variety of culturally specific and even individualized ways. Showing that these tensions exist, and examining the ways they express themselves, has been a key focus for me. I interrogate these emergent concerns further by speaking to the rights-based and political-ecological issues within my study and work to re-insert these on-the-ground findings into current theoretical models. Through this I harken back to original foci for the study – to see how well

development agencies serve to implement the right to WatSan, and to engage a political ecological approach in this endeavor.

### **The Anthropological Difference**

Foregrounding participant observation and ethnographic methodology was integral to addressing the intricacies and inequities of water and sanitation processes. It was only by engaging in lived experience at my field sites that I was able to ensure a grounded, rich, and nuanced view of the ways in which individuals participate in WatSan processes. It was the unexpected and “invisible” thoughts and experiences that were most telling.

I often illustrate the necessity of an ethnographic approach that does not make even the tiniest assumptions about an area’s relationship to water by using the following example: In the U.S., individuals shower once a day or maybe even once every other day. In Sapecho, the norm was to shower about three times a day. This was due to the heat and to hard work, and it was not seen as a waste of water. Decision making about how to use water for bathing was contextual, it was based on lived experience. If you haven’t been to Sapecho and hiked up a mountain to check on the water source or worked a day at the wastewater treatment plant, three showers may sound excessive. But, I assure you, from my own experience and from my interactions with those in Sapecho, three showers made a lot of sense. The key for me was not to assume that I knew individual practices within the home, but instead to ask about them directly.

Whiteford and Whiteford (2005) note that anthropologists must work to address environmental and human health issues stemming from water through “methodologically rigorous, theoretically informed, and socially relevant research” but also note that this is a large challenge (265). It is only by addressing these challenges head-on, and in many different regional locations, that anthropologists can infuse WatSan practices with critical, experiential methodologies that “catch” the initially invisible, historically rooted, or power-laden constraints to



system efficacy within a specific setting. Anthropologists need to work hard to both complete studies related to water and sanitation and to translate them to interdisciplinary and non-academic audiences (discussed further in chapter 10).

### **The Human Right to WatSan?**

*The rights to water and sanitation require that these are available, accessible, safe, acceptable, and affordable for all without discrimination. These elements are clearly interrelated. While access to water may be guaranteed in theory, in reality, if it is too expensive, people will not have access. Women will not use sanitation facilities which are not maintained or are not sex segregated. Having a tap which delivers unsafe water does not improve one's access. Human rights demand a holistic understanding of access to water and sanitation." [UN Website]*

The human right to WatSan is a confusing dictate, one that allows for but does not actually provide access to improved water and sanitation. There is no road map as to who should be responsible for WatSan access for populations, especially for those that can't get it from their own governments. And, even though the answer to that question is being handled by a wave of governmental and non-governmental organizations acting across national boundaries (such as USAID and ACDI/VOCA), the application and engagement of this right is unwieldy at best.

### **Coverage**

Coverage issues are key to some of the concerns raised in this dissertation, both within and outside of WatSan infrastructure recipient areas. When people get access to improved water and sanitation, they receive benefits from that system; however, the way that the system is managed may cause some to not be included in the system long-term (e.g. due to cost or lack of household infrastructure, or more broadly through system breakdown). When people do not have WatSan access, they don't have that set of advantages.

Zooming out from this, WatSan development by its nature has to be incremental, since everyone everywhere can't have improved infrastructure overnight. In the meantime, there may be disparate and difficult differences in power and agency between those who have and those who do not have access. Concerns about migration and driving the overhaul of traditional living by making WatSan access contingent on living in centralized communities may be raised. Politicalized choices of who benefits and who doesn't further compound the power debate in WatSan coverage.

In the long-term, the maintenance of these systems, at various stages of repair, will likely prove to be managed through ad-hoc and only semi-connected forces. The communities that have access to knowledge on maintenance and upkeep, and the money to keep the systems running (and running correctly, moreover), will have greater benefit, whereas others will be without that benefit, or even carry a burden (e.g. monetary, health-based). Therefore, I stress that this difference in access is not something that will end when everyone has a spigot in their kitchen. Nuances in the ways in which people are marginalized by or impacted by WatSan development, and the upkeep of the infrastructure that is part and parcel with that development, will continue to be relevant.

I also stress, however, that these critiques should not keep anthropologists and WatSan practitioners from trying to address concerns about coverage. I agree with Fredrik Barth that "it is hardly surprising that much of our [anthropologists'] work today takes its shape as a reaction to the onslaughts of postmodern, reflexive, and interpretive critiques – there is a need for us to pick up the pieces and somehow resume the tasks of regular anthropology, not by rejecting or ignoring the critiques but by transforming and incorporating them as improved sensitivity and skills" (Barth 2000:147). Letting this reflexivity and tendency toward circular critique diffuse within the human rights and development debate is certainly a necessary way forward for anthropology, and it must be a focus if we are to critically engage human rights. A political

ecological focus on marginalization and power, and methods and foci that elicit unequal benefits and risks, are central to this work, but not to the point of inefficacy.

### **Critiquing “Universal Coverage”**

Universal coverage, a goal propagated by both human rights derivatives (such as the Millennium Development Goal 2015) and individual agency mandates (e.g., Water for People’s “everyone forever” campaign) is great in theory, but in practice it comes up against real and problematic issues. As mentioned above, everyone can’t have improved water infrastructure right now. Implementing projects, as I have explained, gives some communities and takes others’ power away. Even after projects are placed, individuals’ ability to have a voice within water decisions and to have equal access to participation in WatSan management will be important to minimize power imbalance. Ensuring access to sanitation is especially an issue, largely due to the efficacy of systems’ management and peoples’ perceptions of that infrastructure. While universal coverage is a lofty and idealist goal, it is potential recipe for imparting at least short-term inequality, disenfranchisement, potential marginalization, exclusion, cultural change, forced migration, and ecological injustice. Ignoring that in favor of a potentially equally provisioned future is foolish.

Several questions arise from this critique: What will this future look like? Will traditional societies be forced to areas with centralized water systems? Will decentralized systems be adequately regulated and cared for? Who brings this coverage, and what power-positions, agendas, and predilections do they tout? Do the policies and practices subsumed under universal coverage (community management, metering, or even privatization) further engrain difference and inequalities? Who ensures this coverage is lasting? Where is the burden for this coverage placed? How do we ensure balance between humans and nature? Studies have already shown that the poor and marginalized are often those left without access in universal coverage approaches (WHO 2012:3), and that’s not even including the marginalization that is

occurring within areas that technically have “access,” like Sapecho.

Overemphasis on coverage without care for the interim social and personal costs of that emphasis is inappropriate and hinders us from addressing the need for human rights to WatSan. I will note that it is the pace and social inattention in the practice of this theory that is problematic, however, and not the potentially equitable endpoint. I also critique the savior-esque nature of the concept of ensuring universal access, with westerners and development practitioners taking the lead in “bringing” universal coverage to underdeveloped areas. Critical development theory aids us here (fueled at least at the start by Escobar 1995). Universal coverage campaigns bring a kind of moralist cultural imperialism, driving projects that may or may not reach everyone and that come part and parcel with infrastructure that changes local ecological and social systems. It forces change—and for *everyone!* (*forever!*). This cannot go unchallenged. Political ecology as an approach helps to disentangle the critique and the problem from the vantage of potential human and ecological benefit, and I think gives us applied ways to address the challenges of need alongside the aversion to hegemonic development discourses such as universal coverage.

### **Sanitation Spotlight**

While the human right to sanitation has been ensconced in the virtual halls of human rights at the transnational/global level, and while it is often parsed as riding the coattails of the right to water (often warranting a small paragraph or a note in the conclusion), the actual effectiveness of this right is still in process. I think that packaging the right to sanitation with the right to water is appropriate (certainly, on the theoretical level, these should be linked), but the practice of affording these rights in the community context shows the action and practice of providing them to be very different. Furthermore, discussing the intricacies of the right to water is very different from discussing the intricacies of the right to sanitation. While the same theories continue to be relevant: political ecology, human rights, water and culture, and critical

development; the ways in which these theories are applied to each sector differ. I argue that addressing sanitation, specifically, requires a different set of tools and competencies than simply water.

I had the pleasure of participating in an online moderated discussion about the right to WatSan, and about the conditions and complications of ensuring this right on the ground spurred by the special rapporteur for the human right to water and sanitation, Caterina de Albuquerque. This panel, while exploratory, only continued to confirm what I have written here; that cultural frameworks and perceptions surrounding sewage, as well as sewage collection practicalities related to maintenance and upkeep, can stymie the effectiveness of the system. Almost absent, however, was a discussion about parsing out the intricacies of improved access (through infrastructure) and wastewater treatment. Wastewater treatment, especially, has been glossed over both as a critical component of that right to WatSan and as a critical component of WatSan development, and one that I hope I have successfully given appropriate attention to in this dissertation.

### **Targeting and Scale**

Marginalization happens, on its smallest scale, at the individual level<sup>136</sup> in WatSan. I've shown, with the richness of ethnography, personal stories of hardship that stemmed from the WataSan system implementation and upkeep. The human right to WatSan (theoretically) is afforded at an individual level as well, and I wouldn't change the scale of that. It is important not to take away that individuality, or to occlude the intersection of an individual position within a WatSan environment. Looking at addressing the right to WatSan for *groups of individuals* is a way forward. This is effective in that it retains the spirit of individual rights (and gives these rights precedence over the rights of culture), and yet also addresses the greater needs and

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<sup>136</sup> Of course these individuals are impacted by the historical and transnational forces that affect their positions, but my point here is that the marginalization doesn't stop at the community, national, or regional levels—it makes it to the individual level.

benefits of the cultural and philosophical ties of groups, without giving precedence to the ill-defined and much-misunderstood constructs of “culture” or even “ethnicity” or “indigenouness.” Stagenhaven’s (2004) dialogue on the problem of cultural rights (in terms of what *culture* actually means) has informed this decision, as well as Goodale’s (2009) dialogue on the same. Shannon Speed’s (2008) discourse on indigenous rights (and the complex negative implications of this on individual rights such as women’s rights) also informed my choice of this level of analysis. At this level, people have the right to choose, as Speed shows is vital, “to struggle from within their cultural context to effect change” (2008:34), while retaining their individual rights as such. It also continues to respect human difference and even a universal right to difference (a complex issue brought to light by Turner and Nanengast 1997) with logical constraints. These are the same sort of constraints that Nanengast calls for in her later work, in which she states that there is a need for a “mediated and partial but still rather unfashionable universalism” (2004:110). Human rights and individual access are inextricably linked, and marshaling this link is the task of everyone in the rights-to-individual cycle.

A discussion of the moving parts of WatSan development needs to really begin—the question shouldn’t be “what can a community afford?” It should be “what can an individual afford?” The questions should get more specific than the family level, even – not “what can a household afford?” but instead, “what can individuals in this household afford?” We should try to delve into the individual in a way that is not usually seen in development, we should try to understand the specific, rich, motivations in a complex individual; thus not just “what do women want in WatSan,” but rather, “why does this individual woman want what she wants, and what can we learn from that?” Of course we must also keep this feasible, in that we cannot monitor and evaluate at the individual level all the time, but we *can* change the way we meet that level in M&E. The ethnographic detail embedded in this research has given a glimpse into the ways that development can have unintended and unexpected blowback on some “unseen” individuals. I think the problem here is that for some populations, WatSan infrastructure just

isn't affordable for everyone. And if that is the case, these projects will fail a portion of their target population, and likely fail in the long-term. At the sanitation level, access to sewage collection and wastewater treatment wasn't inclusive of all in the community, and thus the infrastructure was partially inappropriate from the beginning. If we truly want WatSan to be "available, accessible, safe, acceptable, and affordable for all without discrimination" (UN Website), we really need to re-examine the ways in which WatSan is implemented on the ground.

### **A Note on Critique and Benefit**

While a critical eye for these issues is necessary, it is also important that anthropologists and critical scholars remember that those working for NGOs and those within communities are widely doing their utmost to provide a necessary and important service. Many WatSan participants in Sapecho regarded their jobs as service-based. Most were working long hours in difficult conditions to ensure access to WatSan. Practitioners and community members alike were truly trying to make a contribution to the community good. When I note that WatSan processes must be critiqued, interrogated, and continuously assessed, I certainly do not say so in order to vilify those working diligently within the sector. Instead, I work to write in concert with the concerns and problems seen on the ground, and to foreground the voices of practitioners and community members who have raised concerns and critiques of their own. It is only by embracing missteps and infrastructural breakdowns as opportunities for addressing positive change that we can move forward. I would caution any anthropologist working in WatSan not to lose focus on the fact that the participants in your study are also those who will benefit most from it, and that critique should always be reflective of respondent-based concerns and constructive avenues for positive change. In chapter 10, I continue this discussion, and provide opportunities for NGOs and community members to engage the themes and problems shown in this work to better processes on the ground.

## **Place and Impact**

Sapecho's position, as discussed early on in this work, is both somewhat typical in Bolivia and yet divergent from anthropological literature focused on water issues in the country. This is particularly due to anthropology's focus on Cochabamba and water issues within that city, which is water poor, very politically engaged, reflective of strong indigenous rights frameworks, and already undergoing problems with pollution from wastewater (for more information on Cochabamba's social movements and their relationship to water, and water issues more broadly, see Assies 2003, Bustamante et al. 2004, Garcia 2005, Mehta 2013, Olivera 2004, Wutich 2009b, and Wutich and Ragsdale 2008). Furthermore, the community differs from anthropological literature that focuses on coca-growing regions and the politics of place within these communities (see Allen 2012, Conzelman 2008, 2007, 2006, Conzelman et al. 2008, Canessa 2012a). The study on Sapecho is important in part because it differs from the expectations about Bolivia as it presents the water and development experience of a population that lives within a comparatively water-rich, less politically and indigenously-engaged public. It should be emphasized that the community had an overall positive relationship with USAID and ACDI/VOCA, and that the ongoing relationship between USAID and the community stemmed beyond water and sanitation to other projects as well. As discussed in chapter 4, not all communities had such positive relationships with development. Sapecho's position adds to academic understandings of rural livelihoods, indigeneity, and voice in relation to the Bolivian government and US-based organizations. Identifying key areas of interest and need for this population, and coupling these themes with experiences from other areas in Bolivia, adds much-needed nuance and specificity to water and sanitation realities within the state.

## **Questioning Rights Action**

Whether or not WatSan is a human right is a theoretical question that has practical consequences, and I think that at the theoretical level it certainly fits the parameters of a human



right. However, in practice WatSan is far more difficult to action as a right than it is to label as one. I have discussed the ways in which both locals and development professionals struggle with the concept of WatSan as a human right, with both parties stressing at once the need for everyone to have access, and the need to keep access available. As reflected in the UN dictate, it becomes unproductive to discuss whether or not WatSan should be freely available for everyone for *free*. Instead, we should start a discussion about how to make WatSan freely available for everyone at the right price. And by that I mean the right price for *them*. Making water free is untenable and impossible, especially when you add sewage collection and sanitation needs to the mix. Making WatSan affordable, however, just might be possible.

One thing that people of Sapecho have going for them is that they feel WatSan is a human right, and they are theoretically provided that right both by the transnational concept of human rights and by the Bolivian constitution. One problem is whether they know that the constitution provides this (Mehta et al. argue that people in peri-urban Bolivia don't know this right is provided for under the law (2013:8)), and another problem is whether it actually does. While I am confident that the citizens of Sapecho knew the Bolivian constitution provided a right to water and to safe sanitation, there was an understanding that this right was a in name only, levied by an untrustworthy government for political purposes. Another piece of knowledge that Sapecho residents had is that they could not possibly create or even manage WatSan infrastructure properly enough to ensure access to WatSan, sustainably, on their own. Access to capital, to external assistance, to "projects" seemed to be the only way forward for them.

### **Expanding Individual Rights and Meeting the Environment Halfway**

The human right to WatSan implies that these rights will be available now and as we enter the future. While the rights go to the individual level, they don't really expand to the environment or to the wider watershed surrounding that individual. The good news is, if one takes the right to WatSan to its logical endpoint, it is an *ouroboros*, a snake eating its own tail.

The right to WatSan does, implicitly, include wastewater treatment and wider conservation actions. How these are implemented, of course, requires thought, appropriate technologies, and community collaboration. Global environmental justice campaigns have worked to link social justice and environmental justice at the practicing level (Mehta et al. 2013). However, they have also been critiqued as prizing environmental outcomes over the social sphere (Mehta et al. 2013). Interestingly, political ecology early on was critiqued as too sociopolitical and not sufficiently ecological by Vayda and Walters (1999)). Whether or not this Vayda and Walters critique is still relevant is up for debate, but both emergent critiques exhibit that the tension between the social and the environmental is present.

I argue that what we really need to focus on, rather than continuing to re-imagine this tension through new frameworks, is making the social, ecological, and *technological/infrastructural* work together in balance. A political ecological approach allows for this, and an interdisciplinary frame for WatSan research aids in this as well. So often, the infrastructural and technological components of WatSan become invisible in discussions of WatSan development, as well as WatSan rights. The “how” and the “what” are left out, let alone the “who,” in the sense of “who’s going to keep that WatSan system running?” While GEJ gives another lens through which to view these issues, I’m not convinced that yet another frame here is necessary. It is the human right to WatSan writ in a different way, and political ecology turned on its head. Broadly, making conceptual and theoretical social information actionable in environmentally specific-settings remains the problem of anthropology, whereas making environmental action informed and culturally relevant in social settings remains the problem of engineering and development. Marrying these spheres, and truly respecting each other’s positions, is an important way forward.

### **Environment, Protection, and Human Impact**

Real and extreme problems, such as the demise of food sources, people living in close

quarters, population pressures, water scarcity, rampant pollution, and extreme poverty spur an urgent plea for people to move to action on behalf of both the environment's right to exist and the need for human environmental stewardship. Revkin argued in 2002 that "it is no longer possible to separate people and nature" (2002:1), and this is both accurate and confusing for practitioners. The needs of humans, often addressed by development endeavors, also have a tendency to further jeopardize environmental systems and ecosystems. Brockington et al. (2006) elucidate a complex relationship between conservation, human rights, and development needs. This is especially difficult in areas where indigenous use practices are criticized by western-led development ideas and "sustainable" practices. Brockington et al. argue that there is a need to focus on coexistence between conservation and use, the politics of indigeneity and policy-making power, and choices related to protected areas, finally arguing that "the ultimate challenge facing conservationists today is not only to reconcile errors of the past but also to determine how to shape human interactions with nature in landscapes of which people are a part" (2006:251). Addressing this challenge in WatSan use and development will continue to be necessary.

In WatSan, NGO-based practices of conservation of water sources (both in human use and in securing access to water sources) that are necessary for the long-term outlook of WatSan systems and protection of surrounding landscapes (e.g. mitigating deforestation to protect source water) stem from conservationist ideals. In WatSan, a systematic and sustained set of practices and goals that prize conservation goals are implemented in widely varying cultural settings. In Sapecho, several practices stem back to conservationist ideals, including water metering and protection and purchase of source land (as noted in chapter 5). None of these are negative practices inherently, and all are necessary to ensure the sustainability of the system. Still, the ways that these practices are implemented in Sapecho have had unexpected outcomes, and these outcomes need to be critiqued and addressed. Here, political ecology

comes into play, as people are marginalized by the ways in which changes to the environment impact their socioecological lives.

Moran states that human agents are not just the problem but also can be “solutions” (1999:5). Preservation initiatives and protectionist attitudes are rampant and well-liked on the Western front, -but, to whom and for whom (or what) are western protectionist “solutions” working? Is preservation just a new form of ethnocentric and western treatment of resource rights? Or is it the only way forward? So often, environmentalism is spoken about as akin to environmental protection/development, with the specter of environmental demise looming over the western ideal of progress. But how do we translate these practices and philosophies to an increasingly globalized world? And, how do we handle all these issues in Bolivia, one of the poorest countries in the world? Linda Farthing recounts this question in a different way from her work, wherein she relates a question from an official from the Ministry of Environment and Water in Bolivia that brings up problems with conservation issues. This official, Mirso Alcalá asks, “How are you going to tell someone struggling to feed their family that they can’t cut down a tree, dump garbage, or irrigate their crops with dirty water?” (Farthing Nd). There is a dialectic here, with conservation initiatives on the one side and the need to have a livelihood on the other. This conflict is influenced by a wide array of issues, such as power, access to resources, economic status, and even worldview. This dialectic is a necessary frame of reference and attention for WatSan implementers and users. If indeed the “social and hydrological are conceptualized as mutually constituted” (Whiteford et al. in press: n.d), examining the ways in which these issues interrelate along land and indigenous boundaries is integral to the study and practice of WatSan and focus on sustaining these infrastructures in the long-term.

### **Infrastructure as Key to Approach and Impact**

I noted at the beginning of my research that I chose to study water and sanitation development from the infrastructure out; what drives infrastructure placement, and how does

that infrastructure impact local communities? I also addressed how local communities' ability to address that infrastructure and its needs mediates its efficacy in the long-term. Further, I have shown how the very placement of WatSan infrastructure both gives and takes away power, and that the infrastructure itself may give rise to new potential for labor (e.g., maintenance) and profit (e.g., wastewater treatment). As Ashley Carse states, "as landscape becomes infrastructure for one system of production, rather than another, a different group of environmental services (purposefully selected from a multiplicity of possibilities) becomes relevant" (Carse 2012:539). My work shows that the placement of WatSan infrastructure is politically-decided, it creates unclear boundaries between those who have access to it and those who do not, it creates new labor (e.g., cleaning the tanks) and changes old ways of using the resource that it carries (e.g., washing clothing at the river vs. in a sink). What's more, I have shown how the WatSan operator is often made invisible within the larger structure of the WatSan system's development. I have also showed that WatSan development changes the surrounding environment and individual perceptions of that environment. Not only does WatSan development draw migration and more resource users, it also provides a way to use more water, create more waste, and, in the case of the failed system, pollute adjacent waterscapes. I have woven together focus on humans, infrastructure, and the environment by employing a political ecological approach that attends to each of these positions, backed by supporting theories of infrastructure studies, critical development, water and culture, and human rights. I have also showed marginalization both within the sphere of the new infrastructure and outside of it, showing both lived inequity on the part of WatSan infrastructure users and potential inequity stemming from the management, and I have called for more clear attention to both the internal and external inequalities caused by infrastructure placement. Beyond this, however, "infrastructure" is also used to address "more abstract entities, such as protocols (human and computer), standards, and memory" (Bowker et al. 2010:97). In a sense, I've employed a study of the infrastructure of infrastructures as well as the infrastructures themselves, and it is political ecology that thrust my

vantage on both the power-mechanisms surrounding and the position of infrastructure. I found that aligning perspectives on infrastructural regimes, appropriate technology, institutional training and memory, infrastructure-based standards, and enviro-social outcomes is key to a political ecological approach to water and sanitation, and aligning this within STS literature and theory could be useful.

### **Political Ecology as Process and Product**

Water and sanitation development puts power, control, and decision-making related to WatSan coverage and inclusion in the hands of an eclectic conglomeration of global, transnational, national, and local forces. Negotiations between these forces are a leading interest for political ecologists (Whiteford et al. in press: n.d). Vaccaro et al. (2013) argue that critical political ecology has much to contribute to the practice, as well as the theory, of environmental conservation,” but note that it will require improved acceptance of political ecological aims and improved collaboration between political ecologists at the academic level and non-academic groups working on the ground. Finding this synthesis is critical, yet difficult and nonlinear. Discussing political ecology must be a cyclic process, with praxis as a goal. Linking political ecology of water to political ecology of water and sanitation, furthermore, will be an unwieldy process, and will require similar improvements in collaboration as those raised by Vaccaro. As Whiteford et al. note, “one of the key concepts that has emerged from work in the political ecology of water is the need to understand the social, political, and historical situatedness of water access, rights, and control” (in press: n.d). I, of course, extend this to sanitation access, rights, and control. Encouraging political ecologists’ products (such as this dissertation) as a starting point for addressing these concerns in WatSan is necessary, but so too is turning these analyses and products into action. Political ecology’s use is theoretical, methodological, actionable, and applied, especially if we share and engage with others’ work.

Engaging WatSan practitioners in this process is paramount. As such, I address key components for constructing, engaging, and practicing political ecologies of WatSan here.

*WatSan Development Choices are Historically Situated:* Relationships between donor, funder, and recipient nations, as well as between donor, funder, and recipient communities are set within political, social, and structural relationships which are a product of often mutually constituted histories. These historical relationships are both direct and rhetorical, with action as well as discourse affecting these interconnectivities.

*WatSan Development Choices are Power-laden:* Power relationships, whether they be written based on national strength, position within global discourse, position within development, economic standing, or rural-urban relationships, affect choices related to development (e.g., in the case of Sapecho, WatSan choices were power-laden in part because choices of communities were made based on U.S. policies related to coca non-proliferation). It is also worth noting that power is intrinsic in both successful and unsuccessful development (Escobar 1995).

*WatSan Development requires the engagement of different levels:* Several different levels (see chapter 8) are involved in WatSan development, and attention to all of these levels and the ways in which they interact are important.

*WatSan Development gives Power, but can also take power away:* WatSan development and the infrastructure of WatSan gives power to certain communities. It cannot be value-free, and conceptualizing WatSan development as inherently beneficial or as automatically providing a net-positive to all involved is incorrect and shortsighted. For example, while the my study in Sapecho showed a perception of benefit for a many members of the population, a portion of that population was dissatisfied and disenfranchised because of the system. Addressing that portion, not ignoring it, is required. Furthermore, looking beyond recipient communities to those

nearby who do not have access, and looking at potential negative or disempowering effects for them is encouraged.

*WatSan implementation creates social and environmental changes, and these changes interact:*

WatSan infrastructure comes part and parcel with a semi-forced change to water and sanitation use practices. It also changes water and waste flows and traditional courses for water.

Diverting water for human purposes, and the ways in which people use these newly diverted sources, play off of one another. Looking at the situated relationships between these interactions is necessary, and can elucidate potential positive and negative effects to both humans and the environment.

*WatSan Practice is (temporarily) Bifurcated:* The practice of WatSan development is currently bifurcated, and water, not sanitation, is in the lead. The practice of WatSan prizes water provision at the development level, and lends less attention to sewage collection and wastewater treatment, as noted in chapter 7. This separate channeling produces and is produced by a perception of the worth of water vs. the worth of sanitation, and this needs to be addressed. Forwarding the provision of water without balancing the provision of sanitation and wastewater treatment only imperils the environmental system and causes long-term harm to human communities.

*WatSan Experience and perception is (temporarily) Bifurcated:* Communities both absorb global relative inattention to sanitation and also sense and perceive sanitation and wastewater treatment as less immediately important and actionable than water. At the human level, it is difficult to balance the immediate need for water and livelihood with the seemingly more nebulous idea of sustainability or environmental stewardship through appropriate management of waste. Senses, such as smell and distaste for interactions with waste, as well as perceptions of waste as a “dirty” job or “bad” product, influence action at the community level. Attention to water over sanitation is endangering the viability of sanitation systems as well as the long-term



effectiveness of WatSan systems. It also endangers environmental systems, especially when centralized systems collect and remove sewage only to have it incorrectly treated before entering the wider waterscape (as in Sapecho).

*WatSan use is culturally, historically, and individually affected:* Peoples' use of WatSan is cultural in that social experience as well as worldview affect use expectations (e.g. water valuation), historical in that local experiences and occurrences can change perspectives (e.g. regional scarcity), and individual in that people make their own choices, based on a variety of factors, about how to use water (e.g. number of showers per day). Peoples' use practices should never be assumed to be equal even within regional boundaries, and certainly should not be compared for "rightness" based on westernized use practices. Relativity in water use is necessary.

*WatSan Processes are Linked:* Water and sanitation infrastructure should be seen as two sides to a coin; water and sanitation are inextricably linked, and arguing the value or import of one vs. the other is unproductive. However, as noted above, this dissection of benefits and risks is often occurring. Conceptualizing and forwarding WatSan processes as linked, and the environmental, infrastructural, and social components of WatSan as mutually writ, is necessary.

*WatSan Action must be Critiqued:* WatSan development must be engaged and critiqued as should all development, even if it is hinged on the idea of providing the right to WatSan or universal good, and even though it is often viewed as an obvious net-positive experience by practitioners and agents of development. Any action related to WatSan has inherent valuation and power and requires cultural and environmental change. As such, critique (to the point of action, not inaction) is encouraged. Inequality during or because of the incremental process of ensuring access to WatSan is just as important to address as inequality because of lack of access.

My study of WatSan processes geared toward providing infrastructure to residents of Sapecho, Bolivia, exemplifies these concepts by showing a specific set of relationships. While access to the improved water source in Sapecho was lessened by the metering system implemented, there is no reason to believe that the benefits of metering would be completely lost in future endeavors. Implementing metering reasonably and in an individually-focused way could marry conservation needs with human imperatives. There is an understanding on one hand that water, a scarce resource, should be best kept by attaching a price to it and requiring its care; on the other hand, setting water up to be used and consumed and paid for by others is considered a “theft of a common good” (Page 2005:294). Beyond this, “the perception of critical resource scarcity — current crisis or impending doom — can also be manufactured and at times exploited to meet various agendas” (Johnston 2003:85). Being careful to ensure that common goods are reasonably redirected through infrastructure meant to ensure improved access, remembering individuals’ positions as a recipient of a new WatSan paradigm, and ensuring that resource scarcity is not blown out of proportion, are key to ensuring WatSan rights in an ethical way.

Management of WatSan infrastructure was a complicated process that was moderated by NGOs, local communities, and individual choices about participation. The long-term efficacy of community-based management was hindered by migration, lack of economic capital, lack of trained individuals and confidence in those who were trained, as well as unclear long-term support structures for maintenance of systems. Management practices were also infused with pre-existing inequalities based on gender, age, and economic status, and the ways in which community representatives further engrained these inequalities by their choice of representatives and the treatment of those chosen (especially in light of NGO expectations for equity and inclusion) were problematic, but not impossible to address. The knowledge that relationships with NGOs have been severed, however, makes adequate attention to these tensions less likely to occur.

Even though wastewater treatment and sewage collection emerged in my study as more problematic aspects of WatSan upkeep (for a variety of reasons) I do not advocate that they be left out of WatSan projects or rights. In fact, just the opposite; I maintain that sanitation is an integral aspect of WatSan provision, and that to complete a water provision development project without also addressing sanitation, sewage collection, and wastewater treatment concerns, would be irresponsible and narrow-minded. The overall success of the right to water requires the overall success of a right to sanitation, and vice versa. If water is life, so is waste. “Waste is life”, while decidedly less catchy, is just as true. Relationships with waste are just as present, and the absence of available, accessible, safe, acceptable, and affordable wastewater treatment practices just as risky, as are relationships with and absence of water. Encouraging appropriate, affordable, and (above all) sustainable infrastructure, is key to these approaches. Looking to engineers to assist by using appropriate technology or Life Cycle Assessment approaches is important. So too is infusing these approaches with relevant and specific cultural data.

While in Sapecho irrigation was not a clear concern for water use, and while this need did not further problematize water consumption, certainly, in other areas, the food-water relationship will be more present. In this case, tensions between groups over how these requirements are prioritized may be paramount (Roncoli 2010:12, Parregard 2013). Looking at wastewater reuse and grey water reuse could lessen pressures on conservation for the community as a whole and ensure long-lasting availability of the waterscape. Still, ensuring that these practices are appropriate and most of all wanted and acceptable in the area where they are placed is key.

While this study focuses on the relationships inherent in the WatSan process of giving access to residents in Sapecho, the findings from my study can be extended to look at potential areas of concern and potentialities for improvement that could be seen, applied, and replicated in the WatSan development process as a whole. The following chapter, entitled “Applications,

translations, and calls for future research” (chapter 10) addresses how to learn from and engage these findings in interdisciplinary, applied movements for WatSan development.

### **Concepts and Attentions for Change**

For WatSan management practices to really change, concepts and perceptions of WatSan development must change at several levels and in both large and small ways. The following conceptual foci are a synthesis of my findings and recommendations for the academic and working WatSan community:

*Equity in implementation sites* (less politics, more practicality). WatSan program locations in Bolivia have been chosen as a part of a mélange of political requirements; however, as WatSan moves forward NGOs must be careful not to allow prioritization of their own political aims create inequitable relationships between communities, especially between indigenous and intercultural areas.

*Attention to culture.* Attention must be paid to culture in the implementation of WatSan programs, both at the technical (appropriate technology) and the individual (reasonable training and acceptance) levels. However, this should not necessarily be done at the expense of necessary components of WatSan upkeep or hygienic, sanitary use. Reasonable accommodations must be made to ensure that WatSan systems are operable, that funding is sufficient, and that long-term management is possible. Further, if behavioral change is necessary to ensure full benefit from WatSan, this should be carefully and respectfully encouraged. Flexibility in the type of systems implemented (e.g. centralized or decentralized) and their components at the household level (e.g. types of toilets) should be offered.

*Affordable—not free.* My work indicates that WatSan upkeep and management has a cost to the user and to the implementer. At this point, as is explained in the theory of the human right to WatSan, access must be affordable, but not free. This is particularly problematic, however,

when wastewater treatment and sewage collection are included and this cost is put back on the user or the community. It is also problematic when the individual level is obscured by wider focus levels such as “community” or “household.” Ensuring that the right to water and sanitation is affordable for the individual is paramount, but difficult. Re-examining the ways in which development conceptualizes cost and access are important here. As a start, water consumption should be billed per head, not per household. Renters should be included in this headcount, and landlords should be required to pay for renters’ full usage needs.

*Sewage collection and wastewater treatment are a must, but less can be more.* Less complex infrastructure for sanitation may be more appropriate in community-managed locations, especially when the onus of upkeep and operation is placed on community members with little-to-no economic resources or technical expertise. In these cases, providing adequate but not state-of-the art practices could be appropriate. Further, decentralized rather than centralized systems may be useful, although they can be more difficult to regulate. Implementing complex systems that will fail due to lack of upkeep does neither NGO nor community any good. Still, careful attention needs to be given to the power that is laden in the process of choosing these technologies. From a human rights and equity perspective, it is certainly important that the benefits of WatSan are equally distributed, and thus implementing half-measures in developing countries whilst developed areas have the best of technology is going too far in the other direction. Theories on appropriate technologies can assist with this balance, but I argue that a political ecological and even a critical humanist approach is also necessary. Regardless of type, for human-environment relationships to balance in waterscapes, sanitation and wastewater treatment must be implemented.

*Appreciation and valuation of difficult jobs.* When individuals are trained to do a job that requires technical training or expertise, difficult or dangerous working conditions, or potential social harm, they should be compensated for this as part of the project’s original fee for a period of no less

than three years. NGOs shouldn't just create infrastructure, drop it, and leave the income of the operator to the income for the system. The cost of an operator's training hours should also be included, as well as their eventual payment for passing along their knowledge.

*Community participation, but also specialization.* Community members should participate in WatSan projects, and the inclusion of days of work and a counterpart payment is appropriate and useful to encourage community ownership and responsibility. However, giving days of work, money, and components should be reasonably affordable for individuals and there should be a catch-all for people who may be left out of this system because of socioeconomic level and ability status. Beyond this, though, inclusion and participation should not obscure the fact that specialization is required for effective WatSan upkeep. If community management is enforced, it shouldn't just be the operator(s) that stick around for the long-term. Ensuring that there is a systems manager or other long-term employee of the WatSan system is, I argue, integral to its success. While sharing the burden brings togetherness and respect, discouraging expertise through constant turnover for the water committee is a distinct detriment to WatSan upkeep. If individuals have the desire, there should be a system of support to reward their expertise and training with long-term support and pay.

*Gender equity, but not at undue burden to women.* Gender equity is an important overall goal, but the focus on women has become onerous in WatSan. Focusing so heavily on a numbers game of women's inclusion can create backlash and subversive, "beat the system" fixes. We must make sure that women are included, but even more so we need to make sure that women aren't hurt because of this inclusion. Ensuring that WatSan systems' construction, management, and use is infused with a feminist perspective is important. As Ahlers and Zwarteveen argue, a feminist analysis of water security "not only entails a more refined analysis of questions of water allocation, but also a dismantling of conceptual abstractions that reify and reproduce boundaries and binaries such as those between the natural and the human

and the private and the public” (2009:419). This analysis and dismantling certainly applies to WatSan development processes as well.

*Reuse incentives.* Reuse should be incentivized at the consumption level. Reuse of grey water (before it even enters the wastewater treatment system) could assist in lowering costs as well as ensuring the long-term accessibility of fresh water sources.

*Wastewater reuse—safe, affordable, and communal.* If the community owns the wastewater treatment plant, the effluent should be reused to the benefit of the community. Reclaimed resources from the system should benefit all. However, in the case of Sapecho, methane capture and effluent reuse would not be particularly feasible at this time as there are issues with wastewater treatment efficacy. Issues of whether wastewater reuse would actually be useful, whether the installation and maintenance of these systems would be reasonable (both cost and labor-wise), and whether long-term risks and benefits are balanced should be considered.

*Conservation, but not at the cost of infrastructure upkeep.* Conservation is certainly a goal for WatSan systems, but it will do no good to conserve at the expense of the efficacy of the WatSan systems themselves. Funding needs to be prioritized to ensure that the current system works.

Regardless of good intentions and expected outcomes, there are some contingencies for which NGOs and local communities simply cannot. Furthermore, it simply may not be feasible to have long-term (e.g., more than one year) support from NGOs on WatSan projects. I also accept and am aware that these recommendations are somewhat ethnocentric, or at least hypocritical. Ideally, the West would follow these same rules of conservation and reuse. Every once in a while, someone I was interviewing, after or even during our discussion, would ask for an aside. I’d stop the tape, and they would ask something along the lines of—“Okay, I know that you’re interested in all of this and that WatSan is important, but how do you handle water and sanitation in America?” I answered honestly, that I didn’t know, and that yes, Americans

overuse water and throw things away, and that no, I don't know where my sewage goes after I produce it let alone know who the people are that take care of it. That being said, accepting these limitations, as well as situated tensions between those who are addressing theoretical and practical implications of development and individual communities is paramount to creating flexible, iterative WatSan process. By encouraging those who work in WatSan at all levels to critique and address their own position as well as the position of those that they study (in my case NGOs and a local community in Bolivia) is key. These concepts and attentions encourage the WatSan practitioners to address political ecological aims, such as power relationships, marginalization, and human-environmental relationships in a practicable way.



## CHAPTER 10:

### APPLICATIONS, TRANSLATIONS, AND CALLS FOR FUTURE RESEARCH

*“One lesson that Bolivia teaches us is about the wide gap between theory and reality”*

-Jim Schultz 2008:291

Focusing on Bolivia, as Schultz notes, is a good place to see gaps between the theoretical and practical levels, and WatSan is no exception to this rule. It is easy for academics to complete research at the “ivory tower” level and then leave only a little something for those outside the academic community. Anthropologists, especially, are critiqued for this (see Eriksen 2006 for a good summary). Encouraging applied focus on policy involvement and community-level change is a clear goal of mine, and could easily be a focus for other WatSan-interested anthropologists with the correct tools.

I begin this chapter by critiquing current monitoring and evaluation (M&E) techniques employed in WatSan, and opening the door for anthropological approaches. I then discuss these anthropological approaches, critique them, and encourage their inclusion in the wider WatSan process. My main hope here is to encourage true praxis. I give clear policy recommendations and a development practitioner and community checklist at the end of this piece, tools that I hope can be employed in the sector and encourage a political ecological approach to monitoring and evaluation issues.

#### **Critiquing Monitoring and Evaluation**

M&E is a central component in ensuring that WatSan development programs are both held to the standards of the goals associated with the project and that the lessons gained from individual projects at the local level can contribute to future goals, projects, and frameworks.

Unfortunately, M&E for WatSan development is currently unwieldy. Methods are non-standard and opaque, and data-sharing between practitioners is not widely practiced. I argue that there is currently no established M&E system that is capable of fluently feeding future theory. Problems, including lack of design, lack of a sufficient sample size, lack of data quality, and data collection error tarnish results; and problems such as uncertain safety conditions, variable local support, and lack of local staff that are capable of implementing the project are on-the-ground issues that make gathering M&E information difficult (Tarsilla 2012). Once these data are collected, “at best this information [from WatSan M&E] is used to influence operational changes [for one organization]...at worst, information from monitoring has been simply ignored” (Shordt Nd). Both data collection and data use need to be rectified in WatSan M&E.

For rural areas, M&E is even more difficult-- rural areas' M&E campaigns can be forgotten or masked in many approaches. These sites can be eliminated from state-level statistics (or at least improperly counted at the national level), thus leading to a poor understanding of their position (Bosch 2011). Corruption and issues of inter-area politics can also make rural M&E difficult (Churchill 2009). Furthermore, many M&E approaches present data related to projects in aggregate form (e.g. total percentage of water systems implemented/latrines implemented) and fail to delineate community-specific issues. Thus, particular problems in one rural community may be masked by good status in others.

### **Aggregates, Check Boxes, and Quantitative Methods**

This tendency to use quantitative and aggregate formats for M&E is widespread and understandable; more culturally-intoned studies can be costly and lengthy. However, while the traditional “check mark” approach<sup>137</sup> can serve to “prove” program implementation for funders, it can also obscure setbacks and difficulties in program implementation. Bernstein’s (2002)

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<sup>137</sup> This refers to the common tendency for NGOs and partner governments to check off elements such as “number of connections”, “amount of water used,” and “number of latrines built” (as seen, for instance, in Bernstein’s audit of the Yungas region programs (2002) instead of using more holistic approaches to M&E.

evaluation of the Yungas Development Initiative (YDI)<sup>138</sup> included checklists that offered information on a number of topics (e.g. agreements signed, latrines constructed, and individuals treated for diarrheal disease) but included no component that gained information from local recipients.<sup>139</sup> The Food, Nutrition, and Technical Assistance (FANTA) project<sup>140</sup> uses similar indicators, including the percentage of the population with access to facilities, the percentage of the population with access to water facilities, and the amount of water used per day (Billig et al. 1999). Both are standard examples of quantitative-based M&E initiatives that collect little in the way of user-focused data. While these types of system-level indicators are important, they do not encompass larger societal issues or reveal problems with implementation. As I have argued in this dissertation, a complex set of historical, social, and environmental factors in one specific rural area may impact the effectiveness of a WatSan development approach. How can these “check-box” approaches capture such information? More in-depth surveys begin to address this gap. Balkilan et al (2009) completed post-construction support (PCS) initiatives that employed more holistic survey techniques, which provided an improved base of data and more complex results. These approaches, however, have been criticized for “reducing water users to passive respondents” (James et al. 2004). While quantitative methods have the potential to elucidate the WatSan process, what questions are asked, to whom, and how are central issues in ensuring effective results. I argue that, as of now, many of these projects are implemented with only partial success. It is important to encourage anthropological approaches that employ a political ecology approach, that are designed with suites of methods, and that include on-the-ground participant observation-focused endeavors at understanding WatSan users and the infrastructure that both impacts and is impacted by them.

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<sup>138</sup> My field site is located in this area.

<sup>139</sup> Rather the initiative focused on mission management and paper documentation (Bernstein 2002:7).

<sup>140</sup> The FANTA project is an NGO funded by USAID.

## **Participatory Movements in NGOs**

Newer participatory paradigms have been suggested for WatSan M&E by agencies such as United States Agency for International Development (USAID) and the International Water and Sanitation Center (IRC), perhaps in reaction to widespread critiques of the top-down methods discussed above. While these movements might begin to effect change in M&E practices surrounding WatSan, it is unclear the extent to which these projects are implemented in specific agencies (USAID, for instance, suggests the use of the approach but does not specifically require it; in fact, they just give the reader a link to the IRC's website). The IRC does offer their own case studies (approximately one per approach), supporting their use of participatory management and monitoring (including both Action Monitoring for Effectiveness (aMe) and participatory approaches including Methodology for Participatory Assessment (MPA) (James et al. 2004, Schordt 2000, Smits and Urrea 2003). The aMe approach is, according to the IRC website, programming that "focuses on decentralizing responsibility for monitoring to those with a vested interest in change for the better" (e.g. community members, stakeholders, governments, or activists). The aMe approach is meant to create a focus on issues that arise from WatSan implementation in a timely manner (IRC, Schordt 2000, Smits and Urrea 2003). MPA, on the other hand, encourages "village-level information to evaluate sustainability" and uses participatory tools to gain information which is then coded ordinally (James et al 2003). This approach responds to arguments against traditional participatory approaches in which case-study formats make it difficult to compare cross-program outcomes. MPA also turns participatory data into statistics, which programs and NGOs desire (James et al. 2004). The extent of cultural training and aptitude on the part of the implementer for both aMe and MPA approaches, however, is unclear.<sup>141</sup> Furthermore, I argue that such targeted approaches may miss issues that are more hidden, and prop up local hierarchies, a critique I have levied

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<sup>141</sup> Furthermore, the effectiveness of these participatory approaches have been critiqued in other sectors (Bouma et al. 2007)

throughout my work. Thus, I would say that anthropologists may not only be central to the execution of these approaches but also central to critique of these paradigms' inefficiencies.

### **Issues With Transparency for NGOs**

The lack of transparency and data-sharing in WatSan M&E is arguably one of its greatest hindrances. CARE<sup>142</sup> argues that “when adequate monitoring and evaluation efforts are made [in WatSan], the results are rarely published in a way that may be shared across the sector...for that reason NGOs...must frequently “reinvent the wheel” (CARE 2006). This means that, rather than moving forward based on lessons from past projects, agencies continue to make the same mistakes. My own field site received aid from USAID and ACDI/VOCA, and thus I used this project as an example for an M&E data search. M&E data on the project is not available through either website, nor is it available through Google, Google Scholar, or WorldCat searches<sup>143</sup>. This, to me, shows a divide between the project and the evaluation of said projects, although I do not know if this is intentional. I argue that neither USAID's nor ACDI/VOCA's strategy for M&E data sharing is transparent, nor do the organizations foster a climate favorable to the transfer of knowledge or methodology sharing. I argue that the lack of M&E transparency may be equally problematic as the lack of cultural information in M&E approaches. I also suggest that these issues with data sharing and transparency seem to be

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<sup>142</sup> Acronym only, an NGO

<sup>143</sup> Based on separate searches for both “Bolivia ICDF ACDI/VOCA” and “Bolivia ICDF USAID.” Both USAID and ACDI/VOCA do not offer M&E reports on country pages or linked to specific program pages. USAID's “Development Experience Clearinghouse” (DEC) does have searchable reports. Here, I found information on Sapecho's involvement in alternative development (2009), as well as their cacao project and various other reports (2003)—but no information on WatSan programs. Under the results & data section of USAID's website, I found the evaluation policy as well as their recommendations for M&E, but no specific examples of reports. ACDI/VOCA's website's Bolivia page allows a look into the potable water program, but only has information related to country-wide aggregate data and a link to “success stories.” In the “success stories” page on ACDI/VOCA's website, the Yungas region (where Sapecho is located) is held up as a success. No information is given on how this project has been implemented, its specific goals/targets, or the community impact of the program. I was unable to find M&E information for ACDI/VOCA on their website.

symptomatic of similar issues across many different M&E practices in WatSan,<sup>144</sup> as well as in evaluation more generally. For more information see the work of Jennifer Greene (2008) and Michele Tarsilla (2012). Wider frameworks for implementation, however, are more visible for NGOs. This is a problem that has also been identified in anthropological and scholarly work more broadly. Oftentimes, scholarly works are unintelligible for lay audiences, and use terminology and present data in ways that are opaque to the casual reader, not to mention that these articles are published in journals that have a cost associated with that reading (Kristof 2014, Eriksen 2006).

### **Focus: Problems with State-level Evaluation of WatSan Projects**

Ferro et al. (2011) look at the efficiency of the water sector as a whole for several Latin American countries<sup>145</sup> from an economic perspective, and thus this aspect of evaluation can be used to critique state-level and economic-based evaluation campaigns. This top-level analysis actually focuses on the management of entire water sectors and on the overall economic efficiency of these projects. While many development-agency-implemented projects in rural Bolivia are not privatized per se, methodological issues with the study of WatSan impact do correlate with methodological problems for research in these areas. They employ a Stochastic Frontier Analysis (SFA) to estimate efficiency. Variables included in this analysis included the volume of dispatched water, number of water clients, number of full-time staff, water mains length, operative meters on water clients, population served with domiciliary water, and water

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<sup>144</sup> Searches of the websites for Caritas, Habitat for Humanity, and Catholic Relief Services (CRS), for instance, also returned no information related to M&E practices on WatSan in specific country locations. Sites and organizations are popping up in response to the demand for better accountability—admittingfailure.com actually has an archive of WatSan “failures” admitted by M&E placement organizations. They have only 4 listed instances wherein NGOs and other organizations have admitted difficulties with their work. The AidData blog is a new forum to discuss M&E challenges for UN participants. These blogs and organizations asking for M&E transparency seem to point toward a greater need for transparency and advocacy, and I argue that this transparency and data sharing is central to future M&E approaches.

<sup>145</sup> Including Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

losses on total dispatched water (2011:214). The aim of this analysis is to show differences between the efficiency of these water sectors in a cross-country analysis. The model is meant to test deterministic frontiers within the model; if model variables are not deterministic the inefficiency in the system can be attributed to “noise” or other variables. The study found that all of these variables were deterministic at significance levels of at least 10%.<sup>146</sup> The significance of these measures, however, does not eliminate the significance of *other* issues; put another way, these are certainly not the only things that could be significant. Furthermore, the variables themselves mask practices that can actually marginalize water users (such as metering, which I argue can be detrimental to effective). And, the idea of creating the model itself based on efficiency in the realm of economic (or productive) capacity clouds what I argue should be the main aims of water and sanitation projects, including an individual’s right to water and sanitation and an individual’s right to health and well-being. Thus, a strictly economic approach to M&E at the state-level does not adequately outline either the conditions on the ground or the cultural/social environment in which WatSan programs take place. This neoliberal, market-based approach has been shown to be inappropriate for Latin America and Bolivia, especially. As José Castro argues, “the main claims put forward to justify these [WatSan] policies....that these policies contribute to reduced social inequality in these countries...are not supported by the empirical evidence” (2008:63). Thus, monitoring and evaluation initiatives that rest on neoliberal conditions as markers of efficacy and efficiency are largely inappropriate on a social and environmental level. In another work, Castro argues that if, as PSP (Private-sector participation) was meant to increase efficiency and social equity, neither the findings from nor the methods to assess these programs are appropriate (2010). Jennifer Davis adds that much of the research surrounding PSPs are actually in the form of case studies, and thus, “rigorous, independent, and systematic evaluations of local, regional and global experience with PSP would....be a valuable contribution to the field” (2005:156). She also notes that, in most studies

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<sup>146</sup> Traditionally, significance is monitored at the  $p > 0.05$  level.

surrounding WatSan privatization, “distributional issues receive limited attention” and states that “it is important to distinguish between problems of affordability versus access for low-income households within the privatization framework” (2005:165). Finally, she notes issues with the lack of inclusion of individuals who are not a part of the privatized system (2005:166). This case study shows how traditional national-level monitoring and evaluation techniques, quantitative analysis, and theoretical models (such as neoliberalism, in this case) can cloud the data gathered and the actual impact of systems. Not only do we need appropriate theoretical intentions surrounding WatSan program placement, we also need theoretical intention related to M&E. Furthermore, a praxis-based approach, which encourages changes to M&E frameworks based on on-the ground findings, is necessary. Anthropologists can fill this gap and lead to better program planning and evaluation.

### **Encouraging Interdisciplinarity**

Environmental anthropologists face a number of challenges when completing work in interdisciplinary and inter-agency situations. While interdisciplinary projects provide several unique benefits, the difficulties of such partnerships have yet to be completely outlined and/or addressed. When looking at “environmental problems,” anthropologists must engage both extra-academic policies and a number of theoretical frameworks in order to provide a well-grounded and translatable research outcome. One of the best bodies of knowledge for anthropologists working in such situations, in which the position of communities, the environment, and multi-level stakeholders merge, is that of past anthropological studies, critiques, and theoretical works. Inquiries into ecological/environmental injustice and broader environmental problems have provided an interesting and applied view on how anthropologists can work with interdisciplinary teams to provide positive outcomes. I argue that inclusion of subject-based knowledge can be combined with greater themes/theories related to interdisciplinarity in order to provide positive outcomes.



Anthropological research surrounding environmental issues engages a range of theoretical positions and draws upon a wide base of interdisciplinary knowledge. Environmental problems encompass a range of biological, physical, social, and political issues. When environmental problems translate into a need for social action, there is a need to look at both the political and the ecological aspects of a problem. Political ecology is often used in these situations, where the theory “represents an effort to make space for the forceful claims and actions of marginal communities” (Robbins 2004:190). At the same time, critiques of conservation and the literature that has grown from that broader environmental problem have also provided interesting information regarding the ways in which anthropologists can become engaged in problem-based environmental research with multiple stakeholders. Tsing et al.’s article, “Representing Communities,” is an interesting example of this, as it looks at the relationship between international organizations and interdisciplinary teams as well as the positions of local communities surrounding natural resource management (2005). Detrimental effects on communities have also been catalogued, specifically from development and tourism initiatives, and anthropologists have stepped in to look at these problems and provide holistic representations of the causes and effects of these practices (Stonich et al 1998). Neves-Graca (2006) looks at the intersection between global and local practices of environmentalism in Portugal surrounding whale hunting, outlining the clashes between conservation scientists and traditional whalers, as well as a variety of touring practices. Other problems brought to light include the difficulties with using key community representatives in international settings (Conklin and Graham 1995), and the problem of “who is speaking for whom” also resonates in Greene’s (2004) piece entitled “Indigenous People Incorporated,” here extending not only to community representatives and their voices but also the multitude of NGO’s and academics who work in “advocacy” positions related to indigenous concerns (211). Anthropologists have further infused the debate over how best to handle environmental issues by including the perspective of women’s roles within and gendered perspectives of resource use. Merchant (1980) spurred the

discussion over women and ecology through her now-controversial work “Women and Ecology.” She highlights the historical relationship of women and nature and their subservient position to men, and the thought that “nature is female.” Rochelau highlights that there are several areas of “feminist scholarship and activism on the environment” (2006:28). Schroeder (1993), Belsky (2003), and Leach (1992) all look at gender relationships within community-based contexts. Each of these areas of discussion, surrounding political ecology, conservation science, development, indigenous/community representation, and women’s positions within environmental settings is integral to address when completing environmental problem-based projects in multi-stakeholder settings. My work has sought to encourage focus on political ecological aims of power, marginalization, and levels of influence, but it has also supplemented the political ecological approach with understandings of infrastructure, appropriate technology, and assessments forwarded by engineering and marine biology in order to link social, infrastructural, and ecological outcomes.

I argue that interdisciplinary work between anthropologists and multiple stakeholders (both academic and extra-academic) has several benefits that outweigh the negative aspects of maneuvering such partnerships. Anthropologists can better situate their own work, and can anticipate areas of collaboration as well as areas of concern by engaging both anthropological theory as well as past experiences of anthropologists working in interdisciplinary groups. Our discipline is well positioned to provide the inter-agency cultural brokerage and to present community voices necessary to make lasting and positive change when addressing environmental problems. Cernea’s reform-oriented research model, wherein “anthropologists can combine their research findings with those of “hard” sciences,” is an interesting and promising way forward. We need to be concerned with how our issues are framed and to lend them added weight through interdisciplinary work (Checker 2007:121). Navigating this reality is, I argue, central to future anthropological environmental problem-based research.

Ryan Schweitzer and James Mihelcic (2012) created a sustainability analysis tool that is

a synthesis of earlier studies by Lockwood (2003), Sugden (2003), and Fragano et al. (2001), and Schweitzer's earlier research completed in Panama (2009). The approach builds on these past studies and strives to create a measure of sustainability that is well situated for rural areas and can create a standardized format for reviewing rural WatSan programs' sustainability. While cultural and social issues are of notable importance in these sustainability studies, I argue that the use of the sustainability tool could be useful for comparison but should not replace more in-depth methods. Schweitzer and Mihelcic's inclusion of PRA and cultural methods in other works (Schweitzer 2009, McConville and Mihelcic 2007), suggests that they would agree to this, and they do refer to limitations in their draft. I am confident that the type of approach used in my work will begin to fill this need.

### **Anthropology and Applications**

Anthropological contributions to WatSan M&E are called for, but the participation of anthropologists in this realm is rare. Several scholars and activists have called for anthropologists' involvement in WatSan program research either directly or implicitly<sup>147</sup>. As Lauren Fry states, "development of alternative technologies [for WatSan] will require an understanding of appropriateness and sustainability in terms of cost, effectiveness, implementation strategies, and cultural acceptability...as a result engineers should engage in partnerships with social scientists and public health professionals in the endeavor to meet sanitation needs" (2010:98). Calls for more holistic measures of sustainability (Clansen 2010: 7360, Cernea 1995), knowledge of key sub-groups and their abilities (Clansen and Carincross 2004:189), the impact of agency-implemented management paradigms (Cleaver 1998), impacts on individual agency after the placement of WatSan Systems (Cleaver and Hamada 2010:32), and further focus on "how the rules, rights, and duties attached to water are closely linked to cultural systems of meanings, symbols and values" (Boelens 2012:70) paint a picture of the

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<sup>147</sup> I use implicitly here to note that they call for areas of expertise and investigation that correspond to anthropological methods and skills.

levels of potential inclusion of anthropological approaches. Other more generally-glossed problems in WatSan program efficiency include maintenance of water quality, tensions between water use for irrigation and drinking water, and water scarcity and conservation, (especially when potable water systems are connected to water-based sewage removal infrastructure (Moe and Rheingans 2006). All of these have been either studied directly or indirectly by anthropologists (e.g. Alley 2002, Cassagrande et al. 2007, Hadley and Wutich 2009, Johnston 2012, Wutich 2009b, Wutich and Ragsdale 2008, Whiteford and Whiteford 2005). While anthropologists have made great strides, these gaps in knowledge have not yet been adequately filled with anthropological work. I am confident that my work has attended to these needs and has added to anthropological work that has begun to focus on the social side of WatSan. I hope, too, that the products I present in this chapter (checklists, policy recommendations) as well as the previous chapter (foci for political ecologists) will begin to close the gap between academic and practicing levels.

### **Contributions to Low Visibility**

If there are so many calls for cultural investigation, why are anthropologists seen so little in WatSan evaluation in applied settings (e.g. with NGOs)? Part of this, I argue, is a lack of a praxis-based approach<sup>148</sup> seen in many WatSan and M&E endeavors, where theory related to distribution does not reflect a need for cultural understanding or positioning. Michael Cernea broadens this issue by saying that “theory formation and the epistemological and methodological concerns of applied science are sporadic and wanting” (1994:84). There is a distinct need for creating theory that prizes a culturally-tuned approach on the M&E side; while frameworks such as WASH and IWRM have begun to point toward these needs, there are gaps in the frameworks and they have been ineffective in translating cultural issues to specific M&E approaches. Another part of this issue is simple; WatSan projects and programs are not meant

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<sup>148</sup> Praxis includes “knowledge, equity, and action” approaches in anthropology (Kozaitis 1999:62).

to be theory-generating but instead to fill need. Once the need is addressed with infrastructure much of the need is “met.” Anthropologists are not seen as integral to this process and are not hired with the regularity that engineers are in WatSan. However, as I have discussed here, the provision of infrastructure does not ensure its efficacy or its cultural fit. I argue that the inclusion of a praxis-based approach could be useful to WatSan program placement and to the success of development initiatives, and that this is a need that could be filled by anthropologists, especially those that employ a political ecological framework and a suite of methods to gather social data.

Another reason for the low visibility of anthropologists in WatSan issues is that even anthropologists who *are* involved in research related to WatSan infrastructure do not necessarily enter the discussion from the same point as development workers or engineers. I would argue, actually, that this difference in “entry point” is a key problem with the relatability of anthropological research. Many times, anthropologists, development professionals, and engineers may find similar issues and speak about similar problems—but the disciplinary language of anthropology can be difficult. Thomas Hylland Erikson states that “Anthropology, unlike some other academic disciplines, has yet to escape fully from the mouldy lounges and the pompous hallways of pre-war university life” (2006:26). This is partly related to the discipline’s devaluation of practice and applied anthropological work (as detailed in Hill and Baba’s edited work in 1999). Anthropologists engage with WatSan issues on a different plane than development workers, and their trademark ethnographic and observation-based methods are both highly generative and yet difficult to translate to non-anthropologists. Furthermore, anthropology’s method of direct observation is expensive and time consuming (Wutich 2009a), at least compared to short, more quantitative data gathering, and thus these methods are difficult to employ, especially for NGOs. As I argue in the next section, however, anthropological methods are very well-suited to WatSan evaluation, especially in rural areas. While anthropological involvement in M&E for WatSan-specific programs isn’t the norm,

anthropologists in the wider discipline have prescribed approaches to better address M&E concerns and have been included in M&E paradigms with success.

### **Anthropological Approaches to M&E**

Anthropologists in WatSan, Human Rights, and Development studies have begun to address the very issues that plague WatSan program M&E. Anthropologists have also begun to address monitoring and evaluation as an anthropological concern, most notably in the applied sector of the discipline. Rapid assessment techniques, critical ethnographic methods with an aim for “studying up”<sup>149</sup> in NGOs and rights issues, and theory-informed methods from development anthropology provide ways forward for M&E. Political ecological frameworks, as I have shown through my own work, are particularly appropriate. My own research works to ensure an engaged, reflexive, interdisciplinary, appropriate mixed-method approach. While more in-depth than most M&E approaches can attempt to be, I hope that the model for my study can synthesize necessary foci for individuals interested in engaging in political ecological frameworks and critiques. Even still, ways to shorten and target anthropological approaches exist and should be employed (as I did during my pilot season with rapid assessment).

Rapid assessment methods have been used, as per Harris, Jerome, and Fawcett 1997, for a variety of programs and institutions<sup>150</sup> (Taplin et al. 2002). Methods for REA include focus groups, surveys, and observation, mapping, or other qualitative methods such as pile sorts. There are several variations of Rapid Ethnographic Assessment (REA). Participatory rural appraisal (PRA), Rapid Ethnographic Assessment Procedure (REAP), and Participatory Rapid Assessment (PRA), are each iterations directly related to a field of interest (Cornwall 1995, Manderson and Aaby 1992, Scrimshaw 1987, Taplin 2002, Trotter 2001). The REA method is

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<sup>149</sup> “Studying up” focuses on studying the relationships of power between the powerful and the powerless and not just looking at the local—but rather focusing “up” toward those who create powered systems. See Laura Nader (1974) and Hugh Gusterson (1997) for more information.

<sup>150</sup> “Including programs dealing with diarrheal disease, nutrition, primary health care, acute respiratory infection, and sponsored by such agencies as United States Agency for International Development, United Nations University, United Nations International Children’s Education Fund, and the World Health Organization” (Taplin et al. 2002:81).

sometimes criticized for being less valid and less reliable than traditional ethnography. However, it is certainly a better approach than studies devoid of cultural information. While length of field research and external validity are concerns with REA (Harris et al. 1997), others argue that it has a clear place. As Bernard puts it, “The point here is that if you have a clear question and a few, clearly defined variables you can produce quality work in a lot less time than you would imagine” (Bernard 2010:265). In this, REA approaches may fill a niche where cultural information is needed but time and funding are scarce, or where information must be gained quickly (Bloom 2003). Furthermore, they are particularly suited for rural situations (especially PRA), although these methods have been criticized for the same reasons as REA in general (Cornwall and Flemming 1995).

Participatory methods<sup>151</sup> are also highly relevant in WatSan issues, especially with the trajectory of participatory methods at the IRC and, implicitly, development agencies. These methods put people first. As Richard Chambers notes, “where people are consulted, where they participate freely, where their needs and priorities are given primacy in project identification, design, implementation, and monitoring, then economic and social performance are better and development is more sustainable” (1997: 177). While I believe it is important to prize individual needs and priorities, I hesitate to make participatory methods a cornerstone of M&E methodology. Kei Otsuki warns that participatory processes in development are insufficiently understood, and suggests a “reflexivity-based” framework is needed to address these concerns, and to highlight issues with fairness and impact on everyday life (2012:208). While this is a critique of participatory development frameworks I think that it is relevant to issues of participatory research methods. Participatory methods themselves have been criticized for reinforcing the very inequalities they seek to eliminate (Kindon et al. 2008, Finniss 2004). Thus, I argue that partial use of participatory methods (e.g. in mapping) may be useful,

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<sup>151</sup> Participatory methods include applied anthropological approaches. Mapping, modeling, and community-led approaches are common (Chambers 1997). Participatory visual research (Harper 2012), have been used in environmental anthropological approaches.

but that a full participatory approach may delimit the ethnographer's eye and obscure power differences, even while also making them visible. I argue that political ecology can be key to ensuring that emic and etic concerns are balanced.

### **Translating Findings**

Anthropologists must work to “translate” their findings (and their methods) to a wider audience, including development and engineering initiatives. This translation, however—is currently not widely practiced. Some anthropological authors leave their methods out of their articles related to WatSan issues completely (e.g. Burman 2010, Wolfe and Schweitzer 1996). Thomas Hylland Eriksen states that “Anthropology should have changed the world, yet the subject is almost invisible in the public sphere outside the academy” (Eriksen 2006:1). How do we start to change the world? If anthropological findings on the topic of WatSan are meant to influence, change, or mitigate harmful effects of past WatSan policies, anthropologists must give greater attention to the readability and accessibility of their findings. Cassagrande et al. (2007) as well as Haenn and Cassagrande (2007) point toward this same need.<sup>152</sup> Not only do we need to employ the right methods, we also need to employ the right theoretical tools through which to understand and relate community-based data.

I would add to this that applied anthropologists in the *non-academic* realm must endeavor to publish their findings in academic journals in order to fuel the academy's approaches with on-the-ground information. This dual infusion of literature on WatSan issues could greatly improve both the programs/policy and the academy sides. Patrick Bixler and Peter Leigh Taylor suggest that Community-based natural resource management (CBNRM) could be informed by understandings of Open Source Software (OSS). They argue that while, for instance, watershed management personnel have “more than a century of experience and

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<sup>152</sup> Patrick Bixler and Peter Leigh Taylor suggest that anthropological approaches can be informed by the use of Open Source Software collaborations (OSS)<sup>152</sup> because of the collaborations' ability to freely share findings and knowledge (2012:241). I argue that similar OSS frameworks on both sides of the academic line could jump-start a more careful and more balanced WatSan atmosphere.



learning,” their knowledge is not being shared (2012:241). Cassagrande et al. combine the work of Gow (2002) and Sullivan (2000) to argue that “anthropologists have an ethical obligation to improve people’s lives and ensure that their research becomes integrated into policy in a manner that empowers the general public” (Cassagrande et al. 2007:126), and Haenn and Cassagrande state that anthropologists can be “translator, advocate, researcher, knowledgeable authority, coalition builder, and activist” (2007:99).

### **Policy Recommendations and Checklists**

I am aware that I do critique development and the impact of that development on the area I studied. However, I do not want to be guilty of, as Erikson puts it, “raising the public consciousness to a higher level of confusion,” which anthropologists tend to do. I do not advocate that water systems development should cease, or that the positive impacts of the systems, which are many and perceived to be great by my study sample, are not impressive and real. Without these systems, as Peter Gleick notes, people would live with “substantial, unnecessary, and preventable human suffering” (Gleick 1999:487). I have thus compiled specific water systems policy concerns and needs enumerated below, which are based on my critical findings and can be glossed as policy recommendations more broadly, that will encourage attention to political ecological aims but not unnecessarily stymie WatSan action:

1. Complete an analysis of surrounding cities’ current infrastructure for water and sanitation, ensuring that an overall, broad development design does not favor certain areas, classes, ethnicities, or populations over others, leading to large scale inequality or unequal population shift toward towns with WatSan systems available.
2. Provide checks and balances for water committee management, ensuring equal access for economic classes, ethnicities, and genders. Relatedly, design water committees such that if committees take on a larger development leadership role, they are required to gain community consent for other development decisions.
3. Consider extending water committee service time (more than two years) and incentivize participation so that specialization is possible. Continue specialization for operators, but ensure they are given proper payment, protections, and assistance.

4. Give pre-design and training attention to how water committee and operator will connect new migrants to the community, both related to growth from within the population and because of migration to the area.
5. Provide pay-per use or free community-access water stations wherein migrant, non-land-owning, or other persons without water hook-ups in their homes can access water without having to rely on neighbors or informal economic water payment systems.
6. Re-examine gendered policies of female empowerment to ensure that these endeavors do not cause harm to women or men. Including men in these approaches would be highly beneficial.
7. Address negative perceptions of wastewater, work to change attitudes and relationships with waste and incentivize save wastewater reuse practices. Incentivize voluntarism for WatSan upkeep, with extra focus on how to incentivize interaction with sanitation and wastewater treatment.
8. Begin monitoring and evaluation initiatives that take into account both perceptions of WatSan impact and the exact nature and source of that impact, mixed-method, qualitative approaches are recommended.

These recommendations and foci are further expressed in the checklists for development practitioners and communities (Tables 4 and 5).

### **Last Thoughts**

In the discipline of applied anthropology, the theory of human rights has been a call to arms for change and involvement within areas where human rights abuses are endemic or emerging in order to bolster, procure, and protect human rights. Anthropologists who work in the field of human rights are many times held up as examples of practice-oriented academics. As Peacock states, “practice includes both hands-on situations and those that we address through writing and speaking...examples include anthropologists dealing with human rights issues...” (Peacock 2000:105). This practice and activism is a tangible byproduct of the theory of human rights. Arturo Escobar argues that the discourse of the “democratic imaginary (including fulfilment of ‘needs,’ economic and social justice, human rights, class, gender and ethnic equality”) although admittedly tied to the western democratic ideals and egalitarian theory, can

Table 4: Development Practitioner Checklist

**Environmental Concerns:**

- What environmental concerns are present in the area?
- What environmental concerns are present in the community?
- Are there any NGOs or organizations in the community that may affect conservation ideas?
- Are there any communities nearby that may be affected by conservation or purchase of land?
- Are there any communities nearby that may be affected by diverting water?

**Water Use: (first ensure appropriate technology)**

- What are traditional water use practices?
- How much water do people drink?
- How many showers do people take?
- Do people use water to irrigate?
- Do people have access to a traditional (free) water source?
- What housing situations are common? Is there a practice of renting/renting rooms?
- What are perceptions of chlorination and water treatment in the area?
- Will there be a public water option?

**Sanitation Use: (first ensure appropriate technology)**

- What are traditional defecation practices?
- What is the cost of traditional latrines/sewage removal?
- Will new sewage collection facilities require a change in defecation practices or added costs(position, toilet paper, etc.)?
- Would new sewage collection facilities leave out any portion of the population?
- Will it be possible and plausible that new migrants can reasonably (meaning reasonable labor and cost) attach to the sewage collection system?
- What training do people need on how to use sewage collection facilities? (use, cleaning, etc.)
- Will there be a public sewage collection option?

**Wastewater Treatment: (first ensure appropriate technology)**

- What is the current practice for wastewater treatment?
- What are current perceptions about wastewater?
- Is any wastewater reuse currently occurring (de facto or otherwise)?
- What is the health of watershed?
- What concerns do nearby communities have about wastewater treatment?
- Are there any working models for wastewater treatment in the area?
- Do people need water for irrigation? Would they be comfortable using wastewater for irrigation?

**Operation:**

- Are there adequate volunteers for operator training?
- Are these volunteers actually capable and willing to operate the system?
- Can the WatSan project's income or base funding support at least two operators?
- Is the salary level for the operators reasonable?
- Do the operators have access to protective equipment?
- Do the operators have access to transportation?
- Do the operators have access to healthcare?
- Do the operators have adequate assistance?
- Do you see any obvious outflow of trained operators to other regions or jobs?
- If yes, how can the WatSan system ensure retention?

**WatSan Management:**

- How will the committee be elected?
- Will the process exclude people who rent homes?
- Will the process exclude people who are young, old, or who have other members of their family that would be elected in their place?
- Are gender inclusion policies potentially a problem socially for women or men?
- How much "free time" do people have during the week?
- If migration is expected or possible, how will migrants be included in the WatSan process?
- Is the cost of connecting to the system, if days of work cannot be used for payment, difficult or impossible to pay for new migrants?
- What ethnic divisions exist in the community, if any?
- For how long will people serve on the water committee?
- Is a committee truly the right choice for this community, or could an organization be put in charge of the water management (with long-term members?)

Table 5: Community Member Checklist

**Environmental Concerns:**

What environmental concerns are present in the area?

What environmental concerns are present in the community?

Do you own the land where the water comes from?

Could you stop harm to the environment in any way?

**Water Use**

Do people have enough water to drink?

Do people have enough water to perform household tasks?

Do renters have specific rules and regulations that ensure their water use is equitable?

What are perceptions of chlorination and water treatment in the area?

Will there be a public water option?

Does the school practice water treatment to ensure that the water is safe to drink for children?

Do new migrants to the area have a way to get water before their dwelling is connected?

**Sanitation Use: (first ensure appropriate technology)**

Does everyone have access to adequate sanitation?

Is there a public toilet?

What training do people need on how to use sewage collection facilities? (use, cleaning, etc.)

Is there a problem with cleanliness for toilets?

Is there a problem with toilet paper use?

**Wastewater Treatment: (first ensure appropriate technology)**

Does everyone know that the wastewater treatment system exists?

Can you incentivize people helping with the wastewater treatment system?

How do community members want to try to start wastewater reuse?

**Operation:**

Are there adequate volunteers for operator training?

Are these volunteers actually capable and willing to operate the system?

Can the WatSan project's income or base funding support at least two operators?

Is the salary level for the operators reasonable?

Do the operators have access to protective equipment?

Do the operators have access to transportation?

Do you see any obvious outflow of trained operators to other regions or jobs?

How can community members support the operator?

**WatSan Management:**

How will the committee be elected?

Will the process exclude people who rent homes?

Will the process exclude people who are young, old, or who have other members of their family that would be elected in their place?

Are gender inclusion policies potentially a problem socially for women or men?

How much "free time" do people have during the week?

If migration is expected or possible, how will migrants be included in the WatSan process?

For how long will people serve on the water committee?

work beyond the western framework. He states that "this discourse offers the possibility of material and institutional gains and the emergence of a more pluralistic society" (2005:349).

This, certainly, is a key aspect of the thoughts of justice, rights, and equality. It is also encouraging for the applied scholar, and the applied WatSan scholar, more specifically.

Ethnography is uniquely suited to addressing these concerns in WatSan, and as I have shown through this dissertation, anthropological theories are well-situated to provide conceptual frameworks for eliciting these concerns. Linking these strengths with the ongoing technological experience and abilities of engineers is tantamount to reasonable and effective WatSan development. As Mihelcic et al. note, “although [environmental engineering] knowledge and technology have greatly improved public health in developed nations, much of the developing world still experiences public health crises that could be significantly mitigated by engineering” [2009:3]. I would add to this that the placement of these engineering technologies should be linked with an anthropological eye and aided by the use of a political ecological approach, as was employed in my work.

Water is life. That is a sentiment and a fact that is rarely contested. Ensuring the appropriate provision of water, and making it safe and accessible for all, is a clear and admirable goal for the international community. The other side -- waste is life -- is less obvious. Ensuring that water *and* sanitation goals are forwarded will continue to be a difficult task for all WatSan practitioners. The inclusion of sanitation infrastructure, and all that goes with it is central to the viability of water systems and the usefulness of WatSan development in general. I agree with Mihelcic et al. that, “whereas feces, urine, and greywater are often seen as wastes that require collection and treatment, they should instead be viewed as a resource” (2009:379). Ensuring equality and inclusion, appropriateness of infrastructure, and continual re-evaluation of cultural and social concerns in a multitude of global locations is a great undertaking. Encouraging the wider WatSan community to consider the intricacies and potential mis-steps of both water and sanitation development in an effort to encourage reasonable and culturally-appropriate relationships and solutions in WatSan provision is a clear and necessary way forward for anthropologists and the practice of WatSan more broadly.

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**APPENDIX A:**  
**INTERVIEW SCRIPT DEVELOPMENT PROFESSIONALS**

**Part A: Descriptives**

- For what organization do you work?
- What is your position in your Agency?
- How many years have you worked in development?
- What is your first language?
- What language do you speak day-to-day?
- What is your ethnicity and nationality?
- What is your age and gender?
- What are the main locations in which you work?

**Part B: General Development**

- What are the greatest development needs in Bolivia?
- What are the greatest barriers to development in Bolivia?
- In what ways has the landscape and territory of Bolivia changed because of international development?

**Part C: Logistics**

- How does your organization choose projects? Probes: What projects are relevant now? Locations? Beneficiaries? Partner organizations?
- What role do local persons play in your projects? Probes: Are there local funders? Participants? Organizers? Employees?
- Are your projects based on satisfying a declared human right?
- What rights frameworks does your organization use, if any?
- What rights frameworks are common in Bolivia? Do you use any of these in your work?

Are Bolivian individuals interested in UN-based human rights? Are they aware of the international discussion? What are some common opinions held regarding the idea?

#### **Part D: Yungas**

Have you worked in the Yungas region? What are some of the issues on the ground in that area?

What is the position of women in Yungas?

What is the position of minorities/ethnic groups in Yungas?

Is there economic stratification in Yungas (differences between the position of poor and rich)?

In your opinion, are individuals in the area aware of the UN-based human rights framework? If so, how do they use it (if at all)? If not, how do they conceptualize rights?

How do local issues affect development efforts?

Do the goals of development initiatives ever clash with local needs/wants?

#### **Part E: Water and Sanitation**

Is water and sanitation a priority for Bolivia? Your organization?

Do you believe that water and sanitation a human right?

Do you feel that Bolivians have both water and sanitation this time?

If a person has a right to drinking water and sanitation, who is responsible for providing this?

If there is a failure in making this right a possibility, who is required to fill that need?

If local governments are not able to provide water and sanitation infrastructure, is it the responsibility of the U.S. or other international organizations to provide that infrastructure?

If foreign organizations did not provide infrastructure, do you believe that the local government would make an effort to satisfy these needs?

Are there issues with making water and sanitation a right for all in Bolivia? If so, what are the problems? Do you have experience with this in your work? Examples?

Do you think that treatment of wastewater is equally important as distribution of potable water?

What are some specific barriers for sanitation work?

What do you think the perceptions of the public are to wastewater water treatment vs. potable water?

Do you think that potable water systems should include wastewater treatment systems?

Do you think that wastewater treatment systems are as sustainable as potable water?

Do you think that some wastewater treatment technologies are better than others? Ponds?  
Reactors?

Do you think that individuals in Bolivia are okay with reusing treated wastewater for agriculture?

Do you think that allowing the wastewater effluent to go into rivers will have negative impacts?

#### **Part F: Program-Based**

Do you think that WatSan programs ever reinforce pre-existing inequalities (such as gender or other inequalities)?

Do you think that water and sanitation programs are sustainable? If not, what are some solutions you may recommend?

Do you think that the water committee structure is sustainable?

Bolivia recently gave rights to Mother Nature. Do you think that water and sanitation development endangers natural resources/natural landscapes?

#### **Part G: Closing**

Any further comments?

Is there anything you wish I had asked that I did not?

**APPENDIX B:**  
**INTERVIEW SCRIPT COMMUNITY MEMBERS**

**Demographics:**

What language do you speak most often?

What is your ethnicity?

What is your age?

What is your gender?

**Part A: Setting**

Can you describe a typical day for you in Sapecho?

How does your household sustain itself?

What is a man's role in society in Sapecho?

What is a woman's role in society in Sapecho?

**Part B: Ideas of Rights**

Are you familiar with the idea of human rights?

If so, what do you think of human rights?

What human rights do you possess?

Are you familiar with the idea of indigenous rights?

If so, what do you think of indigenous rights?

Are you familiar with women's rights movements?

If so, what do you think women's rights are?

What rights are most important to you?

Do you think mother nature has rights?

If so, how do we ensure that nature has rights? Barriers to this?

Who do you think is responsible for ensuring all individuals have rights?

If rights are not upheld within a certain area, who should be responsible for making sure that these needs are met?

### **Part C: Human Rights and Water:**

Do you feel that potable water is a human right?

Do you feel that sanitation is a human right?

Who is most responsible for managing water systems in the area?

Who do you think should be responsible for water systems in the area?

Who do you think should be responsible for general development in the area?

Do you feel that development agencies help to guarantee human rights?

Do you have a voice in development agencies' decisions?

Do you feel that the right to water and sanitation is important?

Of the two, potable water and sanitation, which do you think is most important for you?

What other rights are important to you?

### **Part D: General efficacy of Water Systems:**

Do you get enough water from the water system? If not, how do you handle your water needs?

Probe: % of need?

Is the water system equitably designed? If not, who is left out and why?

Do you feel that the water system has changed your life? How?

Do you feel that the water committee is effective at running this water system? If not, where are some areas that they could improve?

What are the barriers to the system working (if any)?

### **Part E: Wastewater Treatment**

What do you think of the wastewater treatment system?

What do you think of the reactor? Is it better or worse than the treatment ponds?

What happens to your wastewater after you use it? (black water)

Do you ever reuse grey water or black water? How?

Would you rather the treated wastewater go into the river (impact fishing) or be used for agriculture? Why?

Do you think that the wastewater treatment system is as sustainable as the potable water system? Why or why not?

**Part F: Use of Water**

What do you use the water from the water system for?

How much water do you drink every day?

How often do you boil the water that you drink?

Do you wash your clothes using potable water?

Do you use the water system for agriculture? If so, how does that work?

**Part G: Change to Local Landscape**

Has the local landscape changed because of the water system? If so, how?

What are the effects on the environment because of the system?

Have there been detrimental effects?

**Part H: Closing**

Any further comments?

Is there anything that you wish I had asked that I did not?

**APPENDIX C:**  
**FOCUS GROUP SCRIPT WITH WATER COMMITTEE**

Number of individuals in Focus Group

Ages

Ethnicities

Genders

**Part A: Scope of Water System**

How many homes are connected to the water system?

How many individuals are part of the water committee?

What are the geographical limits of the water system?

Have these changed since last year?

**Part B: Efficacy of Water System/Water Committee**

How often does the water system work?

Are there seasonal differences in water system efficacy?

Who is responsible for keeping up the water system?

How many times have you needed outside help to fix the water system?

What are the problems with the water system (if any)?

What are the problems with the water committee model (if any)?

Have you needed outside help with the water system lately? What for?

**Part C: Water Committee Payment Questions**

Are water committee members volunteers?

If not, how much are water committee members paid? (local currency / per month)

#### **Part D: Water System Payment Questions**

How much does the water system cost individuals who are connected?

Individuals who are not connected?

Do you feel the fee is worth what individuals pay?

Who collects the money for the water system?

Do you use an accounting book to record payments?

Have individuals ever been disconnected for financial reasons?

#### **Part E: Water System Equity**

Do you feel that the water system is equitably distributed?

Do you feel that indigenous or other groups are underrepresented in water system connectivity?

If so, which groups?

Do you feel that the water committee is equitably representative of all groups?

If not, which groups are not represented?

Are women equally a part of water system management?

#### **Part F: Development Responsibility**

Do you feel that access to water and sanitation is a human right?

Who do you think should be responsible for water systems in the area?

Who do you think should be responsible for general development in the area (if wanted)?

What development projects are needed in the area (if applicable)?

Do you think that treatment of waste water is equally important as distribution of potable water?

#### **Part G: Expectations of Development**

Do you know how development agencies choose projects?

Do you know why development agencies chose to put in a water system?

Do you feel that the water system will work long-term?

#### **Part H: Human Rights Context**

Are you familiar with the idea of human rights? The United Nations?



Do you feel that the water system and treatment system has improved your rights?

Are you familiar with indigenous rights? Do you use that discourse?

Are you familiar with the bill of rights for mother nature? Do you feel that the water system respects nature?

Do you feel that development agencies work from a rights framework? If so, what rights do they uphold? Have you ever heard development professionals talk about rights?

Has working with the development agency been beneficial for you?

### **Part I: Wastewater Treatment**

What do you think the perceptions of the public are to wastewater treatment vs. potable water systems?

Do you think that potable water systems should include wastewater treatment systems? Why or why not?

Do you think that wastewater treatment systems are as sustainable as potable water? Why or why not?

Do you think that some wastewater treatment technologies are better than others? Ponds? Reactors?

Do you think that individuals in the town are okay with reusing treated wastewater for agriculture?

Do you think that allowing the wastewater effluent/output to go into rivers will have negative impacts?

Do individuals ever reuse grey water (or black water)?

### **Part J: Local Landscape**

Has the local landscape changed because of the water system? If so, how?

Are there any detrimental effects on the environment because of the system? Benefits to the environment?

### **Part K: Closing**

Any further comments?

Is there anything that you wish I had asked that I did not?

**APPENDIX D:**  
**WATER MAPPING PROMPT**

**Water Mapping**

This activity is to assess the different ways in which people in the community access water. In order to gain an idea of water use, I ask that you draw a map of your water use. Please map the places you got water before the potable water system, at the present, and where you expect to get water in the future. This map is also used to ask how you use water. For instance, think about where you used to wash clothes and if that has changed. Do you now have a latrine? Where did your dirty water go before the water treatment system? Do you think the system will work in the future? If not, where do you think your water will come from? Where do you get the water to feed your crops? What are areas of cultural importance for you as a community member related to water?

You will have three sheets of paper to complete the map. The person with you may take notes of what you describe as you map. There is no “right” or “wrong” way to draw the map. You do not have to be an artist! I just want to learn from you through your mapping of your community’s relationship with water. Thank you so much for your participation.

You will have three sheets of paper. If you would like more paper, extra sheets will be provided for you. This activity should take approximately 20 minutes.

**APPENDIX E:**  
**INFORMED CONSENT SCRIPTS**

**English/Spanish Survey and Mapping**

This is a research study conducted by a Doctoral Student from University of South Florida. The IRB # for this survey is Pro 00004366. The purpose of the study is to collect information from community members regarding the effect and efficacy of the water systems in this area. The PI for this study is Maryann Cairns. You may contact her at [mcairns@mail.usf.edu](mailto:mcairns@mail.usf.edu). We will provide you with additional pertinent information after this study as needed. You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study. This research consists of a systematic sample survey. You are being asked to complete a survey. An enumerator will be asking you questions regarding your perceptions of the water system efficacy and impact. No personal identifying information will be collected by this study. Data from this study will be kept by the PI for minimum of five years after the project is completed. There are no foreseeable risks in this study. There are no benefits in this study. If you prefer to ask questions of the IRB board, if the research staff cannot be reached, or if you have questions or complaints about this research, please contact the IRB at USF at (813)-974-5638.

Este es un estudio de investigación conducido por un estudiante de doctorado de la Universidad del Sur de la Florida (University of South Florida). El número de junta de revisión institucional (IRB) de esta encuesta es Pro 00004366. El propósito de este estudio es recolectar información de miembros de la comunidad acerca de los efectos y la eficacia de los sistemas de agua en esta área. La investigadora principal de este estudio es Maryann Cairns. Pueden comunicarse con ella a través de su correo electrónico [mcairns@mail.usf.edu](mailto:mcairns@mail.usf.edu). Le daremos información adicional pertinente después de este estudio, según sea necesario. Usted sólo debería tomar parte en este estudio si desea hacerlo de manera voluntaria. Usted no debe sentirse presionado a tomar parte en este estudio. Usted es libre de participar o retirarse de esta investigación en cualquier momento. No va a ver ninguna sanción/multa o pérdida de beneficios a los cuales tiene derecho si usted deja de participar en esta investigación. Esta investigación consiste en un ejemplo de encuesta sistemático. Se le va a pedir que complete una encuesta. Un enumerador estará haciéndole preguntas acerca de su percepción de la eficacia del sistema de agua y su impacto. Ninguna información de identificación personal será recolectada para este estudio. Los datos de este estudio serán guardados por el investigador principal por un tiempo mínimo de cinco años después finalizar el proyecto. No hay riesgos previsible en este estudio. No hay beneficios en este estudio. Si prefiere hacer preguntas a la junta de revisión institucional (IRB), si el personal de investigación no puede ser contactado, o si tiene preguntas o quejas sobre esta investigación, por favor póngase en contacto con el IRB de USF al [\(813\)-974-5638](tel:813-974-5638).

## English/Spanish Interviews

This is a research study conducted by a Doctoral Student from University of South Florida. The IRB # for this survey is Pro 00004366. The purpose of the study is to collect information from community members regarding the effect and efficacy of the water systems in this area. The PI for this study is Maryann Cairns. You may contact her at [mcairns@mail.usf.edu](mailto:mcairns@mail.usf.edu). We will provide you with additional pertinent information after this study as needed. You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study.

This research consists of semi-structured interviews of key informants. You are being asked to participate in an interview because of your particular knowledge, as a community member, of water systems and/or community management of water systems. There will also be questions concerning daily routines and practices surrounding water. After the survey, the enumerator will ask you to complete a mapping exercise related to water in the area. Audio recording will be used for the benefit of the researcher. Please do not state any identifying information during the recording. The researchers will not disclose your names or any identifying information about you. Your information will not be shared and pseudonyms will be used in the write-up of this data. Data from this study will be kept by the PI for minimum of five years after the project is completed. There are no foreseeable risks in this study. There are no benefits in this study. If you prefer to ask questions of the IRB board, if the research staff cannot be reached, or if you have questions or complaints about this research, please contact the IRB at USF at (813)-974-5638.

Este es un estudio de investigación conducido por un estudiante de doctorado de la Universidad del Sur de la Florida (University of South Florida). El número de junta de revisión institucional (IRB) de esta encuesta es Pro 00004366. El propósito de este estudio es recolectar información de miembros de la comunidad acerca de los efectos y la eficacia de los sistemas de agua en esta área. La investigadora principal de este estudio es Maryann Cairns. Pueden comunicarse con ella a través de su correo electrónico [mcairns@mail.usf.edu](mailto:mcairns@mail.usf.edu). Le daremos información adicional pertinente después de este estudio, según sea necesario. Usted sólo debería tomar parte en este estudio si su desea hacerlo de manera voluntaria. Usted no debe sentirse presionado a tomar parte en este estudio. Usted es libre de participar o retirarse de esta investigación en cualquier momento. No va a ver ninguna sanción/multa o pérdida de beneficios a los cuales tiene derecho si usted deja de participar en esta investigación.”

Esta investigación consiste de entrevistas semi-estructuradas a informantes claves. Se le ha pedido ser parte de esta investigación debido a su conocimiento, como miembro de la comunidad, de los sistemas de agua y/o manejo comunal de los sistemas de agua. También habrá preguntas sobre las rutinas diarias y prácticas relacionadas con el agua. Después de la encuesta, el encuestador le pedirá que complete un ejercicio de mapeo (dibujar un mapa) relacionado con el agua en la zona. La grabación de audio de utilizara para beneficio del investigador. Por favor no declare ninguna información que lo identifique durante la grabación. Los investigadores no revelarán su nombre o ninguna información de identificación sobre usted (que lo identifique). Su información no será compartida y seudónimos se utilizarán en el reportaje de estos datos. Los datos de este estudio serán guardados por el

investigador principal por un tiempo mínimo de cinco años después finalizar el proyecto. No hay riesgos previsibles en este estudio. No hay beneficios en este estudio. Si prefiere hacer preguntas a la junta de revisión institucional (IRB), si el personal de investigación no puede ser contactado, o si tiene preguntas o quejas sobre esta investigación, por favor póngase en contacto con el IRB de USF al [\(813\)-974-5638](tel:813-974-5638)

## English/Spanish Focus Group

This is a research study conducted by a Doctoral Student from University of South Florida. The IRB # for this survey is Pro 00004366. The purpose of the study is to collect information from community members regarding the effect and efficacy of the water systems in this area. The PI for this study is Maryann Cairns. You may contact her at [mcairns@mail.usf.edu](mailto:mcairns@mail.usf.edu). We will provide you with additional pertinent information after this study as needed. You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study.

This research consists of a semi-structured focus group with water committee members. You are being asked to participate in this focus group because of your position on the water committee. Audio recording will be used for the benefit of the researcher. Please do not state any identifying information during the recording. The researchers will not disclose your names or any identifying information about you. Your information will not be shared and pseudonyms will be used in the write-up of this data. Data from this study will be kept by the PI for minimum of five years after the project is completed. There are no foreseeable risks in this study. There are no benefits in this study. If you prefer to ask questions of the IRB board, if the research staff cannot be reached, or if you have questions or complaints about this research, please contact the IRB at USF at (813)-974-5638.

Este es un estudio de investigación conducido por un estudiante de doctorado de la Universidad del Sur de la Florida (University of South Florida). El número de junta de revisión institucional (IRB) de esta encuesta es Pro 00004366. El propósito de este estudio es recolectar información de miembros de la comunidad acerca de los efectos y la eficacia de los sistemas de agua en esta área. La investigadora principal de este estudio es Maryann Cairns. Pueden comunicarse con ella a través de su correo electrónico [mcairns@mail.usf.edu](mailto:mcairns@mail.usf.edu). Le daremos información adicional pertinente después de este estudio, según sea necesario. Usted sólo debería tomar parte en este estudio si su intención es hacerlo de manera voluntaria. Usted no debe sentirse presionado a tomar parte en este estudio. Usted es libre de participar o retirarse de esta investigación en cualquier momento. No va a ver ninguna sanción/multa o pérdida de beneficios a los cuales tiene derecho si usted deja de participar en esta investigación.

Esta investigación consiste de un grupo de enfoque semi-estructurado con miembros del comité del agua. Se le ha pedido participar en este grupo de enfoque por su posición en el comité de agua. La grabación de audio de utilizara para beneficio del investigador. Por favor no declare ninguna información que lo identifique durante la grabación. Los investigadores no revelarán su nombre o ninguna información de identificación sobre usted (que lo identifique). Su información no será compartida y seudónimos se utilizarán en el reportaje de estos datos. Los datos de este estudio serán guardados por el investigador principal por un tiempo mínimo de cinco años después finalizar el proyecto. No hay riesgos previsibles en este estudio. No hay beneficios en este estudio. Si prefiere hacer preguntas a la junta de revisión institucional (IRB), si el personal de investigación no puede ser contactado, o si tiene preguntas o quejas sobre esta investigación, por favor póngase en contacto con el IRB de USF al [\(813\)-974-5638](tel:813-974-5638).

## English/Spanish Interviews for Development Workers

This is a research study conducted by a Doctoral Student from University of South Florida. The IRB # for this survey is Pro 00004366. The purpose of the study is to collect information from international development professionals related to development projects in the Yungas region and/or water and sanitation projects in Bolivia. The PI for this study is Maryann Cairns. You may contact her at [mcairns@mail.usf.edu](mailto:mcairns@mail.usf.edu). We will provide you with additional pertinent information after this study as needed. You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study.

This research consists of semi-structured interviews of key informants. You are being asked to participate in an interview because of your particular knowledge of water systems and/or community management of water systems. Audio recording will be used for the benefit of the researcher. Please do not state any identifying information during the recording. The researchers will not disclose your names or any identifying information about you. Your information will not be shared and pseudonyms will be used in the write-up of this data. Data from this study will be kept by the PI for minimum of five years after the project is completed. There are no foreseeable risks in this study. There are no benefits in this study. If you prefer to ask questions of the IRB board, if the research staff cannot be reached, or if you have questions or complaints about this research, please contact the IRB at USF at (813)-974-5638.

Este es un estudio de investigación conducido por un estudiante de doctorado de la Universidad del Sur de la Florida (University of South Florida). El propósito de este estudio de recolectar información de profesionales de desarrollo internacionales relacionados con proyectos de desarrollo en la región de las Yungas y /o proyectos de agua y servicios sanitarios en Bolivia. La investigadora principal de este estudio es Maryann Cairns. Pueden comunicarse con ella a través de su correo electrónico [mcairns@mail.usf.edu](mailto:mcairns@mail.usf.edu). Le daremos información adicional pertinente después de este estudio, según sea necesario. Usted sólo debería tomar parte en este estudio si su intención es ser voluntario. Usted no debe sentirse presionado a tomar parte en este estudio. Usted es libre de participar o retirarse de esta investigación en cualquier momento. No va a ver ninguna sanción/multa o pérdida de beneficios a los cuales tiene derecho si usted deja de participar en esta investigación.

Esta investigación consiste de entrevistas semi-estructuradas a informantes claves. Se le ha pedido ser parte de esta investigación debido a su conocimiento de los sistemas de agua y/o manejo comunal de los sistemas de agua. La grabación de audio de utilizara para beneficio del investigador. Por favor no declare ninguna información que lo identifique durante la grabación. Los investigadores no revelaran su nombre o ninguna información de identificación sobre usted (que lo identifique). Su información no será compartida y seudónimos se utilizarán en el reportaje de estos datos. Los datos de este estudio serán guardados por el investigador principal por un tiempo mínimo de cinco años después finalizar el proyecto. No hay riesgos previsibles en este estudio. No hay beneficios en este estudio. Si prefiere hacer preguntas a la junta de revisión institucional (IRB), si el personal de investigación no puede ser contactado, o si tiene preguntas o quejas sobre esta investigación, por favor póngase en contacto con el IRB de USF al (813)-974-5638

**APPENDIX F:  
LETTERS OF SUPPORT**





US Business Office  
329 Wilson Ct  
Huntington, WV 25701 USA  
510-931-7625  
aqssolutions.org  
info@aqssolutions.org

September 1, 2009

Dr. Jessica Robin  
Office of International Science & Engineering  
National Science Foundation

Dear Dr. Robin:

I would like to express my support for continuing the sustainable development research program situated in Bolivia that is supported by NSF's International Research Experiences for Students program and is directed by Dr. Mihelcic.

In the last three years I have assisted Dr. Mihelcic and his students in many activities. I spend the spring semester organizing the field logistics for research projects of the different U.S. doctoral students. I also help to train the Bolivia engineering students in research field methods and some specifics of water and sanitation before their departure and serve on the Bolivian student selection committee with faculty from Universidad Tecnológica Boliviana. In the summer I travel to the research site with Dr. Mihelcic and the students where I coordinate the engagement of research group and the many communities we work in. In that capacity, I assist Dr. Mihelcic in obtaining services needed to complete the research from various non-governmental and governmental organizations in the area. I also have advised several of the doctoral students on their research and they have included me as a co-author in some of their publications.

This research project has had meaningful impact on the U.S. and Bolivian students and on lives of members of the communities that we work in. I have observed how students have continued their professional relationships and have been proud to see many of the U.S. students continue with additional international education or research experiences. If Professors Mihelcic and Phillips are awarded an IRES grant to continue this research experience in Bolivia, I will continue in my capacity to assist him in defining and completing transformational research in Bolivia.

Sincerely,

Nathan Reents  
Environmental Engineer  
Aqueous Solutions



Department of Civil and  
Environmental Engineering  
Environmental & Water Resources Engineering (EWRE)  
4202 E. Fowler Avenue, ENB 118  
Tampa, FL 33620

**James R. Mihelcic**

*phone: 813-974-9896*  
*facsimile: 813-974-2957*  
*email: jm41@eng.usf.edu*

May 7, 2011

The purpose of this letter is to supplement the letter written by Mr. Nathan Reents from Aqueous Solutions. Mr. Reents is a local partner who assists our research group in obtaining access to local community members. Mr. Reents has worked in the communities Ms. Cairns is proposing to perform her research in and is able to obtain our research group with access to individual community members and the water committees that oversee operation and maintenance of water and sanitation systems. We have permission to conduct the research at the Bolivia research site. I have reviewed the research proposed by Ms. Cairns and found it appropriate for the communities at our field site. There are also facilities available for Ms. Cairns to conduct the research in an IRB approved manner and if any unanticipated problems occur, Mr. Reents and I will work with Ms. Cairns to provide solutions.

Sincerely,

A handwritten signature in cursive script that reads "James R. Mihelcic".

James R. Mihelcic, Ph.D.  
Professor  
Civil and Environmental Engineering  
State of Florida 21st Century World Class Scholar  
Director, Master's International Program in Civil & Environmental Engineering

La Paz, 28 de agosto 2009  
CITE: UTB-RECT- No. 51

**Jessica Robin**  
**Office of International Science and Engineering**  
**National Science Foundation**  
Presente

Dear Jessica:

The Universidad Tecnológica Boliviana (La Paz) is very enthusiastic to support a 3-year continuation of the U.S. National Science Foundation proposal "Integration of International Research Experience in Bolivia with Sustainable Development Engineering Education and Research". In the past 3 years, twenty of our engineering students have partnered with U.S. students from three universities under the directorship of Dr. James R. Mihelcic.

As the program partner, UTB will continue to identify student participants, provide technological pre-training coursework to students who participate, continue to integrate this program into the students' spreading the results of the above mentioned works in the university community course of study, and allow by Director of Research, to continue to serve as a research advisor. Unique to this research program is that the findings assist local communities in sustainable development.

Now that Dr. Mihelcic has moved to the University of South Florida, we are interested in further developing this important relationship to expand opportunities for our students and faculty members.

Sincerely,

  
**Lic. V. Kenny La Fuente Camacho**  
**RECTOR**  
Universidad Tecnológica Boliviana

c.c.: Arch.  
VKLF:caj.

**APPENDIX G:**  
**IRB APPROVAL LETTER**



DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE  
 Institutional Review Boards, FWA No. 00001669  
 12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799  
 (813) 974-5638 • FAX (813) 974-5618

6/1/2011

Maryann Cairns  
 Anthropology  
 3002 W. Sities St. Apt. D

RE: **Expedited Approval** for Initial Review  
 IRB#: Pro00004366  
 Title: Community Perceptions and Community Impact: An Assessment of Water Systems  
 In Rural Bolivia

Dear Maryann Cairns:

On 6/1/2011 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol. Please note that your approval for this study will expire on 6/1/2012.

Approved Items:

Protocol Document(s):

<a href="#">IRB Protocol M. Cairns Bolivia. with revisions.3.docx</a>	5/21/2011 10:13 AM	0.01
-----------------------------------------------------------------------	--------------------	------

**Consent/Assent Documents:**

Name	Modified	Version
<a href="#">Information Scripts English and Spanish for IRB.docx.pdf</a>	6/1/2011 2:30 PM	0.01

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review categories:

- (6) Collection of data from voice, video, digital, or image recordings made for research purposes.
  - (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.
-

Please note, the informed consent/assent documents are valid during the period indicated by the official, IRB-Approval stamp located on the form. Valid consent must be documented on a copy of the most recently IRB-approved consent form.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

A handwritten signature in cursive script that reads "John A. Schinka, Ph.D.".

John Schinka, Ph.D., Chairperson  
USF Institutional Review Board

Cc: Olivia Hart  
USF IRB Professional Staff