

Mutual Aid as Community Development:
Accessing Potable Water in Rural El Salvador

By
Sande Ewart

A Thesis Submitted to
Saint Mary's University, Halifax, Nova Scotia
in Partial Fulfillment of the Requirements for
the Degree of International Development Studies.

April, 2008, Halifax, Nova Scotia

Copyright Sande Ewart, 2008

Approved: Dr. Anthony O'Malley.
Supervisor

Approved: Dr. Edwin MacLellan
First Reader

Approved: Dr. Cathy Conrad,
External

Date: 16 April 2008



Library and
Archives Canada

Bibliothèque et
Archives Canada

Published Heritage
Branch

Direction du
Patrimoine de l'édition

395 Wellington Street
Ottawa ON K1A 0N4
Canada

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

ISBN: 978-0-494-41694-5

Our file Notre référence

ISBN: 978-0-494-41694-5

NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.

Mutual Aid as Community Development:
Accessing Potable Water in Rural El Salvador

by Sande Ewart

Abstract

This study looks at the potable water problematic in the rural Salvadoran community of Delicias in the department of Cuscatlán. It proposes a new approach to community management of a common-property resource (CPR) like potable water by focusing on the cooperative aspects of human nature hardwired into us by natural selection. This cooperative instinct was initially referred to as Mutual Aid by Russian evolutionists, and was introduced to the English speaking world by Peter Kropotkin in the late-nineteenth and early twentieth century. Although the Western obsession with practicality competition and conflict in the sciences and social sciences, known as the “English doctrine”, has resulted in a serious neglect of this cooperative evolutionary perspectives, in recent years scientists have begun to re-evaluate the value of cooperation in the evolutionary process. In this study we will look at how this re-emerging area of study can inform community development thinking and practice.

30 April 2008

Abbreviations:

ADESCO	Asociaciones de Desarrollo Comunal (Communal Development Associations)
ANDA	Administración Nacional de Acueductos y Alcantarillados (National Administration for Aqueducts and Sewage Systems)
ANDAR	Asociación Nacional para la Defensa, Desarrollo y Distribución de Agua a Nivel Rural (National Association for the Defense, Development and Distribution of Water at the Rural Level)
CDC	Centro para la Defensa del Consumidor (Center for Defence of the Consumer)
CEAA	Comision Especial de Abastecimiento de Agua (Special Comission for the Supply of Water)
CEL	La Comisión Ejecutiva del Río Lempa (Lempa River Executive Commission)
CEPAL	Economic Commission on Latin America and the Caribbean Latin America
CESTA	Centro Salvadoreño de Tecnología Apropriada
CIDA	Canadian International Development Agency
CREA	Creative Associates International
FIS-DL	Fondo de Inversión Social para el Desarrollo Local (Social Investment Fund for Local Development)
FUSADES	Fundación Salvadoreña para el Desarrollo Economico y Social (Salvadoran Foundation for Economic and Social Development)
IA 2015	Iniciativa Agua 2015 (Water Initiative 2015)
IDB	Inter-American Development Bank
IDRC	International Development Research Centre
LANIC	Latin American Network Information Center
MAG	Ministerio de Agricultura (Ministry of Agriculture)
MDG	Millennium Development Goal
MARN	Ministerio de Medio Ambiente y Recursos Naturales (Ministry of the Environment and Natural Resources)
MSPAS	Ministerio de Salud Publica y Asistencia Social (Ministry of Public Health and Social Assistance)
NGO	Non-governmental organization
PAHO	Pan-American Health Organization
PCI	Project Concern International
PLANSABAR	Plan de Saneamiento Básico Rural (Rural Sanitation Plan)
PRISMA	Programa Salvadoreño de Investigación Sobre Desarrollo y Medio Ambiente (Salvadoran Program for the Study of Development and the Environment)
RAS-ES	Red de Agua y Saneamiento de El Salvador (Water and Sanitation Network of El Salvador)
UNDP	United Nations Development Program
UNES	Unidad Ecológica Salvadoreña (Salvadoran Ecological Unit)
USAID	United States Agency for International Development
WHO	World Health Organization

Chapter 1—Introduction

I

As a new millennium begins, as many as 1.1 billion people in developing countries do not have access to safe drinking water. Sanitation is in an even greater state of disarray, with approximately 2.6 billion lacking basic sanitation services (UNDP, 2006a: 2). “Many city dwellers throughout the world” writes Ann-Christin Sjölander Holland (2005) “lack even rudimentary toilet facilities. They have to defecate in open spaces or into waste paper or plastic bags” (p.12). While Fredrik Segerfeldt (2005) claims that these figures have remained constant for decades, it has been predicted by other water resource experts that by the middle of this century the number of people in the world living without an adequate supply of fresh water could reach 4 billion (Black, 2004: 24). Furthermore, diseases resulting from poor water supply and quality tremendously impede the development of many countries in the South.

It is difficult to assess the exact toll the lack of access to safe drinking water takes on human lives, but according to Godfrey (2005), there were more than 2 billion water related cases of diarrhoea, leading to some 2.2 million deaths in the year 2000 alone (p.2). UN-Habitat (2003) describes the world's water plight in much grimmer terms, arguing

that in 2003, it is probable that more people died because of a lack of clean drinking water than died as a result of armed conflict (p.58). The World Bank (2002) also shares UN-Habitat's view claiming that as many as 3 million children alone die every year from water-borne diseases, that is, roughly one child every ten seconds. Although governments around the world are well aware of this looming crisis, the steps being taken to remedy the situation appear far from adequate to resolve the problem.

Next to oxygen, potable water is the most vital element to human existence, and without it practically nothing on this planet can survive. Human beings consist of roughly 60 to 70 percent water and can survive for only a few days without it. We become thirsty when we lose as little as one percent of our body fluid and our very lives become endangered if we lose just ten percent (Segefeldt, 2005: 7). Water is needed for almost every human activity, most importantly for consumption. But it is also needed for domestic activities like cooking, cleaning and sanitation, as well as such economic generating activities as agriculture, industry and the generation of hydro-electricity. Clean water is an essential part of life and if human beings do not possess it in a clean and sufficient enough supply, it will take a tremendous toll on our quality of life. Water is a basic and fundamental necessity and thus, stands front and center in the development debate.

While the amount of rainfall in El Salvador should allow for more than enough fresh water to meet the needs of all Salvadorans, there is not enough to meet the needs of citizens with the country's current development model (UNES, 2005; IA 2015, 2006). A model heavy on waste and destruction of the country's biodiversity, and light on infrastructure and coherent policies. A model geared to the needs of the urban elite and neglectful of the rural poor. Rural areas have largely been ignored by national policy

makers who have been more concerned with the demands of the urban elite than with providing basic services to the rural poor. This has left many Salvadorans with little to build on in terms of finding a solution to their problems, and nobody to turn to for help.

With this in mind, the research focus of this investigation will be on access, control, and distribution of potable water in El Salvador and will focus on the rural community of Delicias, located in the municipality of Santa Cruz Michapa in the central department of Cuscatlán. While Delicias has recently succeeded in gaining access to potable water, other communities in the area have found their efforts frustrated. Delicias has been successful because it has been able to draw on two key ingredients to human cooperation: reciprocity and sociability. Combined, these two ingredients create what Peter Kropotkin referred to as mutual aid more than a century ago. Therefore, the thesis question we will be attempting to answer is the following: does mutual aid serve as a valuable operational and analytical concept for examining the management of a common-property resource (CPR) such as potable water?

II

In a study conducted by Margreet Z. Zwarteveen (1997) on gender and water rights, she identifies four issues relating to water: 1) water rights; 2) water control; 3) water allocation and; 4) water distribution. However, for the purposes of this study we will break the issues up into three categories: (1) access 2) control and (3) distribution. There are a variety of other sub-issues which will need to be addressed such as economics, health and gender. However, they will be discussed here under the umbrella of the above mentioned three issues.

Access

Access to water precedes issues of control and distribution because without it, the latter two issues would never enter into the debate. Whether or not water is controlled by a company, by the state or locally by a community, there has to be access to the resource in the first place. Geography is a very important component of the discussion. Many countries are in geographically strategic regions which benefit their access. Another factor might be the level of deforestation a particular country or region has experienced—a high level of deforestation would make it difficult for water catchments to retain water. The quality of water is a very important issue as well. In fact, David Brooks (2002) argues that in developing countries “freshwater scarcity is defined as much by poor quality as by insufficient quantity”. Even in cases where water is readily available, if it is not potable it cuts out its most important function: that is, for human consumption.¹ If human beings drink poor quality water, they will become sick and can even die, and this is not conducive to development.

Control

Who controls water will contribute immensely to the situation as well. Essentially, when discussing the issue of control over of potable water resources we are presented with four options: state control, market control, community control or alternatively, a mix of these three, as is becoming increasingly common. Control over water resources will play a significant role in determining how water is distributed, and to whom it is distributed. It will contribute to determining the cost, meaning whether it is based on the incentive for profit, or if it is subsidized. It will determine the dependability

¹ This is not to discount all of water's other functions. But for the purposes of this study, human consumption will be considered the most important function of water.

of the service, meaning how frequently and in what quantity water is available. And perhaps most importantly, it will determine the quality of the water falling from the taps.

Distribution

This brings us to the third issue of distribution. No matter how much or how little water people have access to, how it is distributed is a very important issue. Water is distributed for a variety of purposes such as drinking, domestic and sanitation purposes, agriculture, and industrial uses. Distribution ties back to the first two issues because access will determine how much water is available to be distributed and control will determine the decision making processes that ultimately decide how water will be distributed and to whom it will be distributed. These and many other factors will have to be considered when discussing the distribution of potable water.

III

As students and practitioners in the field of international development we have a responsibility to attempt to inform debates aimed at finding solutions to issues such as the lack of adequate access to potable water. My attempt at informing the debate will come by way of introducing an alternative approach to community development and management of a common-property resource, such as potable water. The approach is known as mutual aid, and was best articulated by Peter Kropotkin (1842-1921).

Kropotkin was a naturalist and geographer by profession, but was arguably the most important anarchist thinker and writer of his time as well. Born into the Russian aristocracy as a Prince, he later rejected this title and became an anarchist. As a result of being an excellent student in his youth, he was made Sergeant of the Corps of Pages,

which automatically made him the personal page of Czar Alexander II. He was also a confirmed evolutionist, deeply influenced by Darwin's *On the Origin of Species*, and when it came time for him to choose his military posting he chose the recently annexed and unexplored Amur region of Siberia so that he could pursue his interests in evolution and natural history. However, Kropotkin was surprised that he did not encounter the fierce competition described by Darwin, but cooperation. The only struggle he encountered among the animals and humans living in the region was against the natural elements (see Kropotkin, 1989; Woodcock and Avakumović, 1990; Todes, 1989 and; Dugatkin, 2006). This ultimately led to the development of his theory of mutual aid. Published as a book in 1902, Kropotkin's theory was developed through a series of essays in the influential British scientific journal "Nineteenth Century", in response to an essay by T.H. Huxley (1968) claiming that what evolution teaches us is to turn away from nature as a moral compass because it is a "gladiators show" and "red in tooth and claw".²

Kropotkin's theory offers a different perspective on community and participatory development because he analysed cooperation from an evolutionary perspective. Development thinkers have spent a considerable amount of time discussing the benefits of participation and social capital in community development projects, but do not discuss it from an evolutionary perspective. Mutual aid is based in reciprocity and sociability and Kropotkin argued that it evolved in species through natural selection and was just as innate to human beings as competition. Therefore, his theory may prove beneficial for those attempting to determine why participation and social capital are such valuable components of community development.

² Huxley borrowed the phrase "red in tooth and claw" from Lord Alfred Tennyson

The predominant approach to development has essentially followed two beaten paths. The state-led approach and the market approach. Socialist countries have followed the former approach, while market-based countries have followed the latter, allowing for varying levels of state involvement. Development theory and practice has rarely strayed far from this path. Since the collapse of the Soviet Union, only a few state-led models remain, and in market-based societies the role of the state has been rolled back significantly. This has allowed for neoliberalism, based in the social-Darwinist principle of the “survival of the fittest”, to move to the fore with practically no challengers in sight. “The triumph of the West, of the western *idea*,” Francis Fukuyama (1989) has written “is evident... in the total exhaustion of viable systemic alternatives to Western liberalism” (p.3).

Yet, while social Darwinist’s based their evolutionary theory on the violent struggle for existence where only the strongest survive, Kropotkin pointed to the more practical aspects of human nature which relied on collective action and responsibility as the pillar of human and social evolution. Kropotkin did not deny that competition was one factor in the evolutionary process, but he did contend that mutual aid was the *most important* factor to the survival of a species or group as a whole. Kropotkin concluded that the natural conditions of life were what shaped the relations within a species and these conditions led to mutual aid:

In the animal world we have seen that the vast majority of species live in societies, and that they find in association the best arms for struggle for life: understood, of course, in its wide Darwinian sense-not as a struggle for the sheer means of existence, but as a struggle against all natural conditions unfavourable to the species. The animal species, in which individual struggle has been reduced to its narrowest limits, and the practice of mutual aid has attained the greatest

development, are invariably the most numerous, the most prosperous, and the most open to further progress (p.293).

Michael Glassman (2000) sums up the entire theory in the following way:

“Mutual aid outlines how weaker species very often survive in the face of stronger, and at times seemingly insurmountable, opposition through sociability” (p.393). Kropotkin’s theory of mutual aid will serve as the basis for the approach to community development proposed in this study. We will also draw on the literature from the field of evolutionary biology from recent years to help fill in the gaps left by Kropotkin due to the lack of scientific knowledge in his day.

IV

In section II of this chapter, three key issues were identified to be addressed in my thesis: (1) access, (2) control and (3) distribution. The methodology I have used to assess these three issues is twofold and is based on primary and secondary information. First, the relevant literature related to potable water issues was reviewed in order to extract the appropriate questions and analyse the reality found in Delicias and; secondly, fieldwork was conducted in El Salvador in order to provide me with the opportunity to continue reviewing the literature using Salvadoran sources and to conduct primary research.

The study is largely qualitative, however, given the nature of this project some quantitative data has been used when required. For example, there has been a significant amount of statistical analysis of the situation conducted by various think tanks, international organizations, as well as governmental and non-governmental organizations (NGO). These statistics have been acknowledged and used when useful, keeping very much in mind however, the source, quality and purpose of these statistics. Furthermore,

when presenting statistical information, definitions must be kept in clear sight. For example, when considering the percentage of Salvadorans with access to potable water, the standards for potable water classification must be clear. Also, how many hours per day access is provided has to be considered, as would the distance traveled to obtain access. These are just a few examples of the necessary considerations that have been made when introducing quantitative data.

In recent years there has been a growing body of literature on water related issues. There have been books written by various environment and development professionals, development agencies, journalists, and activists who take different stances and different approaches to presenting their views on water issues. Many organizations such as the United Nations Economic Commission on Latin America and the Caribbean (better known in Latin America by its Spanish acronym CEPAL) and the International Development Research Centre (IDRC) have also done extensive, book-length studies on water issues which directly apply to Latin America. Many NGOs such as the Centro Salvadoreño de Tecnología Apropiada (CESTA), the Fundación Salvadoreña para el Desarrollo Económico y Social (FUSADES—Salvadoran Foundation for Economic and Social Development) and CARE El Salvador have produced documents and case studies. Salvadoran think tanks such as the Programa Salvadoreño de Investigación Sobre Desarrollo y Medio Ambiente (PRISMA—Salvadoran Program for the Study of Development and the Environment) and the Centro para la Defensa del Consumidor (CDC—Center for Defence of the Consumer) also publish public documents on water issues. The above resources have been drawn upon to consider cases from around the world and the region, and on El Salvador itself.

The initial materials used to develop this thesis came in the form of published books, academic papers, governmental and non-governmental reports, evaluations and project assessments, newspaper, magazines and journal articles, etc. Much of this literature was found and accessed in Canada via NOVANET, but the library at the Canadian International Development Agency (CIDA) also proved to be an invaluable source of information. Salvadoran governmental agencies such as the Administracion Nacional de Acueductos y Alcantarillados (ANDA—National Administration for Aqueducts and Sewage Systems) and the Ministerio de Medio Ambiente y Recursos Naturales (MARN—Ministry of the Environment and Natural Resources) also helped create a good, intellectual map of the potable water situation in El Salvador. Finally, the University of Texas' Latin American Network Information Center (LANIC) website is always an invaluable resource when researching Latin American issues.

Prior to departing for El Salvador, the above sources provided an excellent framework for directing my fieldwork. Having said that, the overwhelming majority of the literature directly pertaining to potable water issues in El Salvador was obtained in El Salvador itself. Much of the information on this issue is simply not available in Canada and was only obtained while conducting my fieldwork between October 2005 and April 2006.

My field work focused on the community of Delicias in the municipality of Santa Cruz Michapa in the department of Cuscatlán. In order to obtain the primary data used for this study, semi-structured interviews were conducted with government representatives, community leaders, representatives from NGOs and development agencies. Focus groups (FG) with community members were also held regularly between January and April 2006 in order to gauge the opinions and experiences of the local

population. During my fieldwork, an indexed journal and field notes were also kept which have been used in conjunction with the available literature and interviews carried out.

V

This thesis is comprised of five separate chapters. Following the introduction, Chapter 2 will be a review of the literature on potable water, management of the commons, international development theory and evolutionary biology as they relate to the issues and proposals I have identified above and Kropotkin's work on mutual aid. The review will be broad in scope, discussing various issues on several continents. Chapter 3 will be the case study. It will look at the reality that I discovered in El Salvador while conducting my fieldwork, and will be particularly concerned with the real life circumstances found in Delicias. The overwhelming majority of the material used for Chapter 3 was collected in El Salvador itself. I will begin by looking at water at the national level in El Salvador, followed by the rural level, and conclude by focusing specifically on Delicias. Chapter 4 will be an analysis of Kropotkin's theory of mutual aid, in relation to the case study and the literature review. It will be concerned with how a mutual aid approach could serve as the basis for community development, particularly in the context of managing a common-property resource such as potable water. Finally, Chapter 5 will conclude by summarizing the material from Chapters 2 through 4 and proposing specific recommendations as to how rural communities might organize themselves in order to gain access to potable water, based on the organizational principles of mutual aid.

This study will attempt to demonstrate that while other communities in the very same municipality have not been able to succeed in implementing their own community water system because they continue to fall back on the social Darwinian principle of the survival of the fittest, Delicias has been successful because they have relied upon what Kropotkin would have described as a mutual aid approach to community development. They have learned to bridge the divisive gaps that previously prevented the achievement of their goals. Not only do they now have a functioning community water system that pumps water into almost every home, they also have a community development model that they continue to apply to new community projects.

Chapter 2—Literature Review

I

The purpose of this chapter is to familiarize the reader with my topic by reviewing the literature on potable water in the context of international development. It will begin by providing a brief historical sketch of development. This will be followed by a review of definitions of development in order to help define the scope of what is meant by development in this study, and how potable water contributes to development. Next we will review four of the most influential theories of development over the past half century in order to make the point that development policy over the decades, both in the developed and developing world, has closely followed the prescriptions of these theories. Embedded in these theories—even though it is often not overtly stated—are approaches for providing citizens in developing countries with potable water. From this broad perspective, we will then begin to narrow the debate by looking at the sub-category of community development, participation and social capital. The next section will be dedicated to theories of evolution, including Kropotkin's theory of mutual aid. This will then lead us into the debate over the commons. Finally, a brief description of the water cycle will be given in order to familiarize the reader with the mechanics of water in nature before arriving at the three issues identified to discuss potable water in this study: access, control, and distribution.

II Historical Background

Amartya Sen traces the first piece of development advice back to 1676 when Sir William Petty told the French that their economy was growing too quickly. Many trace the idea of development itself, back to the Enlightenment idea of linear progress or even as far back as the Ancient Greeks, who believed in the cyclical descent from a “Golden Age” (Dunkley, 2004). Mike Mason (1997) contends that the concept of “development” is an “entirely Western concept” that could be traced to the French philosopher Henri Saint-Simon (1760-1825) and to the ideas of the late 18th and early 19th century classical political economists who conceptualized “development” as “orderly economic growth” through trade and unfettered by state interference. “Their views about trade and markets” Mason writes “bordered on the metaphysical—that is, on the basis of signs rather than science—yet they held strongly to them” (p.18). One of the most common ways that the history of development is described in texts and classrooms is to trace its inception to the creation of the Bretton Woods institutions in 1945, then travelling from modernization theory, on through the theories of underdevelopment, up to neo-liberalism and the Washington Consensus (Kothari, 2005).

But others, such as those of the post-development school of thought trace development to a very specific date; U.S. President Harry Truman’s inaugural speech before Congress on January 20th, 1949 in which he labelled the poor countries of the world, which represented some two billion people as “underdeveloped” (Truman, 1964). Prior to this time, poor Western countries had simply been seen as being “undeveloped” (M. Mason, 1997).

III Definitions of Development

What does “development” mean, and what does it mean to be “developed”?

Many academics have attempted to devise a definition of development, as have development agencies from around the world. Definitions usually either come from a purely economic perspective on the one hand, or a socio-political one on the other. However, it is not all that uncommon to mix and match. Over the years these definitions have changed, yet developers have come no closer to achieving a consensus on exactly what development is. According to Fry and Martin (1991) this is due to the fact that development is often uneven and unequal, and in many cases, the development of one group comes at the detriment of others. “As a result, the concept of development has undergone considerable scrutiny and constant redefinition, often in an attempt to wrest the meaning away from those who would define it in overly narrow, culturally biased terms or those who perceive it in terms of a single discipline such as economics” (p. 98). This has also led to the breaking down of development definitions into sub-categories such as community development, rural development, sustainable development, etc. Guy Arnold (1996) adds: “Development is not simply about economic growth but covers the whole range of human improvement: economic growth and the capacity to produce; a viable and efficient infrastructure; education; health; housing and general social conditions; child care; the role of women; concern for minorities” (p.46). In a survey from the mid-1980s, 72 separate meanings of the word were registered (Martinussen, 1997: 35). Thus, it is easy to conclude that there are too many definitions of development. Cowen and Shenton (1996) even argue that:

Development defies definition... because of the difficulty of making the intent to develop consistent with the immanent development. International development... consists of the means to

compensate for the destructive propensities of immanent change. The difficulty arises because, while an immanent process of development encompasses the dimension of destruction, it is difficult to imagine why and how the intent to destroy should be made in the name of development (p.438).

It is also important to distinguish between development and international development, as the latter often refers to the transformation of a society by, or with the help of, an outside actor. Still, this brings us no closer to the meaning of the word.

According to Fry and Martin (1991), development is a “process leading to a higher quality of life for a given population. Development involves both the determination of goals and the means of achieving those ends” (p.98). Kofi Buenor Hadjor contributes another definition claiming that development “implies changes in technology and an increase in useful material resources... [and] lack of development means that most people have insufficient material resources and are obliged to struggle even to survive” (Hadjor, 1992: 100).

One of the most widely recognized development agencies in the world is the United Nations Development Program (UNDP). At the beginning of the 1990's, the UNDP began focusing on what it called “human development”. According to the UNDP (1991a):

The basic objective of human development is to enlarge the range of people's choices to make development more democratic and participatory. These choices should include access to income and employment opportunities, education and health, and clean and safe physical environment. Each individual should also have the opportunity to participate fully in community decisions and to enjoy human, economic and political freedoms (p.1).

Each year the UNDP publishes its Human Development Index (HDI), ranking each country from most to least developed. While many development agencies focus

primarily on GDP as a measurement of development, the HDI is based on a combination of GDP, education levels, and life-expectancy. While the HDI is not considered to be a complete measurement of development, it is often considered to be more comprehensive than others.

The above definitions all seem to assume one thing in common. That is, development leads to an improved quality of life. This could mean the ability to consume more, to live a longer and healthier life, to enjoy more personal and political freedom, to have a better education, or perhaps all of these things combined. In this study however, we are more concerned with how potable water is able to serve as a catalyst leading to any of these definitions of development than we are with the term development itself. The beauty of focusing on water is that it fits any definition of development, and thus, definitions do not have to be bent to suit the issue.

I am of the view that a definition should be as all-encompassing as possible when trying to explain a term as broad as development. The definition that seems to come closest to achieving this is that of the UNDP's vision of human development. It takes into account social, economic and environmental aspects and leaves enough flexibility to look at the issue from the local, national, or global perspective. Therefore, by relying on such a broad definition, when discussing water in relation to development, we do not have to focus narrowly on one aspect of water, be it social, economic, or environmental, but can look at it from all perspectives. Finally, although both development and water can be discussed from a local, national, regional, or a global perspective; we will primarily be concerned with discussing them from a local perspective. Other perspectives are important as well, but they simply do not fall within the scope of this study.

IV Theories of Development

As was already pointed out, theories of development have traditionally arisen from two fundamental approaches: the state-led approach to development and the market-led approach to development. The choice of one as a basis for policymaking over the other has had a significant impact on the way in which water resources have been managed around the world. Here we will briefly review those development theories.

Modernization Theory

So called modernization theory was the most dominant theory influencing development policy toward the South in the 1950s and into the 1960s. It was based almost exclusively on the idea of economic growth and drew extensively on the work of Max Weber and Emile Durkheim. Modernization theorists believed that the primary obstacles to growth in the underdeveloped world were due to a lack of capital and the primitive cultures of their inhabitants.

The most famous proponent of the Modernization school of thought was the American economist W.W. Rostow, and his *Stages of Economic Growth* (1959)³ was a response to the growing socialist sentiments developing in the former colonies. Rostow maintained that essentially, all countries in the world go through the same process of economic growth and in order for the Third World to catch up with the First World, this process need only be sped up through capital investment, technology, and modernized education, etc. Rostow believed that there were five stages to economic growth through which the newly independent former colonies would have to pass:

- 1) The Traditional Society

³ The *Stages of Economic Growth* later published as a book in 1960.

- 2) The Pre-conditions for Take-off
- 3) The Take-off
- 4) The Drive to Maturity and
- 5) The Age of High Mass Consumption

The fifth stage was presumably the one being enjoyed by the First World. Rostow believed that poor nations were at somewhat of an advantage because they could simply replicate the experiences of the industrialized world. This concept of linear developmentalism can be traced to eighteenth century ideas of progress (Biel, 2000). However, while Rostow saw the first four stages moving in a linear fashion, contrary to Marx, he believed that the fifth and final stage would not inevitably lead to communism:

Applied to societies, this innately paradoxical [Marxist] view of the human condition—a view which regards man as a complex household rather than a maximizing unit—does not yield rigid, inevitable stages of history. It leads to a succession of patterns of choice—varying in their balance—made within the framework permitted by the changing setting of society: a setting itself the product of both objective material conditions and the prior choices made by men (p.15).

Rostow was also convinced that since the question of agriculture was so sorely neglected in Marxist theory, it was incapable of dealing with development.

To a great extent Rostow's influence stems from the simplicity of his theory. However, his vicious anti-communism and willingness to resort to military means to breathe life into his own theory made him one of the most controversial political figures of the 1960's (Menzel, 2003).

Dependency Theory

In response to modernization theory, and influenced by the rise of socialism, dependency theory enjoyed a great deal of popularity in the 1960s and 1970s and often

responded to modernization theory point by point, (Rist, 1997). Rather than being a liberating force, dependency theorists saw capitalism as a way of imposing a neo-colonial and imperialist structure that allowed the First World to systematically drain the economic surplus out of the Third World.

Andre Gunder Frank (1966) made one of the most notable contributions to Dependency theory through his thesis on "The Development of Underdevelopment". Frank developed the concept of metropolises and satellites, the former representing the First World and the latter representing the Third World. He contended that since the sixteenth century the world's imperial powers had been draining the resources out of their colonies and continued to do so in the post-colonial era by skewing the international terms of trade. These trade conditions between the metropolises and satellites could be seen as having a pyramidal structure with the rural poor of the satellites at the bottom and the ruling classes of the metropolises at the top. Taking issue with the view presented by modernization theory that capitalism is the best model to create development, Frank argued that development in the metropolis and underdevelopment in the satellites are simply two parts of the same coin of international capitalism and one is in fact, dependent upon the other (Kay, 1989). According to Frank's theory, rather than using its own resources to foment development, the satellites' loss of its investment potential led to further underdevelopment in the South and massive accumulation of wealth and power in the North, primarily in the US. Rather than being an historical phase as Rostow contended, Frank argued that underdevelopment was in fact a process and the only way to stimulate autonomous development in the Third World was by the weakening or complete de-linking of the satellites from the metropolises. Frank hypothesized that development in

the past in Latin America had only occurred in the satellites when ties to the metropolis were weakened.

In the opinion of Frank and other dependentistas, old-school colonialism was simply replaced by new-school neo-colonialism and the only way the Third World could escape this system was through socialism. Furthermore, since the metropolis would never wilfully allow this to happen and the elites in the satellite countries were equally dependent on this structure, the only road to socialism was by revolution (Kay, 1989).

Dependency began to challenge modernization theory and found a welcoming audience in the Third World. Yet, despite its popularity, over time dependency theory began to be the target of a great deal of criticism from both the right and the left. While some criticisms were based on oversimplified interpretations, others remain valid. One of the most significant criticisms of dependency is that it is far too totalizing and abstract to be valid. It was argued that dependency presented a tautological argument that the South was underdeveloped because it was dependent on the North and the characteristics of underdevelopment were attributed to its dependence. Critics argued that while many of the South's characteristics could be attributed to factors other than dependence on the North, dependency theory was incapable of explaining them (Dickson, 1997).

Neoliberal Theory

Policies based on neoliberal theory and its associated agenda began to gain significant momentum in rich countries like the United Kingdom and United States in the 1960s and 70s, but in John Harriss' (2005) view, it was really just a repackaging of classic liberalism. Carlos Alberto Montaner (2000) describes neoliberalism as: "nothing more than an array of adjustment measures designed to alleviate economic crisis... reductions in government spending, reductions in the public sector payroll, privatization

of state enterprises, a balanced budget, and careful control of monetary emissions—pure common sense in the wake of an interventionist model that failed to produce widespread progress” (p.61-2). One of the most important contributors to neoliberalism was Friedrich von Hayek of the Chicago School. Hayek passionately rejected state intervention in the economy, believing that it was the “road to serfdom”. The theory preaches denationalization of government industry and deregulation and espouses free markets as the only viable path to economic prosperity. Neoliberalism eclipsed modernization theory in the 1960’s and 70’s and today, despite a barrage of criticism, dominates international development policy (M. Mason, 1997).

Many developing countries were exposed to neoliberalism in the 1980s through structural adjustment programs (SAPs). Structural adjustment loans were given to help finance imports, and were conditioned on the adoption of free market policies. SAPs were premised on the idea that in order for individual projects to be productive, big reforms were necessary (Easterly, 2006). They were intended to “adjust to and weather crisis” (Stiglitz, 2003) by addressing poor governance, government excess in spending and intervention in the market and state ownership (J. Sachs, 2005). Although they are now viewed by many with contempt, SAPs were enthusiastically imposed on stagnating Third World economies by the International Monetary Fund (IMF) and the World Bank.

By the end of the 1980s, the standard procedure in international economic policy circles was to apply a system based on neoliberal ideas, and in 1990, John Williamson summed up the policy consensus reached between the IMF, the World Bank, and the U.S. executive branch which has become known as the “Washington Consensus”. The Washington Consensus rejected most development thinking, instead applying the prescriptions of fiscal prudence, outward orientation, and free markets trumpeted in

classical economic theories (Peet and Hartwick, 1999). However, Stiglitz claims that the results of the Washington Consensus have not been encouraging. He argues that those countries that have embraced its tenets, have found payoffs arriving too slowly, and where benefits have come, they have been unequally distributed. Furthermore, he contends that it has exposed many developing countries to greater risks.

Opponents of neoliberalism such as Ha-Joon Chang (2003), contend that neoliberal prescriptions are essentially a way of “Kicking Away the Ladder” of development on the South because they preach the economic policies used in the developed world today rather than the policies they used to get there in the first place. Relying on an historical analysis, Chang notes that most now-developed countries (NDC) were highly protectionist, only allowing their key industries to be challenged by free trade after they were strong enough or in cases where there was virtually no competition to begin with. Cristobal Kay (1989) criticizes neoliberalism based on his view that it has only served to increase foreign debt and while it has benefited a minority, it has driven the great majority into greater poverty. Neo-Marxists critics like Petras and Veltmeyer (2001) present a more scathing criticism still, contending that neoliberalism is actually the new imperialism in the 21st century.

Sustainable Development

Since the industrial revolution, human beings have increased their ability to consume natural resources exponentially. The World Commission on Environment and Development (WCED, 1987) notes that following the Second World War this ability shot up even further.⁴ Echoing Malthus’ earlier prediction, throughout the 1960’s and 70’s

⁴ It should not pass without notice that this is essentially the same historical period when the era of international development began.

more and more influential studies such as Ehrlich's *Population Bomb* (1968) and Club of Rome's *The Limits to Growth* (1972) began to seep into development thinking (W. Sachs, 1999), affecting theory, policy, and practice.

In the middle of the "lost decade" of development (1980s), a new vision emerged: sustainable development. "[W]hile many Third World economies went into deep decline," Mason (1997) writes "at the official level came an earnest reassurance that development still mattered (p.29). In 1987, the WCED published its report "Our Common Future", proposing a new approach to development that would reconcile environmental conservation with economic growth. The goal of sustainable development was to "ensure that it [humanity] meets the needs of the present without compromising the ability of future generations to meet their own needs" (p.8). Mason remarks that sustainable development thus became a "new developmentalist catchphrase" with the intention of placing the eradication of poverty along side preservation of the environment.

As a concept, sustainability has been widely adopted by people and groups from a variety of backgrounds and ideologies. However, it has also received scathing criticism, starting with the definitions itself. Gilbert Rist (1997) argues that the definition would not be able to inform any comprehensive policy because it is "singularly lacking in content, managing to combine unwarranted assertions with points that run counter to the truth" (p.181). Because the term itself is "inherently self-referential" Wolfgang Sachs (1999) adds, we are left with no clear idea of what needs to be kept sustainable, meaning that it can be used by practically anybody to serve almost any purpose (p.81).

The concept of "sustainable growth" serves as a case in point. Herman Daly (1993) soberly points out that it is impossible for world the economy to grow out of poverty while at the same time growing out of environmental degradation, as the concept

would imply. “As the economic subsystem grows” Daly writes “it incorporates an ever greater proportion of the total ecosystem into itself and must reach a limit at 100 percent, if not before” (p.267). Yet, despite the fact that the notion is a complete contradiction, it is widely used by many thoughtful people from different fields.

V Community, Participation and Social Capital

“Community development” write Dore and Mars (1981) “is probably as old as recorded history—at least in the sense of attempts, through some kind of collective actions, to ‘improve’ a (predominantly rural) community’s material and spiritual life—‘improvement’ being defined sometimes by new ideals preached by reforming prophets, more often by reference to other communities deemed in some sense ‘more advanced’”. What is new, they observe, is the “bureaucratic institutionalization of community development” (p.13).

The classic theories of modernization were opposed to popular participation, in some cases, even viewing participation and democracy as being incompatible with the rapid economic growth promised by their theory. They believed that the poor in the Third World lacked the imagination and foresight to plan for a better future (Martinussen, 1997). The notion that participation is a “basic ingredient” in fomenting progress arose to a great extent from the failure of the growth strategy espoused by modernization. The inability of such strategies to alleviate poverty made it necessary for the state to direct resources towards needier sectors (Hall, 1988). The cooperative movement and the idea of small-scale development and village self-reliance espoused by Ghandi and his followers as an antidote against the corrosive effects of colonialism and modernization

played a significant role in influencing community-based forms of development in the South, as did the Frierian notion that the “oppressed” had to unite to bring about any sort of positive change in their lives (Mansur and Rae, 2004).

Hall defines “authentic participation” in community development as the involvement of a broad spectrum of a community in every phase of the project, from selection and design to execution and ex-post evaluation. He argues that this does not simply entail following orders, but to have “autonomy of decision-making” in undertaking initiatives. “The central issue, then, is that of power” (p.94). Others, such as Mansuri and Rao (2004) claim that community-based development entails the involvement of a “defined community” in at least “some aspects” of the design and implementation of a project. They argue that the “a key objective is the incorporation of local knowledge into the project’s decision-making processes”. Furthermore, the authors maintain that “[p]articipation is expected to lead to better designed projects, better targeted benefits, more cost-effective and timely delivery of project inputs, and more equitably distributed project benefits with less corruption and other rent-seeking activity” (p.6).

However, Botes and Rensburg (2000) complain that “community participation” is one of the most overused, but at the same time, least understood concepts in the developing world. They believe it is frequently used without any serious effort to conceive of the various forms it might take. Moreover, Raff Carmen (1996) points out that “‘community’ is a term and concept of almost infinite elasticity, readily adopted by the entire spectrum of political persuasion... The chameleon-like features of the term community allow it to be stuck on an almost infinite variety of goods” (p.78-9). Finally, in the same vein as Dore and Mars (see above), Nelson and Wright (1995) point out that

the concept of “community” is not usually applied by community members themselves, but by outsiders who set the parameters of what the community’s “needs” are.

Over the past few decades, collective action among the underprivileged has been growing in developing countries in order to improve their quality of life. The activities these groups take on varies widely from purely economic to more holistic approaches that integrate the economic sphere with social development and even spiritual advancement. Some of these organizations are grassroots and form spontaneously, while others are the product of “external interventions” (Rahman, 1995). Community-based development initiatives that rely on participation are also increasingly popular with major development institutions, which are earmarking significant funding for such projects (Mansuri and Rao, 2004).

The push for more participation in the recent past was led by leading non-governmental organizations (NGOs), but has since been adopted by the major donors as well as many national governments (Brett, 2003). Anthony Hall (1988) observes that “beneficiary involvement of one form or another in different stages of the project cycle has been advocated by all the major post-war development policies” (p.92). E.A. Brett (2003) recalls that in the past, the demand for participation separated the left from the right, but today even conservatives acknowledge that hierarchical structures “can be subjected to democratic forms of control”. Brett concludes that “[t]he fact that these demands have now moved from a radical fringe occupied by nineteenth and twentieth century libertarian socialists like Kropotkin, and Paolo Freire... to the mainstream donor agencies, clearly represents a ‘profound... revolution’ in development theory” (p.2).

Despite its widespread support and application however, participation in community projects has many critics. Some see it as being much more limited in its

ability to lead to progress, while others go as far as to see it as a “tyranny”. One of the earlier criticisms of participation came from Mancur Olson (1965). Olson argued that individuals, even in a group setting, act in their own individual interest. He claimed that “... unless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act to achieve their common or group interest...*

These points hold true” he concludes “even when there is unanimous agreement in a group about the common good and the methods of achieving it” (p.2; original emphasis).

Hall (1988) sees participation as a limited solution. “It is a moot point” Hall writes “whether it is possible to achieve a substantial degree of community participation in the decision-making process without simultaneously undertaking structural reforms” (p.94). The most important point, he maintains, is “to avoid falling into the trap of believing that increasing the level of people’s participation is the key to successful development” (p.107). While he acknowledges the value of participation, he argues that it should not be allowed to detract from efforts to eliminate the structural obstacles that hinder development.

Bill Cook (2001) concerns himself with the social psychological analysis of how participation in groups plays itself out and how it can restrict participatory development from achieving what it claims to be able to achieve. He argues that participation can lead to risky decision making, and that it can be used to manipulate the ideological beliefs of group members. Critics also argue that the promotion of participatory community development, rather than being an empowering process, often only serves to transfer the costs from the agencies to the users (Brett, 2003). Finally, one of participation’s biggest vulnerabilities is exposed by critics that argue that participatory development projects are

usually pre-packaged projects delivered by development agencies more interested in extracting approvals from community members than actually empowering them. The consultations are simply a way of legitimizing pre-designed projects (Botes and Rensburg, 2000).

In Martinussen's (1997) view, one thing that most participatory perspectives have in common is the recognition that the development process does not always distribute the benefits of a project equitably according to need, effort or merit. Instead, benefits tend to be distributed according to economic and political power. Therefore, he argues that a prerequisite for a fair distribution of the benefits, is that "each population group has to organise itself according to common interests" (p.236). "A more useful approach [to participatory community development]" writes Mohan (2001) "acknowledges the political nature of participatory development and the conflicts that this necessarily involves" (p.166). Brett (2003) concludes that for participation to be successful, it will have to be "reconciled with expertise, low cost decision making, and discipline in organisational systems" (p.3).

In the 1990s, the concept of "social capital" appeared as an important additive to projects based on community participation. Robert Putnam (1995) has played a key role in popularizing social capital, which he describes as the "features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (p.67). Francis Fukuyama (2000) is another prominent proponent of social capital. He defines it as "an instantiated set of informal values or norms shared among members of a group that permits them to cooperate with one another", and he sees "trust as the lubricant that makes any group or organization run more efficiently" (p.98).

Social capital tends to focus more on networks than on individuals interests, while at the same time lending itself to efforts to transfer the responsibility for decision making from the state to community organizations. Furthermore, it promotes fostering linkages between different sectors such as health and education (Schuller *et al*, 2000). Fukuyama (2000) sees it as critical to the creation of a healthy civil society because it allows different groups to defend their interests against powerful entities like the state by banding together. It is not “a rare cultural treasure” passed from one generation to the next that can never be recovered if it is lost, but rather something “created spontaneously all the time by people going about their daily lives” (p.102-3).

But despite all the fanfare, social capital is not without its weaknesses. Like participatory development, some suggest that social capital merely provides the state with the opportunity to renege on its social responsibilities by divesting them to community or voluntary groups (Schuller *et al*, 2000). Other criticisms laid against social capital are that it does not address issues of class and power and it's proponents fail to acknowledge that it has an equal potential for being destructive as it does for being constructive (Mansuri and Rao, 2004). None-the-less, it is a term that will continue to play a role in development policy and practice as its true value is debated among scholars.

VI Theories of Evolution:

“Survival of the fittest” is the most commonly used phrase from evolution in everyday life (Smith and Sullivan, 2007). It is also one of the most influential ideas applied to the construction of our social systems. However, it was “natural selection” that Charles Darwin (1998) identified as the driving force of evolution, and only borrowed the

phrase survival of the fittest from Herbert Spencer as a metaphor for his theory. “This preservation of favourable individual differences and variations, and the destruction of those which are injurious,” Darwin wrote “I have called Natural Selection, or the Survival of the Fittest” (p.108). This, he theorized, could play itself out in many different ways. It could be through competition for mates, or it also could mean adaptation to natural conditions. Darwin’s theory has become one of the most powerful ideas in human history.

In *The Origin of Species*, Darwin focused exclusively on animal species and primarily concerned himself with individual selection. However, more than two decades later, in *The Descent of Man* (2007), Darwin turned his attention to human beings and also proposed what has become known as group selection, that is, characteristics that evolve, not for the sake of the individual organism, but for the group or species as a whole.⁵ “With those animals which were benefited by living in close association, the individuals which took the greatest pleasure in society would best escape various dangers; whilst those that cared least for their comrades, and lived solitary, would perish in greater numbers” (p.167). Furthermore, he believed that if any animal’s intellectual powers developed to the level of human beings’, it would inevitably result in “a moral sense or conscience” (p.157). He labelled these characteristics as “sociability” (pp.159-70), and theorized that acts of reciprocity and defence of the group were not contrary to nature, but in fact, the result of natural selection. Despite the fact that the theory was applied directly to humans, most evolutionists have preferred to focus on individual selection and many have made a considerable effort to debunk any reference to group selection.

⁵ Sexual selection is another important concept that appeared in *The Decent of Man*, but does not concern us here.

Thomas H. Huxley was one such evolutionist, and was fascinated by competition in nature. Known to many as Darwin's "bulldog", he was probably the most important advocate of Darwin's theory of evolution. However, he had little time for Darwin's views on sociability. In an essay published in the popular science journal *Nineteenth Century*, a few years after Darwin's death, Huxley (1968) wrote:

"From the point of view of the moralist the animal world is on about the same level as a gladiator's show. The creatures are fairly well treated, and set to fight—whereby the strongest, the swiftest, and the cunningest live to fight another day. The spectator has no need to turn his thumb down, as no quarter is given (p.199-200).

Most evolutionary biologists have adopted a similar view of nature as that expounded by Huxley to the point that it seems almost commonsensical, even to the layperson. Hence the common usage of the expression "survival of the fittest".

At roughly the same time that population theory and the mainstream evolutionary theories that followed were penetrating the English psyche, mutual aid theory was emerging in Russia. While industrial England was obsessing with the issue of overpopulation and trying to cope with class conflict brought about by the French Revolution, "pre-revolutionary Russia was largely a vast, untamed wilderness where one could travel for days without seeing another human being" (Glassman, 2000: 392). The seeds of mutual aid can be found in the work of many Russian scientists, but credit is owed to Karl Fedorovich Kessler (1815-1881) for turning it into a mature theory of evolution, and to Peter Kropotkin for further refining and introducing mutual aid to the English-speaking world (see Todes, 1989).

Upon reading Huxley's essay, Kropotkin felt compelled to publish his findings from his five-year, 50,000 mile voyage into Siberia, which began when he was only

nineteen. A journey equally remarkable as that of Darwin's tropical voyage on the HMS Beagle at age twenty-two. Kropotkin (1989) took issue with Huxley's interpretation of evolution, writing:

It happened with Darwin's theory as it happens with theories having any bearing upon human relations. Instead of widening it according to his own hints, his followers narrowed it still more... The numberless followers of Darwin reduced the notion of struggle for existence to its narrowest limits. They came to conceive the animal world as a world of perpetual struggle among half-starved individuals, thirsting for one another's blood. They made modern literature resound with the war-cry of woe to the vanquished, as if it were the last word of modern biology (p.3-4).

While Darwin's followers based their evolutionary studies on the violent "struggle for existence"⁶ found in "On the Origin of Species", Kropotkin was more impressed by Darwin's later writings on reciprocity, sociability and cooperation found in the Descent of Man. This is what Kropotkin had witnessed on his journey through Siberia and what he believed to be the pillars of evolution. Although he did not deny that intra-specific competition was one factor in the evolutionary process, he contended that "*mutual aid is the predominant fact of nature*" (Kropotkin, 1992: 14, original emphasis). He concluded that the natural conditions of life were what shaped the relations within a species and these conditions led to mutual aid (Kropotkin, 1989):

In the animal world we have seen that the vast majority of species live in societies, and that they find in association the best arms for struggle for life: understood, of course, in its wide Darwinian sense-not as a struggle for the sheer means of existence, but as a struggle against all natural conditions unfavourable to the species. The animal species, in which individual struggle has been reduced to its narrowest limits, and the practice of mutual aid has attained the greatest

⁶ Another metaphor used by Darwin to describe his theory of natural selection. This time borrowed from Malthus, who influenced Darwin a great deal.

development, are invariably the most numerous, the most prosperous, and the most open to further progress (p.293).

In short, Kropotkin's "cardinal premise," the late Stephen Jay Gould (1991) writes, is that "the struggle for existence usually leads to mutual aid rather than combat as the chief criterion of evolutionary success. Human society," Gould continues "must therefore build upon our natural inclinations... in formulating a moral order that will bring both peace and prosperity to our species" (p.331). In Russia, classical Darwinist's of varying political perspectives felt no need to criticize Kropotkin's work as it was in keeping with the national tradition. It was only when his theory was brought into contact with contrary British theories that Kropotkin was forced to defend himself (Todes, 1987 and 1989).

"Kropotkin's thesis" Glassman (2000) claims "seemed to be lost for a number of historical and political reasons". One of the main reasons is that Kropotkin's anarchist activities resulted in his imprisonment in Russia and France,⁷ which transformed him into a political pariah in Western Europe. The fact that Huxley died without responding to his thesis, and that Kropotkin himself died before publishing a follow-up to *Mutual Aid* serves as another (p.399). Of course the theory went far beyond Kropotkin in Russian scientific circles, but since these findings were published in Russian, they were inaccessible to an English speaking audience (Gould, 1991). Therefore, the only window Western scientists' had to mutual aid was through Kropotkin, and by association anarchist agitators and assassins.

Another serious obstacle to the dissemination of mutual aid has been that leftists have abandoned evolution as a viable path to social progress. The hope that human

⁷ In fact, one of Kropotkin's first books (1887) was entitled *In Russian and French Prisons*.

beings are somehow perfectible traces back as far as Plato, and leftists have clung firmly to the idea. Therefore, if human nature was truly “red in tooth and claw” as Lord Tennyson and Huxley suggested, the dream of a society based on peace and cooperation was lost. Therefore, leftists have preferred the unscientific view that the human mind is a “blank slate” and that harmony and prosperity could therefore, be brought to the world through education (Singer, 1999). This is not to say that this view is strictly associated with the political left, it is held near and dear by the right as well, and the very suggestion that human beings might have an innate organization often strikes fear into people’s hearts and minds. But acknowledging that there is something called human nature is not to suggest we have to abandon our value system. “It does not...” Steven Pinker (2002) concludes “require one to abandon feminism, or to accept current levels of inequality or violence, or to treat morality as a fiction” (p.ix).

Finally, until the 1960s, evolutionary theorists themselves ignored the role that cooperation plays in the survival of an organism and its reproductive success (Singer, 1999).⁸ Even still, although the existence of cooperation and altruism began to receive recognition in the 60s, the link with group selection was rejected as an explanation for more individualistic explanations (Wilson and Wilson, 2007). It has only been in recent years that *some* evolutionary biologists have begun looking at cooperation from any perspective other than the individualistic lens.

While much of what Kropotkin wrote about human cooperation over a century ago flies in the face of what current thinking would suggest—that human beings are naturally violent, competitive egoists—child psychologist Melanie Killen and zoologist Marina Cords (2002) point to the large body of work demonstrating that, while not

⁸ Of course, the exception is Kropotkin and the other Russian scientists whose work is not well known.

completely peaceful, in the absence of adult supervision, children resort to a variety of strategies to avoid letting disputes negatively affect their social relations. They also point to research on primates that has produced similar findings. Since the time Kropotkin wrote *Mutual Aid* to the present, a sound theoretical framework has evolved in the study of cooperation, which appears frequently in evolution and social behaviour literature. In particular, since the early 1960's, scientists have delineated four paths to cooperation: reciprocity, by-product mutualism, kin-selected cooperation, and group selection. While a great deal of this literature is a discussion of animal behaviour, Dugatkin (1997) also sees it as an opportunity to deal with the pressing question of the commons.

VII The Commons

Writings on the role of population in resource management have a long history, tracing at least as far back as Thomas Malthus at the end of the 18th century (Agrawal, 2003). The core of Malthus' (1798) thesis was that since population increases geometrically and resources arithmetically, ultimately populations would outstrip resources leading to a "struggle for existence". "By that law of our nature which makes food necessary to the life of man," Malthus wrote "the effects of these two unequal powers must be kept equal" (p.71). While his "exact formulations" have not been accepted in their entirety by most researches in the 20th century, his work has served as a reference point for the post-World War II debate on overpopulation (Martinussen, 1997).

In the 1950's H. Scott Gordon (1954) wrote: "Wealth that is free for all is valued by none because he who is foolish enough to wait for the proper time to use will only find that it has been taken by another" (p.124). More than a decade later (1968), Garrett

Hardin added to this view claiming that the commons had deteriorated to the point of “tragedy” as “[f]reedom in a commons brings ruin to all” (p.1244-5). Hardin’s essay was based on Malthus’ notion that a growing population would exhaust natural resources and on Darwin’s evolutionary prediction that the characteristics of people who produced offspring would increase over time. Hardin’s argument assumed that the problem was of a social rather than a technical nature and that the solution was to enclose the commons, either through privatization or by imposing government regulations. He also proposed limiting population size, even if this involved coercion (Burger and Gochfeld, 1998).

The degradation of the commons is usually most severely experienced by the poor because unlike the wealthy sectors of developing societies, they get hit harder by environmental degradation and destruction as they have no other recourse. Furthermore, since the poor have little impact on government decision making, politicians are often insulated from their own poor environmental decisions (Blaikie, 1985).

Some critiques of the so called “tragedy of the commons” focus on the fact that it is largely a foreign idea forced on other cultures by the West. Esteva and Prakash (1998) argue against enclosure of the commons on the basis that the commons serve to bind people together, not through the “abstract notion of rights”, but through a sense of belonging and obligation to those with common ways (p.159). Mies and Bennholdt-Thompson (1999) add to this perspective by contending that neoliberalism is an effort to break down the commons in order to seize the resources of the developing world for the benefit of rich countries in the West. These kinds of criticism fall into a general category typical of the anti-globalization movement.

But other critiques have been more focused on the question of the commons itself. Bromley (1989) for instance, has suggested that the conclusion drawn that the

management of the commons can only be achieved by a central authority such as the state or through privatization is false. As a result, Blaikie's (1985) research has shown that when small-scale users begin to experience problems such as land-degradation, the state will often intervene with institutions, such as watershed management committees. However, these attempts often fail because of conflicting interests, the state's ignorance of local conditions, and because of "the overriding concern of government to increase control over peasants in the name of development" (p.147). On the other hand, privatization does not resolve the problems associated with the commons either. It only forces the poor to over-exploit what few resources are left them, resulting in further environmental degradation and further impoverishment of those dispossessed of their livelihoods (Martinussen, 1997).

Bromley (1989) has argued convincingly that such approaches have been based on an erroneous understanding of common-property. He suggests that, beginning with Hardin, many scholars and policy makers have not distinguished between common-property and open-property resources—a misconception carrying serious implications. He also suggests that Hardin mistakenly presented his thesis in terms of a prisoner's dilemma whereby those dependent on a common-property resource are unable to communicate with one another. This, he suggests, is clearly a mistake as community members would most definitely be in constant communication with one another, especially in circumstance where their livelihoods are concerned.

The research of Robert Wade (1988) on irrigation systems in Southern India, demonstrates that there are various methods for managing the commons, apart from the state-run or private property approach. Elinor Ostrom (1990) has drawn a similar conclusion and proposes an alternative approach, which sees co-operative contracts

adopted via pre-determined agreements, that are decided upon by the actors themselves and to which all participants and beneficiaries are bound. Such contracts, Ostrom believes, would have to be equally beneficial in order for them to be agreed to by the actors. Another very important work is that of Baland and Platteau (1996), who attempt to reconcile the vast literature that has been produced on the commons from various perspectives that have drawn varying conclusions.

These are three of the most important studies on common-property resources and between them, thirty-six important conditions are identified by the authors for the successful management of the commons. Only a dozen of the thirty-six conditions are common across all three studies. In Agrawal's (2003) view, the sheer number of seemingly relevant conditions poses the greatest challenge for developing a method to determine the potential success for common-property management as there is no "reliable way to assess the degree of correlation among these factors" (p.254).

Penn (2003) suggests that another obstacle is that scholars have refused to incorporate advances in evolutionary theory into the debate on the commons. Environmentalists and social scientists have mistakenly assumed that theories of evolution always conclude that human beings are naturally egoists that will not cooperate to find solutions to social problems, and that evolution can therefore provide no insight into halting the degradation of natural resources. However, he argues that this is not the case, and that any solution to managing the commons will have to take evolutionary perspectives into account because it helps us to understand *why* we are consuming resources at such a rapid rate. He therefore concludes that any solution will have to go with the grain of human nature rather than against it, as environmentalists mistakenly assume.

When discussing the commons, there are certain distinctions that always have to be made for the purpose of clarification. First of all, we have to distinguish if we are talking about a global commons such as oceans, air or the ozone-layer, or a local commons such as the management of a local aquifer, irrigation system or forest. We also need to distinguish between the four types of property regimes: (1) state property; (2) private property; (3) common property and; (4) open access (Burger and Gochfeld, 1998). While state and private property are quite clear, there has often been confusion between common property and open access. Common-property implies that there are rules that regulate who can use the resource, what areas are considered to be common, and also when a resource can be used. Open-access is essentially considered to be a free-for-all where the rules of common-property simply do not apply and one is free to take what s/he wants. Finally, Baland and Platteau (1996) distinguish between three modes of managing the commons: private, public or state, and community management. While they acknowledge that this is a crude framework that does not always recognize the possibility of mixing and matching modes, they still see it as having value when one is comparing competing modes.

VIII Water and Development

The natural process by which water is purified and redistributed to the earth's biosphere is known as the water cycle. Solar energy is the ingredient that makes the water cycle operate by evaporating water from land and the ocean and spreading it over different parts of the planet. Water circulates through ecosystems, transporting nutrients and creating chemical communication while at the same time cleansing them in order to

ensure they operate optimally. Natural water renewal rates vary substantially from days to hundreds or even thousands of years. In the case of deep aquifers, if they are drained they cannot be renewed at a rate that is of any use to human beings, and if water is consumed at a faster rate than it can be replenished naturally, the planet will eventually run out (C.E. Hunt, 2004).

Of the total planetary body of water, only 0.01% is actually potable and while this minute quantity is constantly being replenished by precipitation, much of it is contaminated on its way back down as a result of pollution. While in theory there is enough fresh water on the planet to sustain 20 billion people, due to the fact that water supply and population are unevenly distributed, some countries are water-rich while many others are water-poor (Maurits la Rivière, 1989: 80). The global supply of renewable freshwater is about 7,400 cubic meters per person but periodic water stress results when the rate falls below 1700 cubic meters (Serageldin, 1995a: 221-8).

A country or a city can experience severe problems getting industry (both national and multinational) off the ground if it does not have sufficient access to water. For example, Kenya's third largest city Nakuru has reportedly lost out on many investments due to poor water supply (Segerfeldt, 2005). Moreover, many industries require water in its purest possible form, which requires a great deal of water that could otherwise be used for drinking (Black, 2004).

In countries where industrialization is on the rise pollution is as well, and concern for the former often takes precedent over the latter. Contamination of groundwater by arsenic and fluoride as well as man-made pollution from agriculture and industry which cause herbicides, hydrocarbons, and pesticides to contaminate fresh water supplies is a growing concern from the United States to Mongolia (Godfrey, 2005). Groundwater can

become polluted in many different ways, such as sewer leakages or runoff from agriculture or paved surfaces as a result of urbanization. While the pollution of rivers and lakes is potentially reversible, groundwater pollution is not (Maurits la Rivière, 1989), and although properly functioning ecosystems have the ability to cleanse the water we drink, they are becoming over-taxed. For example, wetlands are capable of removing excess nutrients from sewage runoff, thus protecting ecosystems further downstream, but if runoff is excessive waste treatment technologies are required to restore the balance (WHO, 2005).

Water quality is of special concern because of the severe toll that poor quality drinking water takes on the lives of people in developing countries. Asit Biswas (2005) of the Third World Centre for Water Management believes that any future water crisis is more likely to be the result of quality than scarcity. Although for many years it was difficult to prove empirically, it has generally been assumed that access to clean water and sanitation has contributed more to general human health and the lowering of infant mortality than any other single factor in history; including vaccines and antibiotics (Ohlsson, 1999). However, in recent years an effort has been made to calculate the impact by such groups as the World Health Organization's (WHO) Health and Environment Linkages Initiative (HELI). The WHO (2005) calculates the global death toll from water-associated infectious diseases at 3.2 million/year, or 6 percent of all deaths globally (p.14). The Pacific Institute's Peter Gleick (2001) paints an even bleaker picture concluding that water-borne diseases such as cholera and dysentery are on the upswing in the developing world, resulting in some five to ten million deaths annually. Billions more become ill every year.

Water related illnesses result in tremendous economic consequences because for the poor, their bodies are their most important asset. A slogan that appears on posters of the Self-Employed Women's Association (SEWA) sums it up nicely: "OUR BODIES ARE OUR WEALTH". A significant proportion of the work in which the poor in developing countries are involved is physical labour, meaning their bodies are what earn them a living. When they become ill, their bodies quickly turn from asset to liability (Chambers, 2007). Estimates at the global level, put the cost of water-related illnesses at some \$150 billion dollars annually. As a lack of access to potable water results in sickness, which prevents adults from working and children from attending school, the workforce in developing countries is weakened. However, investing roughly two-thirds of this amount into providing clean water and sanitation could rectify the problem. This is why Rothfeder (2001) has argued that the economic and social costs of not providing universal access to potable water are actually higher than doing so would be (p.94-5). The UNDP (2006a) goes even further than this, claiming that for every \$1 spent on water and sanitation, \$8 is gained in "costs averted and productivity gained". "Can the world afford to meet the costs of accelerated progress towards water and sanitation provision?" the UNDP asks. "The more appropriate question is: can the world afford *not* to make the investments?" (p.6; 8, original emphasis).

In the developed world we seem only dimly aware of how access to clean water and sanitation has improved our quality of life. Little more than a century ago in major centers like London, Paris and New York, infectious disease was rife and child mortality rates were as high as they are in Sub-Saharan Africa today. Although economic expansion was on the rise in these countries, life expectancy and child mortality had barely improved. This all changed with sweeping reforms in the water and sanitation

sectors. Within a generation, the regulation, finances and infrastructure were put in place to bring water and sanitation within the reach of all and the link between dirty water and infectious disease was broken. By some estimates, access to clean drinking water could explain almost half of the reduction of mortality rates in the United States in the first third of the 20th century, and sanitation led to an increase in life-expectancy of some fifteen years in Great Britain in less than a half-century after 1880 (UNDP, 2006a: 5). Access to potable water and sanitation could have a similar impact on developing countries, propelling them out of poverty.

The year 2005 was a benchmark year for water and development as it marked the beginning of the “Water Decade”. Access to potable water is widely recognized as an important component to relieving poverty but it is only now beginning to reach a boiling point in the development debate, despite the fact that it has been well known for some time that many parts of the world are facing an ensuing water crisis.

While it is indisputable that access to potable water is one of the most basic human necessities, how best to provide it is not so clear cut. The water and sanitation services of most of the world’s diverse nations are primarily provided by the state and this has resulted in varying degrees of success and failure in the developed world, but in the developing world—for a variety of reasons—state provision of this basic service has not proved very successful.

IX Key Issues

Three key issues have been introduced to analyze the water problematic in this study: 1) access; 2) control and 3) distribution. In this section, we will look at these three issues in further detail.

Access

In order for there to be access to potable water it must be available to one extent or another. The source may be a tap in your home that supplies water from a local lake, river or aquifer, or it may come from another location through a tap or by a water truck. Whether or not water is controlled privately, by the state, or locally by communities, there needs to be access to one degree or another to begin with.

Who controls water resources in the first place will play an important part in determining the extent and quality of water infrastructure. We can ask if the infrastructure in place at any given place and time is good enough to create the necessary access and distribution; does it reach the population that requires access or is much of it lost due to leaky pipes? In developing countries, water infrastructure has still not been developed to the same advanced level as they are in developed countries (Biswas, 2005), in many countries, as much as 75% of piped water is lost to leakage and evaporation (Brooks, 2002). Black (2004) points out that government in developing countries have a notoriously poor record of providing public utilities, but we are also reminded by the UNDP (2003) that private water companies usually have little interest in providing services in rural areas because there is little profit to be made. This creates serious obstacles for those considering either market or state control as the best means of providing access to potable water.

The role of women and children is a key component to creating access to potable water. As gathering water is usually seen as domestic work, the burden of providing water for the household usually falls squarely on their shoulders. According to the Sustainable Development Network, around the world women and girls are estimated to spend 10 million person-years annually collecting water (see Segerfeldt, 2005: 9). However, they also manage water for such productive purposes as home-gardening and animal husbandry. But despite their invaluable contribution, it is uncommon for women to have equal rights to water and land (Rijsberman, 2003). Many children in developing countries miss out on educational opportunities because they are responsible for such household chores as water collection. This responsibility is especially burdensome for young girls who are more likely to be assigned such domestic chores than their brothers. Throughout the world this has led to a great incentive for women to take part in the creation, implementation and management of local water projects. Direct household water access frees up a great deal of time for women and allows them to spend more time on other tasks that would otherwise be spent fetch water (Rothfeder, 2001). It also means they have to spend less time and money on children that have fallen ill from water-borne diseases.

Geography is also a very important component of the discussion. Many communities and cities are in geographically strategic regions that benefit from access to potable water. A city or community may be located in a region with one or several major rivers running through it and may also enjoy a high level of rainfall, which ensures the rivers keep flowing at a sufficient level, while another city or community is located in an arid region with low rainfall and a poor river network to supply its water needs. This community may be required to import water from other parts of the country or may

simply have to go without sufficient access to water (Anton, 1993). Variations in water supply are much greater at the international level. While 25 percent of global runoff occurs in South America—80 percent of which comes from the Amazon, or 20 percent of world total—Europe accounts for just 7 percent and Australia for a mere 1 percent. Because water is spread so unevenly, it is very difficult to compare water scenarios between countries. So while water stress is certainly a global issue, local analysis is essentially the only approach that makes sense (Ohlsson, 1999: 6).

Another factor is the level of deforestation a particular region has experienced, because high levels of deforestation make it difficult for water catchments to retain water. Forest canopies serve as natural dams by absorbing rainfall in their roots and in the mushy forest floor. Moisture is then slowly released into the atmosphere, or into local streams and aquifers (Black, 2004). Deforestation destroys this natural process resulting in rapid runoff into rivers, flushing fresh water out into the ocean where it mixes with salt water and becomes unsuitable for human consumption. At the same time, it can also create destructive floods.

Control

When discussing the issue of control of potable water we are presented with four options: state control, market control, community or local control or alternatively, a combination of private/state run water delivery known as public-private partnerships (PPP). These are essentially the same modes available for managing the commons, and we shall review each one in succession.

State Control

State control of water resources is the most common approach to water resource management, and in developing countries, 97% of all water distribution is managed by

public suppliers (Segerfeldt, 2005: 1). Those who promote the use of state owned enterprise (SOE) often claim that only the state can offer public services like water delivery because where concerns of private economic gain come into play, public interest is pushed to the side. Moreover, governments are often seen as a source of legitimacy (Molle, 2004). Governments are prepared to offer public services in areas where companies would otherwise not go because profits would be too low or might in fact force the company to operate at a loss (UNDP, 2003). This would be especially true in the countryside where populations are sparse and the level of poverty is often greater than in urban areas.

Opponents of the state option point to “state failure” and the ineffectiveness of governments “to integrate sectoral policies and practices related to the management of water resources” (Rijsberman, 2003: 406). They also contend that governments impose rigid structures in situations where they may not be pertinent and are unable to take into account important local variables which may seriously affect access and distribution to water. Ultimately, what Elinor Ostrom suggests is that “the worst of all worlds may be one where external authorities impose rules but are only able to achieve weak monitoring and sanctioning” (Ostrom in Molle, 2004: 222).

Critics also contend that a slow procurement system in SOEs result in inefficiencies because they become overstaffed for political reasons, they are unable to attract the most qualified people due to uncompetitive salaries, and that expansion and improvement of services are limited by financing difficulties (Inocencio, 2003). The World Bank (2003) points to a more pernicious result still: patronage politics. It suggests that in such situations, providers end up being more accountable to policy makers than their clients. The way to make providers more accountable to clients, the World Bank

argues, is to separate the providers from the policy makers. In conclusion, what in the past had been regarded as the governments role has been increasingly challenged from various perspectives.

Market Control

Many experts strongly believe that market mechanisms are the best way to avert any future water crisis. They also believe that it is the fairest way to deal with issues of access and distribution because subsidized water does not recognize its full value, leading to massive waste that severely exacerbates environmental degradation. By privatizing the water industry, it is believed that making customers pay for water on a system of demand and supply will force them to realize that water has an economic value and that higher prices will ultimately lead to conservation out of economic concerns and in turn relieve the world's water stress (Raines Ward, 2002 and De Villiers, 2001). "At higher prices" write Anderson and Snyder (1997) "people tend to consume less of a commodity and search for alternative means of achieving their desired ends. Water is no exception" (p. 8). Some experts claim that a mere increase of 10% in water prices results in a consumption drop of 15-20% (De Villiers, 2001: 304). They argue that since private companies are in the business of providing public services, they will have a stronger interest in ensuring that the delivery of water will be of the best possible quality and ensure that infrastructure does not fall into disrepair (Segerfeldt, 2005). Furthermore, privatization proponents argue that since the poor are often not hooked up to a water network, it is not they who are benefiting from subsidies but the middle class and economic elite (De Villiers, 2001 and Raines Ward, 2002). A study of six Central American cities concluded that it is primarily the wealthiest 60% of the population who are reached by government subsidies (Segerfeldt, 2005: 52).

Serageldin claims that from any perspective, global water management is not sustainable for four principle reasons: 1) most countries do not treat it as an economic good meaning that “low-value users” are able to consume large quantities leaving “high-value users” to incur the costs of shipping from long distances and resulting in unreliable services due to a low willingness to pay; 2) government agencies which are overstretched and lack proper incentives are too heavily relied upon for water provision; 3) water provision is too fragmented between sectors and institutions without taking into consideration potential arising conflicts and; 4) neglect of health and environmental issues is leading to severe illness. Furthermore, an exploding population—most of which is taking place in urban areas—is exacerbating the problem tremendously (Serageldin, 1995a: 221-8). In short, market mechanisms for water follows the same line of thinking as any other private sector service. If it is controlled by the fee-market, economic competition will ensure that you get the best quality service at competitive prices.

Gleick counters this argument, pointing out that the evidence shows that in reality, water privatization is actually about long-term monopoly contracts, which eliminate the competition aspect of the market. Gleick adds that since privatized water industries are often run by foreign multinationals, profits leave the community and likely, the country as well, instead of being reinvested in local and national economies (Gleick in Luoma, 2004: 57). Furthermore, Uwe Hoering (2002) argues that there is no empirical evidence that private enterprise is more efficient than public enterprise; either at reducing loss of water or in creating more sustainable use of water resources. Sjölander Holland’s (2005) claims that what recent history shows, is that when private industry takes over water services, it is usually introduced with great fanfare and promises of massive investment and

improvement. “However,” she writes “something usually happens to derail the plans, and changes to the contract or agreed schedules follow” (p.82).

Finally, C. E. Hunt (2004) claims that it is extremely difficult to determine the economic value of water because it means different things to different people in various parts of the world. In the developed world, fresh water might be valued because it creates the opportunity for sport fishing, which can lead to income generation. In a developing world context, fish living in fresh water may provide people with the protein they otherwise could not get. “Broadly speaking, attempts to estimate the value of freshwater ecosystems are moot and essentially a waste of good research money”, claims Hunt. “The earth’s living components produce the air we breathe and the food we eat. They are, therefore, indispensable”. Furthermore, in economic terms, she suggests that a value cannot be put on water since it is not like other resources such as oil or coal because it has no substitute. The only alternatives to the natural water cycle are the extremely expensive technological approaches such as desalination and reverse osmosis (p.30-2).

Community/Local Control

Decentralization has been popularized in recent years because it is seen as a way to make government less prone to corruption and less expensive while at the same time deepening democracy. Many also believe that public participation in decision making is good in-and-of-itself because it can improve resource management, efficiency, equity, and development more generally (Brannstrom, 2004). It has been advocated from a variety of perspectives including academics, NGO's, and even multilateral institutions such as the World Bank. Decentralization can take various forms, but the one with which we are concerned here is that of community or local control of water resources.

Those who propose a community/local control approach to water resources management often argue that water is a part of the commons and that the only way to ensure autonomy in a commons is through community control. Social control of water delivery is believed to be fundamental in order to provide a reliable supply of water to the community (Tortajada, 1998). This approach often advocates the use of small-scale projects, which are often based in local knowledge and small-scale or intermediate technology. Sandra Postel (1992) claims that in recent years, these projects have experienced far greater success than unmanageable large-scale projects. Local knowledge is advocated because it is assumed to be based on meeting the needs of the community rather than being wasteful as large-scale water delivery systems often are. Furthermore, it is more likely to conform to the requirements of local ecosystems and thus, more likely to promote conservation of the environment. David Brooks (2002) contributes to this perspective, arguing that local-level management is “essential to the sustainable exploitation of scarce water supplies”. He claims that this is because in many countries there are no more rivers to dam, aquifers are being exhausted and expansive irrigation systems have reached their limits. Furthermore, he claims that these projects increasingly expensive and environmentally destructive. The best hope for averting a water crisis, community advocates claim, is through conservation. “A water – management project should lean toward increasing the efficiency of water consumption rather than toward increasing the supply of water” warns Maurits la Rivière (1989), as “to increase the supply is often more costly, and in any case it merely postpones a crisis” (p.92).

The community approach rejects the notion that placing water on the market like a commodity is the best way to promote conservation, pointing out that market survival is

dependent on mass-consumption and waste. Since markets are based on growth, corporations would be forced to propagate mass water consumption patterns as their very survival depends on the quantity of water they can sell. Shiva (2002) argues that water has traditionally been considered to be a natural right evolving out of the “ecological context of human existence” and not the state. Early riparian principles she argues, were not based on property rights but on the notion of sharing and conserving water. She argues that the market approach does not promote conservation but will likely lead to waste, while the poor pay the price. Furthermore, in cases where water is controlled by outside interests, there is no incentive for communities themselves to conserve water because the external interests are the only ones that would benefit from their efforts. Shiva concludes that the only viable option for water management is through a decentralized democratic process. She justifies this on the principle that water is a moving resource and therefore, cannot be considered the property of any given individual. Finally, she believes that the only way to promote conservation is at the community level because they are the only ones who will bear the direct consequences of its overexploitation.

Opponents question the interpretation that communities are homogeneous units. On the contrary, they see communities as being rife with competing and contrary interests, which can stifle the cooperative process (see Agrawal and Gibson, 2004). Leach, *et. al.* (1997) also dispute the perspective that communities were, at one time, homogeneous in nature but were disrupted along the way by inappropriate state policies, population growth, or the breakdown of traditional authority. While they do not see this interpretation of community control as being of “no value from a policy perspective”, they do see it as being “basically flawed” (p.5).

One of the major challenges a community controlled water system would face is how to regulate the system, and who would be in control of regulating. For instance, Brannstrom (2004) questions whether water should be regulated by a single issue group-an organization which solely concerns itself with water-or a multi-purpose group-an organization which concerns itself with several issue areas. Brannstrom argues that multi-purpose groups are preferable as single issue groups are often appointed rather than democratically elected, they are unaccountable to the local population and are also more susceptible to top-down intervention. Therefore, he concludes that as single issue groups are “potentially damaging”, they should be subordinate to multi-purpose groups (p.215).

Public-Private Partnership (PPP)

Public-Private Partnership (PPP) is an approach that has been advocated in various circumstances around the world from developing countries like Congo, the Philippines, and Yemen, to major cities in the developed world such as Atlanta, GA (Hoering, 2002).

“PPPs are assumed” writes Gabriel Tati (2005) “to combine the advantages of the dynamism, access to finance, knowledge of technologies, and the managerial and entrepreneurial spirit of the private sector with the social responsibility, environmental awareness, local knowledge, and job-creation concerns of the public sector” (p.317). In Arlene B. Inocencio's (2003) view, the increase in the various partnerships in water services makes water provision the responsibility of many actors, benefiting the poor. Anwer Sahoo (2003) adds that the reason for bringing the private sector into a PPP arrangement is that a private operator should already have sufficient experience to offer “quick and appropriate solution” that will benefit consumers; the private sector should be able to help governments co-finance water sector investments in the future; improved

services and reduced costs should result from competition with other government service providers and; inclusion of the private sector will make governments more vigilant about the relationship between pricing and service quality by separating the two.

Sahooly identifies six approaches to PPP (p.145):

- service contracts;
- management contracts;
- lease contracts;
- build, operate and transfer or build, operate and own, and;
- complete sale of assets (divestiture)

In order to work properly, Tati (2003) contends that: “PPPs must take into account the economic and social impacts of diverse consumption patterns, and they must also assess consumers' needs. Being able to do this depends on a clear definition of roles and responsibilities and the recognition and mitigation of financial risks” (p.323). Tati adds that risk transfer is also essential to the success of PPPs. Therefore, bidding for contracts must be conducted in a competitive atmosphere and private enterprise must not be allowed to operate as a monopoly or near monopoly, as this would influence efficiency considerably.

However, there are also many arguments against-or at least reservations to-the PPP approach. Uwe Hoering argues that PPP is usually forced on governments rapidly and that their negotiating ability is relatively weak *viz. a viz.* powerful private industry, and therefore, they are unable to incorporate their social and ecological concerns into an agreement. The PPP approach often denies the public sufficient participation in the process and in many instances, also leads to price hikes. Hoering (2002) adds that many people are often excluded from the benefits of PPPs because the private sector only

operates where there is sufficient profit to be made. Furthermore, it allows private corporations to use water delivery systems, paid for by the public, for free while at the same time it offers no solution to the question of water stress and environmental degradation. Despite a great deal of fanfare by many aid agencies, the UNDP (2003) has observed that in reality the PPP approach has tended to work best when the previous system was working effectively to begin with, and not so well when it was not.

Distribution

This brings us to the third issue of distribution. No matter how much or how little water people have access to or how it is controlled, how it is distributed is a very important issue. Water can be distributed for a variety of uses, including for drinking, industry, or agriculture. Only about five percent of water all the water we consume is used for household water requirements (UNDP, 2006a: 2), but a full ninety-two percent is used for economic activities (Libiszewski, 1999: 115-6). Agriculture takes up a considerable proportion of this. As much as a hundred times as much water is needed to grow our food as is needed for drinking. Of all the fresh water used around the world, irrigation takes up about two-thirds of the total (Brooks, 2002). A significant amount of water is also distributed for industrial purposes.

Another question is whether or not potentially potable water is actually distributed for any of the above-mentioned functions or if it is simply used as a dumping location for manufacturing plants or for sewage disposal. In Latin America, ninety-eight percent of household sewage goes directly into the nearest river with no treatment whatsoever (Black, 2004: 24). This plays a considerable role in determining the quality of drinking water. It also leads to a number of sub-issues such as health and disease. A village may

be located by a river, but if that river is infested with cholera or schistomiasis, chemicals or heavy metals, it is useless as a source of potable water.

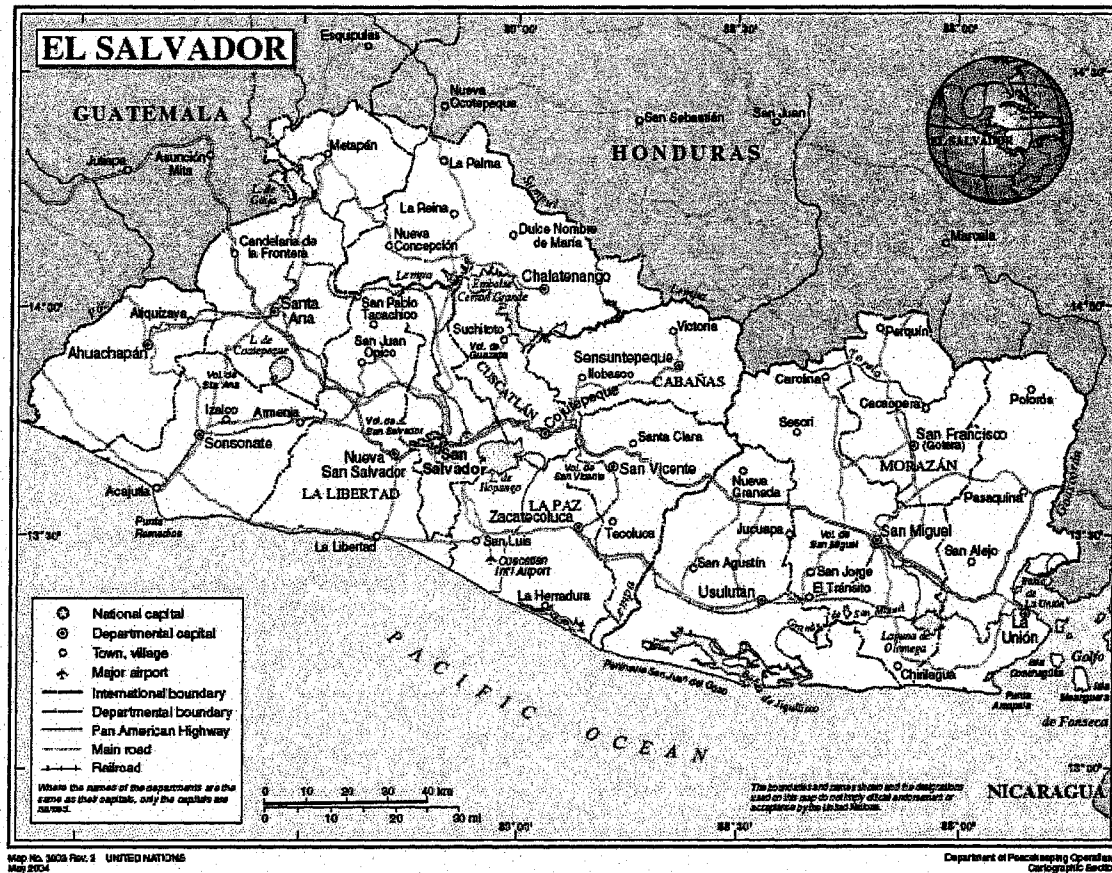
Another consideration when discussing distribution of potable water is that of population; the larger the population, the more the source of water is likely to be contaminated and overexploited. Marq de Villiers (2001) points out that since the populations of countries like Sri Lanka and El Salvador are declining, they are in a better position to deal with water stress than other countries. However, since worldwide water consumption is increasing at double the rate of population growth, we should not be overly optimistic about this point (Mander, 2003).

There are a variety of causes for the disparity in water distribution and consumption in developing countries. Two of the most important examples are that of the disparities between urban and rural settings and another is the disparity between economic groups. Disparities in water consumption in the developing world are tremendous and growing. While the high income areas of cities in the developing world use several hundred litres of water per day, those living in slums and in rural areas get much less than the minimum 20 litres/person/day required to meet basic human needs. In fact, most of the 1.1 billion people lacking access to water around the world use as little as 5 litres per day. This is only a tenth of what is used to flush a toilet in the developed world, and less than the amount lost to leaky pipes. Furthermore, not only do these wealthy urban people have access to copious amounts of clean water, it is also pumped directly into their home by public utilities at low (often subsidized) prices. "The perverse principle that applies across much of the developing world" the UNDP (2006a) reports, "is that the poorest people not only get access to less water, and to less clean water, but they also pay some of the world's highest prices (p.5-7).

Chapter 3—Case Study

I Introduction

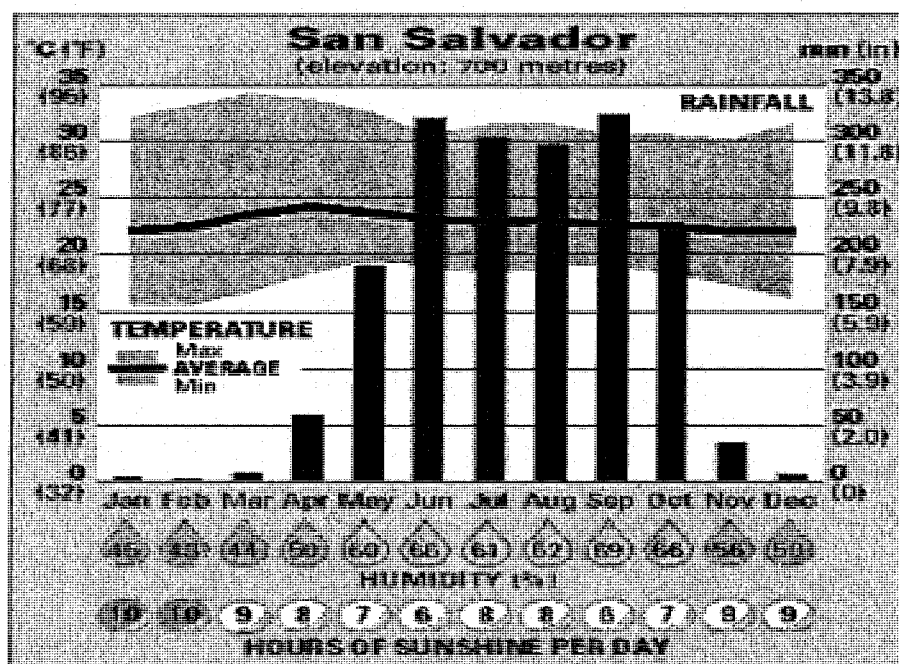
The first section of this chapter will provide an overall picture of the potable water problematic in El Salvador. We will review data on the environmental, social and economic aspects of the country's predicament and will consider the institutions impacting the country's water resources and the history behind them. The second section will address similar concerns as the first, only in a rural context. The third section reviews the relevant data on the rural community of Delicias in the municipality of Santa Cruz Michapa, located in the department of Cuscatlán. This community was the primary focus of my fieldwork in El Salvador from October 2005 to April 2006. The first and second sections are intended to provide the context for the third section, and the recommendations presented in the fifth and final chapter of this study, will therefore primarily focus on Delicias rather than the country as a whole.



II Background on Water Resources in El Salvador

El Salvador has a land mass of 20,720 Km² with a population of approximately 6.9 million people (CIA, 2008), making it the smallest and most densely populated country in Central America. The country is rich in water resources due to its mountainous topography and a good rain regime (Barry, 1994). It has some 360 rivers grouped together in ten hydrographic regions (MARN, 2002). The largest river basin is the Lempa River and extends through 49 percent of the nation's territory, or a total of 10,000 Km²; this is followed by the Grande River, which covers 2,250 Km², the Jiboa

River (1,717 Km²), the Guascoran River (1,316 Km²), and the Paz River (958 Km²) (IA 2015, 2006: 11).⁹



As in any country, El Salvador relies on the water cycle for its drinking water. It is estimated that local hydrological recharge from precipitation averages approximately 2 billion m³/year (UNDP/PNUD, 2001b). Unlike Canada, El Salvador goes through only two seasons: the rainy season from May to October accounts for roughly 95 per cent of the country's annual precipitation, and the dry season from November-April accounts for the rest. Rainfall in El Salvador ranges between 1,500 and 2,300mm annually¹⁰, a volume that is approximately three times the world average (UNES, 2005: 7). This translates to roughly 57 million m³ of rainfall every year, although only 21 million m³ can potentially be accessed due to evaporation of water into the atmosphere and the runoff of one-third of total rainfall directly from the rivers into the ocean (UNDP/PNUD, 2001b). Nevertheless,

⁹ IA (Iniciativa Agua) 2015 is an initiative made up of different Salvadoran and international organizations, including the UNDP, the Global Water Partnership, RAISES, and the Comision Nacional de Desarrollo.

¹⁰ According to the UN (2008) Guatemala receives 1,186mm and Honduras receives 873 mm/year. Canada itself receives 832 mm/year.

there is no absolute shortage of water in El Salvador. “Given the topographical, climatic, and ecological characteristics of El Salvador,” Barry (1994) writes “the entire country is practically a water basin” (p.6).

Yet, there is a paradox. A country that relies on less than 5,000 m³ of water per person/year is considered to be water stressed, and with a per capita annual availability of just 3,125 m³, El Salvador finds itself in that category (CESTA, 2005: 11). This raises a central question: How is it possible that a country with three times the world average of rainfall finds itself in a situation of water stress? The answer, according to the Unidad Ecológica Salvadoreña (UNES—Salvadoran Ecological Unit, 2005), is the national development model pursued by El Salvador over the past two centuries. This model, which until recently predominantly emphasized economic growth through commercial agricultural export, has resulted in the wasteful exploitation of the country’s water resources as a consequence deforestation, pollution, and unmanaged urbanization and which prevents the water cycle from functioning properly.

Deforestation in El Salvador has a long history. Large forested areas in the country were initially cleared to make room for indigo plantations. Around the middle of the 19th century additional tracts were cleared, first for coffee crops, and later cotton. Today, even as El Salvador becomes increasingly urbanized and service sector driven, intensive cropping for export continues to play a leading role in the rural and national economy (Ibarra interview, 1 March 2006). The deforestation caused by commercial clearing has been further compounded by poverty, forcing many people throughout the country to rely on the use of firewood because there is no alternative source for cooking and heating for the poorest (Gomez interview, 3 March 2006). By the turn of the century, the Ministerio de Medio Ambiente y Recursos Naturales (MARN—Ministry of the

Environment and Natural Resources, 2000) reported that as little as 0.5 per cent of the country's original primary forest remained (p.iii).

Pollution has intensified the water crisis, rendering much of the available superficial water unsuitable for human consumption (Aguilar Molina interview, 23 January, 2006). The pollution that makes its way into the country's water supply comes from a number of sources, including chemical runoff from export agribusinesses, like sugar and coffee plantations, and other forms of industry (UNES, 2005). Hydro-electric dams, such as the Cerron Grande on the Lempa River, also contribute considerably to the problem, in addition to affecting the river's natural flow (Aguilar Molina interview, 23 January 2006).

Pollution of El Salvador's water supply is also tied to the absence of services. Contaminants in water derive directly from household sewage systems, as well as from people either openly burning garbage or tossing it into the open and leaving it to run into local streams and rivers (UNES, 2005). Adding to the problem is the fact that only about two per cent of the country's water receives any type of treatment whatsoever. Aguilar Molina adds that as rivers pass through cities, they collect a great deal of garbage, and contaminants. Finally, some rivers that pass through El Salvador such as the Lempa are trans-boundary rivers meaning that they are also polluted by neighboring Guatemala and Honduras. (Aguilar Molina interview, 23 January 2006).

Together with the over-use of agro-chemicals in export agriculture, deforestation has contributed immensely to soil erosion (Barry, 1994), a problem that has been recognized in El Salvador since the 1950s (Aguilar Molina interview, 23 January, 2006). Silvia de Larios (interview, 20 January 2006) explains that because of this soil erosion there is less underground water to access either superficially in wells—where many rural

people obtain their water—or deeper underground in aquifers where many urban residents obtain their water. Furthermore, as a result of the mutation of the country's water cycle, an ongoing decline has been evident in the volume of water flow in the country's rivers since the 1970s. During the rainy season average water flow has been diminishing in the first half of the season and increasing in the second half, but resulting in an overall decrease. The effect of water flow in the first two months is most likely related to the change in soil use. "In the first months of the winter," MARN (2002) reports "there is an effect, whereby the superficial layers of the soil become saturated, and then drain off in the last months of the rainy season". Thus rather than being absorbed into the soil and incorporated into the country's natural water cycle, the country's water resources are being repelled, causing destructive flooding and flushing rainwater into the Pacific Ocean (Aguilar Molina interview, 23 January, 2006). To quantify this, an estimated 19 million m³ of potentially potable water is drained into the ocean each year due to environmental degradation (MARN, 2002).

Urbanization is another issue that has caused serious damage to the country's water cycle. Ill-planned urbanization, including the construction of several new shopping malls in Greater San Salvador, have meant that the many of the few remaining natural spaces in the country have recently been paved or covered in concrete. Furthermore, some of this construction has been taken place in important areas for hydrological recharge. Paradoxically, what is happening is that aquifers are not able to recharge, but at the same time there is serious flooding in the city. "On the one hand" Navarro (interview, 3 April, 2006) claims "everyday we have less potable water in El Salvador, on the other hand we have flooding because of the rain... So on the one hand you have shortage, and on the other you have excess, and the reason is because El Salvador's land has been

destroyed and rainwater can't be absorbed, causing floods". The combination of urbanization and deforestation in areas that are particularly important to the country's hydrological recharge has resulted in the destruction of the country's traditional sources of water (IA, 2015).

All told, the loss of biodiversity that has resulted from local deforestation and soil erosion is among the highest on the continent, earning El Salvador—along with Haiti—the distinction of being the most environmentally degraded country in the region (Barry, 1994). For this reason the UNDP (2001b) claims that it is fundamentally important to maintain conditions that guarantee that the country's water is regulated and that it can be taken advantage of, particularly considering growing demand for domestic use, irrigation, industry, and the generation of hydro-electricity. However, at the moment, there is a serious degradation of the country's water resources. Corrective action is extremely urgent, but the government must first confront the serious lack of understanding of the problem and lack of basic information available— both of which are needed in order to protect the water cycle.

III The Beginnings of a National Water System

Social control of water resources in Latin America pre-dates contact with the Spanish. However, after the Spanish invasion a centralized system of control was implemented, remaining in place until approximately the middle of the 20th century (Lee, 1990). During the era of colonization in El Salvador, the Spanish similarly established a centrally-administered water system into in the capital, San Salvador. The first sources of water came from the banks of the Lomas de Candelaria in the community of Montserrat

in San Salvador. In the first decade of the 20th century several new water projects were completed, the most important of which was a plumbing system that had the capacity to manage some 6,000 m³ of water. During this era many of the city's water systems were managed by private companies (CEAA, 2000), but through the 1920s and 30s, the municipalities also began to assume responsibility for local water systems (Larios interview, 20 January, 2006). As a result of the efforts of international development institutions in the second half of the 20th century, Latin American governments throughout the region began to see water as an instrument for the country's economic development (Lee, 1990).

IV Institutional Problems

With Decree No. 341 of the 17th of October, 1961 the Administración Nacional de Acueductos y Alcantarillados (ANDA—National Administration for Aqueducts and Sewage Systems) was created and would henceforth serve as the Salvadoran state's national water and sewage agency. ANDA has subsequently operated as the primary head for water and sewage services of most urban and peri-urban municipalities in the country, except for approximately 72 where to this day, management of the water systems fall under the responsibility of the municipal governments themselves (PAHO/WHO, 2003: 13).

However, since the beginning ANDA has shown that it is incapable of operating the water and sewage system at the national level (Larios interview, 20 January, 2006); and over the last four and a half decades has gained a reputation for its inefficiency and

lack of accountability, evidenced by poor service, poor quality drinking water and excessive fees (UNES, 2005).

One of the main problems with ANDA is that its mandate is too narrow. Marta Lilia Quezada of SalvaNatura (interview, 8 March, 2006), points out that ANDA's responsibility is only for water pipes in urban areas, meaning it is concerned solely with distribution, and not with water quality. Dr. Ricardo Navarro, President of CESTA (interview, 3 April, 2006), adds that ANDA also ignores other critical issues relating to the nation's water supply, such as conservation of potable water resources. "ANDA's philosophy" Navarro argues, "is to take water from wells, and distribute it. Sometimes they clean it, but nothing else... ANDA has never been concerned about the destruction of the river basins or with deforestation... The problem" he continues "is that ANDA looks at water like a mining company. They extract the resource until it's gone". IA 2015 (2006) concurs with this view, concluding that ANDA's approach to water resource management has resulted in a hydrological model that is purely extractive and short sighted.

Corruption has further crippled the potential of the Administration. When ANDA was created it was controlled by the military, which saw it more as an opportunity for personal enrichment than a public institution providing a social service. However, even after the Peace Accords were signed (1992) and ANDA was placed in civilian hands, this process continued. Over the years, there is some evidence that corruption has resulted in the loss of millions of dollars in revenues — the most severe recent example while ANDA was under the control of Carlos Perla (Ibarra interview, 1 March 2006).

Gomez (interview, 3 March 2006) suggests that ANDA is an organization that has been disorganized and drained of resources to the point that it is now incapable of playing

a proper role in the country's water management or of resolving its own problems. She ties this to the manipulation of the agency by those who would like to see it converted into a private company, as was done to the country's pension system, telephone and electrical companies in a wave of privatizations over the last decade and a half. Notably, UNES (2005) has characterized ANDA as a poor example of a public institution that should remain intact (p.44).¹¹

V Water Crisis or Governance Crisis?

There are a number of groups competing for the use of the country's water resources: cities, municipalities and communities, the big users like ANDA, La Comisión Ejecutiva del Río Lempa (CEL—Lempa River Executive Commission), and Ministerio de Agricultura (MAG—Ministry of Agriculture), as well as the big private corporations like Diana¹² and Coca Cola.

Carolina Dreikorn (interview, 22 March 2006), who runs the UNDP's water program in El Salvador, points out that there are five major state institutions that deal with water,¹³ but they do not communicate with each other or share information. They conduct their own studies, but do not share the finding of their studies with other state institutions or with the public. There is also the problem that different institutions are

¹¹ Since ARENA took power in 1989, El Salvador has been one of the most pro-Neoliberal countries in Latin America. Among the industries that have been privatized in recent years is the phone industry and electrical industry. There have also been attempts to privatize the health care system and the National University, but these plans were suspended after very long periods of mass protests. Under the recently signed (2006) free trade agreement between the Central American countries, the Dominican Republic and the United States (DR-CAFTA), El Salvador was one of two countries to allow water to remain within the confines of the agreement. In theory, this means that DR-CAFTA opens the door for El Salvador's water industry to be privatized, providing there is a company that feels it can make such an industry profitable.

¹² *Diana* would be the Salvadoran equivalent to a junk food corporation such as *Frito-Lay*.

¹³ There are actually about twenty institutions that deal with water, but Dreikorn is referring to the five main institutions: ANDA, MARN, MAG, CEL, and MSPAS.

responsible for certain water related activities, but not others. For example, ANDA is responsible for water delivery but MARN is responsible for protecting the resource itself. CEL uses water to generate hydro-electricity, polluting the water supply in the process, but has no dealings with either ANDA or MARN. This creates serious complications.

Furthermore, despite the fact that there are so many different users of water in El Salvador, both big and small, the only existing (general) law regulating the country's water resources is the law that was passed to create ANDA over four decades ago. There is no integrated institution in the country that is specifically charged with managing of the country's water and, although there are various laws and institutional mandates related to water resource management, there is a serious lack of coherence and harmony between them. (UNDP/PNUD, 2001b).

In CESTA's (2005) view, the legal framework related to water in El Salvador remains "too broad and dispersed and there is no clarity as to which one of the competing actors should apply the norms" (p.6). To date there has been no serious effort to develop a national plan or a policy for the integrated management of the country's water resources. Furthermore, the way in which water is used and the quotas assigned for such uses are arbitrary and short-sighted and primarily benefits the country's powerful economic and political groups (UNES, 2005).

Magno Sandoval (interview, 4 April 2006), a Salvadoran lawyer who has worked on water issues for decades, recalls that the first of several attempts to establish a comprehensive legal framework surrounding water in El Salvador was a UNDP sponsored effort in the early 1980s. But it failed along with a number of successive legislative efforts that were never implemented. Sandoval argues that there have been several issues preventing the establishment of a useful water law in the country. In some

cases it is because powerful economic groups, such as industry, do not want to have their water use limited or their costs increased. In other instances progress has been blocked by environmental groups opposing actions they fear will result in privatization of the country's water services. But one of the biggest obstacles, he maintains, is purely political and is the result of the absence of a "constructive political system".

Thus, while there have been different water laws tabled in the National Assembly over the years, their failure to pass has largely been due to divisions between political parties and opposition, not to the quality of the proposed law, but to supporting the agenda of another party. This competition also plays out at different levels of government. For example, if a local government is represented by a different party than the one at the national level, any effort by the national government will be opposed at the local level, and vice versa. "So now," Sandoval soberly points out, "we have no law, and that means there are no obligations. There is no law and no institution to fix the problem".

This divisive political mentality has also managed to seep into Salvadoran society. Quezada (interview, 8 March 2006) observes that since the Peace Accords were signed the polarization of politics has played itself out at the ground level in communities where different groups affiliated with particular parties won't work together. This is true even of the Asociaciones de Desarrollo Comunal (ADESCO—Communal Development Associations), which carry out so many important social functions in communities, but are often dominated by one political party. These divisions have introduced serious obstacles to local development.

This has led Cuellar and Larios (2001) to conclude that in reality, the water crisis is actually a crisis of governance, and is the result of the failure "to integrate policy and

practice as they relate to the management of water resources” (p.2). Gomez (interview, 3 March 2006) concurs, arguing that the overall problem of water management in El Salvador goes beyond ANDA and is ultimately the result of a lack of political will on the part of the government to deal with the country’s water problems. She suggests that what is needed for the country to “get its house in order”, is a law that organizes the various uses of water, and the various institutions that use it.

VI Rural Services

In many countries around the world, both rich and poor, services in rural areas are worse than in urban centers. There are a variety of reasons for this. In some instances, it is simply because populations are sparsely dispersed, making it more difficult and costly to offer public services. In other rural settings it is difficult to attract professionals, especially young professionals, away from the cities where they are used to living and into the more traditional and challenging country life.

However, in the developing world rural areas are particularly notorious for their lack of services and poor conditions. This is quite evident in El Salvador, where according to a study by FUSADES (2001), the average rural Salvadoran lives 5 km—or 33 minutes walk—from the closest highway. The distance for the countryside’s poorest is even greater, at 7.4km (p.5). This means that rural people live from 5 to 7.4km away from the closest services, be it access to medical services, access to water trucks where many rural people get their water, or simply access to buses that will take them to the closest town.

In Latin America, urban populations have very much adopted an “out of site, out of mind” attitude toward the plight of the rural poor (Ruiz, 2001).¹⁴ Even in cases of extreme suffering, as during the recent civil wars in Central America or the ongoing conflict in Colombia, urban residents seem to be all but indifferent to the suffering of their poor rural countrymen and women.¹⁵ However, at times treatment of the rural poor by the state and the economic elite is much more pernicious. The management of the Salvadoran commons for cultivation of coffee is one such example.

By the middle of the 19th century, coffee was becoming El Salvador’s most valuable crop. However most of the best lands for coffee production were communal, or *ejidal* lands. The Salvadoran state quickly intervened—as the government and the elite were often one and the same group—decreeing in 1856 that two-thirds of all communal lands would be reserved for coffee production or would revert to state ownership (D. Mason 1986). In the 1880’s the state stepped up its efforts by prohibiting traditional collective ownership of lands, which had been the basis of the indigenous subsistence economy for centuries, essentially paving the way for a takeover by a handful of families (Skidmore and Smith, 2001). In a short period of time the Salvadoran state took a complex system of communal land ownership that had been evolving over four centuries and turned it on its head, dictating that all land ownership and use would henceforth be based on individual property rights. This concept was completely foreign to the indigenous population and its effects are still being felt today (Browning, 1998).

¹⁴ Ruiz was talking about Colombia in particular, but this can easily be generalized to encompass most, if not all of Latin America.

¹⁵ Here I am speaking in general terms. There is no doubt that many people are concerned about the plight of the rural poor. But action to do something about this, especially by governments, has not particularly forthcoming.

Henrik Ronsbo (1997) argues that one of the most significant aspects of this new state policy was to divide Salvadoran society into dual camps. One was a small group of large landholders who would partake in the country's development and have their interests protected, and the other would be excluded and perceived as a delinquent and deviant body that ought to be policed. The tremendous wealth amassed by a handful of families from coffee propelled them into the international elite, and simultaneously drove the overwhelming majority of Salvadorans into abject poverty. In order to prevent the development of social aspirations among the rural poor, the Salvadoran state even denied them a formal education (Munro 1918). A form of economic Darwinism evolved around the coffee industry and those that already had access to capital were at a strong advantage. "Given a situation where the scarcest factors of production were capital, entrepreneurial talent, and land," writes historian Hector Lindo-Fuentes (1990) "every aspect of the coffee economy contributed to increase inequality" (p.121).

This approach to dealing with rural communities has continued and has been particularly prevalent with respect to deficient water and sanitation services in rural communities, despite the fact that roughly half of all Salvadoran's live in rural areas (RAS-ES, 2001). This is an interesting paradox, since so much of the urban population's water comes from rivers and lakes in rural areas. The natural availability of fresh water in rural areas, relative to population density, could easily mislead one into believing that potable water is readily available to rural people. However, as already noted, the sparse populations of these areas make it costly to finance rural water and sanitation projects. According to Larios (interview, 20 January, 2006), for a water system to be profitable in El Salvador, it has to have at least 2,000 connections. This is virtually impossible in many rural areas, meaning that a system, if it exists at all, essentially has to operate at a

loss. Thus, while urban services are often far from ideal, they are typically far worse in rural areas. El Salvador serves as a case in point.

The large aquifers under the volcanic mountains surrounding San Salvador have been overexploited for decades by the city's swelling urban population, as well as its industry. According to UNES (2005), nearly 90 per cent of all of the water now consumed by Salvadoran's comes from underground sources. This is because growing demand, pollution, poor soil use, and poor source management have left the country's superficial sources exhausted and unsuitable for human consumption (p.29). Ironically, the Pan-American Health Organization (PAHO) and the World Health Organization (WHO) (2003) call the lack of investment in rural infrastructure, particularly water and sanitation services, one of the biggest incentives for urbanization.

Ultimately however, as the city's ability to access potable water becomes strained, new sources are sought out, inevitably leading to the countryside. This has been witnessed in El Salvador, where the rural areas are being forced to subsidize the water poverty of the cities—particularly San Salvador—but the cities are under no obligation to reciprocate by subsidizing the infrastructural poverty of the rural areas, which would ultimately help to improve their water and sanitation services. Larios (interview, 20 January, 2006) argues that since rural areas are subsidizing the water needs of urban areas, urban areas should pay more. This would help to pay for the services of poor rural families, and also help conserve the source, which all Salvadorans need.

However, the reality is quite the opposite. The President of the Asociación Nacional para la Defensa, Desarrollo y Distribución de Agua a Nivel Rural (ANDAR—National Association for the Defense, Development and Distribution of Water at the Rural Level), Julio Menjivar (interview, 29 March 2006), observes that “the urban areas

don't contribute anything to the rural areas except for garbage. Rural areas send clean water to the cities, and the cities send it back to them polluted. And they [urban areas] are subsidized to do it too".

In rural areas, water and sanitation systems are usually controlled locally, often through groups such as ADESCO. In such a case, the community is the owner of the system and has to take on the management of the system, which means they also need to establish the norms and regulations required to provide services to the community. This can be a positive experience, whereby the community learns to organize itself effectively. However, often water needs exceed the community's capacity to deliver and outside help is needed. UNES (2005) argues that in such cases, state institutions like ANDA or the Fondo de Inversión Social para el Desarrollo Local (FIS-DL) should step in to provide support. However, they are often of little help, particularly in ANDA's case.

VII Rural Water Networks

To address this shortage of service in rural areas, the Plan de Saneamiento Básico Rural (PLANSABAR—Rural Sanitation Plan) was created by the Ministry of Health in 1962. During its lifetime (1962-95), some 315 systems were created under the aegis of PLANSABAR throughout the country (UNDP/PNUD, 2001b), and financed through the Inter-American Development Bank (IDB) as part of a greater water and sanitation program (PAHO/WHO, 2003). Historically, PLANSABAR offered water and sanitation services at a fixed rate that never exceeded US \$1.14 per month (UNDP/PNUD, 2001b).

In 1995, PLANSABAR came to an end and its 315 rural systems were transferred to the control of ANDA, which in turn created the Rural Management System (Cuellar

and Larios, 2001). Much of the blame for the elimination of PLANSABAR centers on financial constraints, but Julio Menjivar of ANDAR suggests another, pernicious, cause, as well. He suggests the ARENA government suppressed PLANSABAR because it was the project of another party from a previous government; ARENA had no vision about continuing to offer water services in rural areas; and ARENA didn't want to continue employing public employees hired by another party (Menjivar interview, 29 March 2006).

The directives formulated under the aegis of PLANSABAR still govern many of these systems (UNDP/PNUD, 2001b), but according to PAHO and the WHO (2003):

Since the disappearance of PLANSABAR... many of the institutional strengths that existed before were not able to adjust adequately to a new reality... those communities where systems still remain, find themselves without technical support, with diminishing electrical subsidies, and worse still, with enormous debts to the electrical companies... In the case of the existing rural systems in El Salvador, the most serious vulnerability that exists is the lack of institutionalization and the lack of an adequate legal system (p.14).

Much of the debt that has been accumulated can be traced back to the privatization of electricity services in 1997, which resulted in a 900 percent increase in the cost of electricity within just one year. This made many of the water and sanitation systems impossible to maintain financially (ANDAR, 2005: 2). Furthermore, technically speaking, these systems have come to the end of their useful lives, with maintenance now added to the already heavy financial burden. (Cuellar and Larios, 2001 and UNDP/PNUD, 2001b).

During the 1980s, NGOs began to appear to help to implement and administer water and sanitation systems in the country. According to PAHO and the WHO (2003), today there are some forty governmental and non-governmental organizations that are

working in the area of water and sanitation in El Salvador (p.13-4). ANDAR, which emerged at the end of the 1990s to help coordinate this monumental challenge, is one such organization. ANDAR's objective is to work with rural communities to promote and strengthen popular participation in order to defend their "right" to water, with a sustainable development vision. Various other institutions, such as CARE, Creative Associates International (CREA), and Project Concern International (PCI), also emphasize the role of participation in the construction and management of self-sustaining community water and sanitation systems (Cuellar and Larios, 2001).

Despite the fact that there are several Salvadoran departments and agencies that are "technically" involved in providing water services to rural people, ANDAR (2005) charges that since 1995 when PLAN SABAR came to an end, "the central government has left the responsibility of building new systems to international organizations, evading its constitutional responsibility to provide for the health and well being of the country's inhabitants" (p.11). Today many rural areas depend on external funding or on FIS-DL, which financed approximately four hundred water and sanitation projects in rural areas throughout the 1990's (Cuellar y Larios, 2001).

However, even with the help of international development groups there has been no noticeable improvement in rural water and sanitation services in El Salvador. The Canadian International Development Agency's (CIDA) Salvadoran water engineer, Nelson Estrada (interview, 4 April 2006) highlights the fact that international development agencies have only helped to increase service coverage by about three to four per cent in recent years, a figure roughly on par with population increases. Ultimately, this means that there has been a net increase in coverage of zero. Moreover, interviewees consistently complained that international donors are scaling back their

activities in El Salvador, leaving a vacuum in the provision of much needed social services, and leaving the poor with fewer options for developing communities.

VIII Deficient Services

An indication of the disproportionate bias towards the urban centers is the fact that some 71 percent of rural households do not have a direct water connection and more than a third of households rely on gathering their water directly from local rivers or wells as their primary source of water. In the northeastern department of Morazán, fully 85 percent of the population is lacking an adequate water supply and 91 percent lacks adequate drainage. In neighboring La Unión, those figures are 86 and 91 percent, respectively (Cuellar and Larios, 2001: 3-4). UNES (2005) charges that this tremendous disparity between the major centers and the countryside, “indicate the notorious abandonment of rural areas”, discussed above (p.31).

Furthermore, in a separate study carried out by MARN (1998) which included 18 rural municipalities in three separate departments, it was discovered that only 29 per cent of households had access to safe drinking water (p.15). The definition of “safe drinking water” used is that established by United States Agency for International Development (USAID): there has to be a tap inside or close to the home, or some other source of water close to the home and the water from these sources must be treated with chlorine (see *Ibid.*). This is a broad definition with very vague guidelines for quality. This has prompted Quezada (interview, 6 March 2006) to suggest that the quality of water is not guaranteed, usually failing to meet international standards. “So you can’t be sure that this

water is actually potable”. Furthermore, it should not go unnoticed that there is no mention as to how often the water must be available.

For this reason, Gloria de Avila of RA-SES (interview, 5 April 2006), is highly critical of “official” statistics on water supply. She notes that many people throughout the country have a tap right inside their homes, but only have water service a couple of times a week, and only for a couple of hours each time. In severe cases, a tap can go months at a time without a single drop of water falling from its spout. “But these people are still counted in the official statistics as people with access to water”. Out of the families studied by FUSADES (2001), only 87 per cent of those with access to piped water—or 35 per cent of the total—have access on a daily basis, and this is only for 13 hours per day (p.6).¹⁶ Furthermore, this says nothing of those who have to rely on wells, rivers, and water trucks.

The same rural water study determined that fecal matter was detected in 61 per cent of tests and E-coli in 52 per cent (p.14). Furthermore, MARN (1998) showed that 90 per cent of water consumed by people in rural areas that it surveyed, was consumed without any type of treatment whatsoever — many people had stopped chlorinating or boiling their water because of a perceived unpleasant taste (p.40). Like so many other studies, FUSADES (2001) concludes that sanitation services in El Salvador are even worse than potable water services. Only seven per cent of surveyed households had a private toilet, while some 82 per cent had to rely on a public toilet of some sort (p.7).

Estrada (interview, 4 April 2006) points to an IDB study that concluded that in order to meet El Salvador’s Millennium Development Goal (MGD) for water, there

¹⁶ One further point to note is that FUSADES does not specify what hours of the day that water is available. For example, it does not specify if the water is available for 13 hours beginning at 6am, noon, 6pm, or midnight, etc. Most likely, it is different for different areas, and probably not consistent.

would have to be an investment of about US \$40M in the next ten years. But there is no type of investment of this nature. According to ANDA's own figures, between 1994 and 2001, the Salvadoran state invested on average US\$5.58 per person/year for water and sanitation in urban areas, in contrast to rural areas where the investment was on average only US\$1.07 per person/year (see PAHO/WHO, 2003: 3).

This lack of investment in water and sanitation has inevitably translated into the breakdown of the current system, and an inability to expand services to other rural areas where they have never had the infrastructure to provide running water in the first place. Although there are many consequences to the lack of access to clean drinking water, the real tragedy ultimately plays itself out in terms of the human cost. El Salvador's under-5 mortality rate is 28 per 1,000 live births, and twelve percent of these deaths are caused by diarrhoeal diseases, which are closely linked to poor quality water and sanitation (WHO, 2006). According to the Ministerio de Salud Publica y Asistencia Social (MSPAS—Ministry of Public Health and Social Assistance), every year some 12,000 children below the age of five die from water-borne illnesses — 75 per cent of these deaths, or 9,500, are children living in rural areas (see ANDAR, 2005: 4).

Intensified workloads associated with the absence of water services have also added to this cost. As women and children are responsible for the domestic work, the burden of providing water for the household lay squarely on their shoulders. In many cases gathering water can consume as many as four hours of work daily (Cuellar and Larios, 2001), and households living in extreme poverty are forced to spend as much as 14 percent of their time gathering water (FUSADES, 2004: 9). This is work for which there is typically no economic remuneration whatsoever, and so it only results in the

further marginalization of women and reinforces their subordinate position in Salvadoran society (Cuellar and Larios, 2001: 10-1).

IX Growing Disparities

With 41 percent of all citizens now lacking a domestic water connection (CESTA, 2004: 10), disparities in water consumption in El Salvador are tremendous and growing. PRISMA estimates that while the bottom 20 percent of Salvadoran households with a domestic water connection consume 81 liters of water per person/day, or 7 percent of the total, the top 21 percent of the population consumes 531 liters per person/day, or 49 percent of the total. Compare this to wealthy European countries like Belgium and Germany which consume as little as 120 liters per person/day (Cuellar and Larios, 2001: 6).

Sewage services, just as at the international level, are in an even worse state of affairs than water services in El Salvador. At the end of the 1990s, only 2,009,930 people—or roughly 1 out of every 3—Salvadorans had sewage services. Again however, these services were overwhelmingly offered to urban residents. 63.5 per cent of those with sewage lived in the capital of San Salvador, and 10.8 per cent in the city of La Libertad. The remaining services were spread throughout the rest of the country. (UNDP, 2001b).

The UNDP (2006b) points out that although El Salvador has one of the lowest tariff systems for water consumption in Latin America, it is also among those that offer the worst coverage. Agua Inicial 2015 (2006) and the UNDP (2006b) point out that one of the most troubling aspects of El Salvador's water crisis is that the poorest people

with the worst potable water services, are actually paying much more than those who can afford to pay substantially more and have much better service. Furthermore, those with much better service end up wasting a tremendous amount of water because there is little incentive to do otherwise. The reason for this is that buying water from private vendors costs as much as 100 times what it costs for those with a private domestic connection (IA 2015, 2006: 18). Ultimately, this reversal in logic—whereby those best suited to pay actually pay the least—results in the country being unable to make the investment necessary to expand and improve water coverage throughout the country (UNDP/PNUD, 2006b).

X Delicias

The community of Delicias existed for some two hundred years before finally gaining access to potable water, and before that it was just like hundreds of other communities throughout the country that still lack access to potable water (Claros interview, 4 April 2006). Prior to having their own water delivery system, community members had different sources for water, but none were particularly easy to access. Some members would go to a nearby village where ANDA supplied water to a public tap. The tap provided good quality water but it was not reliable and frequent water cut-offs resulted in people having to buy poor quality, highly priced water (US \$0.80-1.0/barrell) from water trucks (FG 3, 9 February 2006). However, it was not uncommon that more than a week would pass without a truck visiting the community. This meant that community members would be forced to go to the river to access water, which was not a very appealing option for many reasons.

Firstly, the river was polluted, and would often make people sick if it was consumed, or would result in skin problems if they bathed in it. People would have to go to the river twice a day; once in the morning and once in the afternoon. Travel conditions to the river were very poor and community members had to walk several kilometers up and down a rough, rocky hill carrying water and clothes. It was not uncommon for people to fall and spill their water on the way back up the hill and have to return to the river again. Just obtaining water for drinking could consume as much as two and half hours a day. Many women would have to bring their young children to the river with them, while others would have to leave their children at home alone. In addition, women would have to spend as much as half a day, once or twice a week washing clothes at the river (FG 9, 31 March 2006).

Delinquency created another obstacle. Men from other villages would sometimes wait along certain paths to rob people traveling to the river. Sexual assaults on local women traveling to the river were also reported on occasion, and this made many people—particularly women—very nervous about taking the long trip to the river (FG 9, 31 March 2006).

The idea for a water project in Delicias originated in the 1980s; however, the mayor at the time would not support the project. For decades political candidates had been promising potable water to residents of Santa Cruz Michapa in order to obtain votes, but once the election was over, incumbents would renege on their promise. So in 2000, when the ADESCO in Delicias began holding meetings to discuss a potable water project, previous disappointments in getting a water project off the ground created serious doubts and reservations among many community members, despite the fact that other community

projects had recently been implemented successfully (FG 3, participant 8(M) 9 February 2006).

However, the 2001 earthquakes served as a catalyst for change in Delicias. The earthquakes helped community members realize just how dependent they were upon each other for gaining access to supplies, but also to rebuild their community. Community members suddenly became more interested in seeing the community united because of the benefits cooperation could bring. “We wanted to unite ourselves in hopes of having something better” a community member recounted (FG 5, participant 14(M) 25 February 2006). Attitudes in Delicias began to change and people began to be more concerned about the welfare of their neighbors. “We’ve had a change of conscience” claimed another community member “and now we are more concerned about other people” (FG 5, participant 10(M) 25 February 2006).

A community leader from the ADESCO in Delicias had heard that CARE developed and implemented community water systems throughout the country, so she approached a water specialist from the organization to request CARE’s assistance and CARE agreed to begin holding meetings with the community to develop a plan. It was discovered in the process that the central community (El Centro) in Santa Cruz Michapa, was also attempting to implement a water system and had already purchased land with an aquifer to supply its drinking water. Community leaders from Delicias and CARE approached El Centro to discuss the option of working together on the project (Umaña interview, 4 April 2006).

El Centro had been in a process of dialogue about developing a water system with the municipal government for years, and in the beginning was not in favor of sharing their water supply with other communities because they did not want them free-riding on their

investment. However, a study was conducted that revealed that there was sufficient water to supply the other communities as well, and after more than three months of negotiations, CARE managed to convince El Centro that a system designed to supply water to a wider community would be more economical than a smaller system. Whereas a smaller system, providing water twenty-four hours a day would require a quota of US \$12/month/household to be sustainable, a broader network would only require a quota of about half this amount.

Despite the fact that the total per capita cost to implement the project, and the monthly quota for water service would be nearly halved by incorporating other communities, the project would still be very expensive to implement. So a compromise had to be reached. The municipality agreed to allow the other communities to use its aquifer, to pay for the water tank and electrical system and some other materials, which cost US \$256,868.40. CARE committed to provide technical assistance for the project, serve as the implementing agency and to match dollar for dollar, whatever the communities and municipal government contributed.¹⁷ This resulted in them paying for construction materials and the water pump for the system. CARE calculated its financial contribution at US \$538,430.80. The community contributed manual labor which was estimated to cost US \$89,896.81, and constructions materials which cost US \$16,500. They also had to find a way to purchase 27km of piping for the project (CARE, 2005 and Claros interview, 4 April 2006).

A bank loan was also obtained to help finance the project and a local Jesuit group agreed to contribute funds as well. A commission of leaders was formed to “knock on

¹⁷ CARE El Salvador commonly undertakes projects by matching dollar for dollar what the recipient generates.

doors” in order to secure the funds required for the piping. Amanco, a Salvadoran construction company specializing in just the kind of piping needed offered to provide a US \$97,000 credit for the system. The benefit of dealing with Amanco was that they treated the community like a big company, giving them a price sixty percent below the commercial rate, with no interest for a year (Rivas interview, 6 February 2006 and Claros interview, 4 April 2006). An agreement was then reached whereby each household would contribute US \$140 toward the credit owed to Amanco. As this was a significant amount of money for poor Salvadoran’s to invest, it was determined that each household would pay \$12.50/month until their debt was paid off (FG 8, 10 March 2006 and FG 9, 31 March 2006).

In order to help implement the project, three committees were formed: 1) an environment committee; 2) a health committee and; 3) a coordinating committee. In order to ensure the well would not become exhausted, the environment committee arranged to have some 6,500 trees planted covering an area of 1.5 km between Delicias and the Central community. There were also cleaning campaigns organized by the health committee in order to improve health in the community more generally (FG 3, participant 3(M) 9 February 2006). For its part, the coordinating committee organized excavation groups and divided them by household. Each group would spend one day per week excavating, and if a household did not show up on its specified day of work, they would have to pay a \$5 fine (FG 9, participant 6(F) 31 March 2006).

In addition to this, CARE had four technicians working with the communities full-time to help them design and implement a water delivery system that would bring potable water into every home, put latrines in homes where there was none, and implement a system to recycle grey water and safely dispose of black water. The whole process took

two years to complete; one year of dialogue, and one year to execute (Claros interview, 4 April 2006).

The project was designed by CARE to do more than solve the immediate problem of bringing potable water to the communities. It was an effort to create a mechanism for more solid organization with the goal of ensuring that the community had the capacity to manage the project themselves by creating a permanent dialogue on how water impacts health. CARE refers to this process as “shared responsibility”. “We are trying to resolve the causes of poverty, not the effects” CARE’s Jonathan Claros (interview, 4 April 2006) reasons. “I can’t bring teachers to them, but I can teach them to knock on the right doors to get the teachers they need... So what you refer to as mutual aid is what we would call shared responsibility. What you are talking about academically, we are trying to put into practice”.

The group that benefits most from this type of project are children under the age of five. Lack of clean water, and proper sanitation result in multiple cases of diarrhea, and when they hit children under the age of five, it has a tremendous impact on their physical and mental development. “Children with water in their homes” Claros maintains “are bigger and stronger than children without it, because they have better health. So when you put a teacher in front of a healthy child, they are much more likely to be able to absorb the information they are being taught”.

The water system began to function in September 2005 and Manantiales de Cuscatlán (Cuscatlán Springs) was the organization created to operate it. The organization became responsible for all aspects of the project, including water purification and cleaning the tank. It consists of two representatives of the municipal government, and two elected members from each community. Members are elected on a

rotation whereby every three years, half of them are replaced and half stay to train the new members (Rivas interview, 6 February 2006).

The water system has brought about significant economic, health and social changes in Delicias and the other communities. Before the project was completed, each household required approximately two barrels of water/day, costing upwards of \$1/barrel (0.2m³ or 200 liters) from the water trucks. Beneficiaries of the project now pay only \$6/month for 16m³ of water (Claros interview, 4 April 2006). This represents an increase of up to a third and at just a tenth of what it used to cost from water trucks. A metered system is used to calculate the monthly quota for each household. Each household is allowed a minimum amount (16m³) for \$6/month, and the quota increases progressively. Those families that consume more water have to pay more for the service (Umaña, 4 April 2006).

Community members reported a noticeable improvement in their health and their children's health, with far fewer cases of diarrhea and rotavirus.¹⁸ Community members are happy that they can now wash their hands after using the bathroom, and that they have the opportunity to form the habit in their children at an early age and are able to observe the improvement in their children's health, meaning they can remain more focused on their education. There has been considerable transformation for the elderly as well. One elderly man recounted that he used to have to go more than a week without bathing, but that now the elderly can bathe right in their homes (FG 5, 25 February 2006).

From a social perspective, the change has been significant as well. People feel safer now that they no longer have to travel to the river, and they also have more time to

¹⁸ Rotavirus is a virus transmitted by the fecal-oral route and causing severe diarrhea, particularly in small children. In developing countries, rotavirus often causes death in infants due to severe dehydration.

dedicate to other issues and activities. Many women are now able to dedicate more time to their children, and they also have more time to regularly take part in meetings and influence community decisions (FG 8, participant 8(F) 10 March 2006). Community members feel there has been an overall improvement in their quality of life. One elderly man who lived his whole life in Delicias claimed that he felt that the community is much more civilized now. "Now we have lights, telephone, mail service and water" he proudly reminded his younger neighbors (FG 5, 25 February 2006).

A great deal has been learned by those that participated in implementing the project. Conservation is one notable area where community members have become more knowledgeable and conscientious. They've learned not to waste water and to recycle grey water to use for growing plants and vegetables (FG 3, 9 February 2006). They've also learned how to work together to achieve common goals. "The project has united us, instead of dividing us" claimed one community member. "We've learned how to approach an institution, we've learned how to approach the municipal government and we've learned how to organize" (FG 8, participant 5(M) 10 March 2006). "Now we have experience too" claimed one woman. "We know how to work together and we're prepared for new challenges (FG 9, participant 8(F) 31 March 2006).

Whereas Delicias and the other communities used to be among the poorest in Cuscatlán, CARE technicians that worked in the area during the two-years it took to implement the project now see a community that has been empowered. Not long after the project was completed, ANDA came to the municipality because it wanted to drill another well close to the one used for this project. But the communities resisted the plan and held a meeting with the mayor and ANDA to let them know that they would not allow their water supply and their hard work to be put in jeopardy by drilling another well so close to

theirs. "What this shows" Claros (interview, 4 April, 2006) argues "is that they've become empowered, even though ANDA tried to come in and ignore them... The other community that wanted the well wasn't the problem, but they needed to drill the well somewhere else that wouldn't put this community's water at risk".

Divisions between communities and community members used to be deep, but the water project provided an opportunity to resolve these divisions with a view for the long-term. Community members are not only trying to find new ways to ensure the future of their water supply and system, but are also thinking about new projects to improve their quality of life, including building a park, a public pool or a school (Ibid.).

Chapter 4—Analysis

I Introduction

It is evident from the empirical data on poverty levels, lack of social services and the extent of environmental degradation that the Salvadoran development model has not been successful. The historical trends outlined in the last Chapter resulted in the vast majority of the country's wealth and land being concentrated in the hands of a small number of people who own the country's industry and occupy the highest paying jobs. They also represent the country's political elite who also serve as the government's Ministers and ambassadors. They send their children to be educated at the top universities in the United States and Europe and live in homes most of us only see on television. At the opposite end of the social ladder, the vast majority of people eek out a living in low-paying sectors such as subsistence agriculture, maquiladoras, or selling pirated DVDs on street corners. They survive on only a few dollars a day, live in shantytowns and adobe huts and often have to withdraw their children from school after only a few years because they either can not afford to pay the fees or because the child is needed to work to help support the family. Their only interaction with the country's elite is to serve as their maids and security guards or when political candidates come into their community in search of votes. Those who manage to keep their heads above the poverty line often only do so because they receive remittances from a relative employed in the abroad.

Like the country's land and wealth, services are also reserved for the elite, who do not go wanting for education, health, or any other social service because they can afford to purchase it. They have subsidized water piped into their homes for general use and bottled water delivered to their doorstep for drinking. The roads they use are paved and their communities are like fortresses surrounded by walls and guarded by armed men. On the other hand, the poor send their children to be educated at schools that lack basic supplies and are staffed by teachers who are barely paid a living wage. Their water is supplied by trucks, their roads are full of potholes and armed gangs roam their neighbourhoods operating petty crime rings recruiting local children into their ranks.

The degree of environmental degradation often associated with high-levels of poverty is another symptom of the Salvadoran development model. Although coffee no longer plays the role in the national economy that it used to, we can trace current levels of deforestation, soil erosion and pollution to the boom years that began in the mid-19th century. Furthermore, we encounter no data in El Salvador to contradict Blaikie's (1985) argument that the poorest suffer most from environmental degradation (see Chapter 2). Poor soil quality results in low crop yields which in conjunction with deforestation alter the water cycle making the river flows needed for irrigation unpredictable. Furthermore, what water can be accessed is dangerous for human consumption, which explains in part the high number of child deaths associated with contaminated water. The level of pollution in the country's rivers is well known among the population. Once on a trip to visit a museum in Morazán, my group's driver felt an obligation to stop along the way to let us cool off in the Sapo River. He explained that the obligation he felt was not due so much to the sweltering heat but to the fact that this was the only safe river for swimming in the entire country. Although he was exaggerating slightly, it was not by much.

Practically every river in the country is indeed far too polluted to swim in, let alone to drink from, because regulations do not restrict companies from flushing their chemical waste into the river nor does it force ANDA to treat its sewage before doing the same.

It is also evident that rural areas have borne the brunt of this ill-conceived development model. Since collective property rights were repealed in the mid-19th century for the individual property rights more conducive to amassing huge personal fortunes than developing the country, the Salvadoran state and the elite have neglected the basic needs of the rural poor, when they do not actively oppose them. It is painfully obvious that the tragedy of the Salvadoran commons has not been due to the fact that it has been unmanaged, but that the history of resource management in the country has seen a shift toward individual property rights.

Although exogenous factors have surely played a role in the current reality, El Salvador cannot claim that its problems are solely due to the fact that it has only recently been able to escape colonial rule, as Africa can reasonably claim. It cannot, like Haiti, Cuba and Nicaragua, claim to be the victim of repeated American military interventions that have prevented it from realizing its full potential. Nor can it claim to be the victim of neoliberal policies, forced upon it following the collapse of the Soviet Union. Since 1989, the ARENA government has wilfully and enthusiastically implemented Chilean-style economic reforms. Unfortunately, the country has not experienced Chilean-style growth.

Furthermore, there is no indication that there will be any shift toward another development model any time in the foreseeable future. The Salvadoran state has given its population no hope that it has any vision for resolving its water predicament, nor that it has any vision that will lift the country out of poverty. More disconcerting still is the fact

that international donors, the only group that has shown any concern for providing social services in rural areas, are now shifting their efforts and their limited resources to other parts of the world.

So what is the solution to this deepening water crisis, and what path can rural Salvadoran communities follow to bring potable water into their communities and into their homes? The answer is provided by mutual aid—as both an *operational* and an analytical concept--and Delicias is an indication of its success. Delicias used to be as impoverished as hundreds of other rural communities in El Salvador. However, once they were able to harness sociability and reciprocity in their social activities, they were able to embark on a path to community development that has given them one of the most vital elements for creating development: potable water.

Facilitating sociability requires constant interaction between community members in order to break down the barriers preventing the emergence of cooperation. Involving the ADESCO in the process was an essential step for speeding up this process because community members had a positive perception of the group and were able to invest their confidence in it because they knew it had successfully undertaken other community projects in the recent past. It was also essential because it had a proven track record of organizing people around a common objective. If an organization like the ADESCO had not been present it would have taken a considerably longer time to put a water project in motion because sociability is not imposed, it evolves, and evolution can be a slow process.

The second step that was required to allow sociability to take hold in Delicias was to tear down divisive barriers. Like other communities throughout the country, divisions in Delicias were along party lines. Community members therefore had to find a way to

eliminate partisan politics from their project, or at least agree to disagree on political matters. Through discussions during community meetings they came to the realization that *no party* had provided them with potable water and that their common goal of implementing a water project in their community would never be realized by appealing to one party over another, it would only come about by eliminating any reference to divisive party platforms. It was therefore decided that political parties were not to be discussed during water project meetings and that all party posters and flags were to be taken off the walls of the ADESCO community center.

Facilitating reciprocity required that each community member intending to gain from the project be involved in the process. Furthermore, it required a relatively equal sharing of the burden by each household in order to ensure nobody could free-ride on the work of others. Free-riding would inevitably result in feelings of resentment and lead to divisions within the group. The first condition necessary for reciprocity to evolve is that community members must be confident they will not be cheated out of their contribution, either in terms of money, labour or planning. Small communities are conducive to the development of this condition because they know their neighbour is not going to suddenly flee the community in order to avoid obligations of reciprocity.

Keeping the monetary contribution equal was relatively easy. Each family had to contribute US \$12.50/month for a year to help pay for the implementation of the project. This was somewhat harder for some families than others, depending on level of income¹⁹, but after much negotiation it was agreed that this was a fair distribution of the economic burden. It was also relatively easy to determine how to distribute the physical burden of

¹⁹ According to CARE (2003) El Salvador, monthly household income in Delicias ranged between US \$20 and \$300 (p.8).

manual labour. Each family would dedicate one full day per week to excavating the area where piping would be laid. This was hard work, but knowing everybody had to bear the same burden and that you were not being exploited made it bearable. Finally, the distribution of the burden for planning was kept equal by having each person join one of the three committees—environment, health or coordination. Committee members were responsible for attending the meeting of their respective committee, and members were keenly aware of who was and was not doing their part and relied on social pressure to ensure each member did their fair share. This also had the effect of deepening the democratic process and creating a sense of ownership over the project.

In attempting to understand the empirical data from Delicias, and moving to a more general set of observations, we can say that in the natural and the social sciences there has been a disproportionate amount of attention paid to competition and egoism, and far too little to cooperation and sociability. Too many biologists are preoccupied with selfish genes, rather than cooperative groups; political scientists are more interested in how statesmen wage wars than how everyday people keep the peace; and economists are more concerned with how we compete with each other for our wants rather than how we cooperate with each other for our needs.

In addition to reflecting on the empirical data used to understand the success experienced by Delicias, we will also have to engage in a deeper analysis of how cooperation—especially as this is captured by the concept of mutual aid--actually evolves in human beings. This will require a re-assessment of the literature of Chapter 2, now illuminated by the light of our case study. Such an analysis has been left wanting for a very long time in the field of international development, and it is hoped that by providing it in the following pages, we will encounter a better analytical concept for discussing

community development and the management of the commons than what we have had at our disposal up to now.

II Competition and the English Doctrine

In trumpeting a one sided view of evolution, few of its proponents acknowledge it as a strain of thought originating in the British “preoccupation with practicality and competition” which Daniel P. Todes (1987) describes as “a purely English doctrine”²⁰ (p. 541). The notion that progress was dependent on competition is rooted in a long British tradition extending long before Darwin and fitting of the “spirit of the age”. Adam Smith posited that individual competition was necessary for economic progress; he was followed by Thomas Malthus, who concluded that in a world of limited resources the “struggle for existence” was an inevitability; and in keeping with the mindset of his fellow countrymen, Herbert Spencer theorized that the “survival of the fittest” would generate human progress over time (Larson, 2006). “Thomas Hobbes was Charles Darwin’s direct intellectual ancestor”, writes Matt Ridley (1998). He continues, “Hobbes (1651) begat David Hume (1739), who begat Adam Smith (1776), who begat Thomas Robert Malthus (1798), who begat Charles Darwin (1859)”. John Maynard Keynes has describe the Origin of Species as “simply Ricardian economics couched in scientific language” and Stephen Jay Gould would later write that natural selection “was essentially Adam Smith’s economics read into nature” (p.252). This “English doctrine” goes at least as far back as the 17th century writings of Thomas Hobbes and John Locke to the popular

²⁰ It might be more accurate to call this a British doctrine since many of the thinkers associated with it were actually Scottish in origin. However, in the literature relevant to our thesis it is commonly known as the English Doctrine. It is also worth noting that in political science and classical economics it is known as Liberalism.

modern day concepts of “selfish genes” (Dawkins, 1989), the “clash of civilizations” (Huntington, 1993) and the “coming anarchy” (Kaplan, 1994).

Over the years, Darwin’s theory has been consistently drawn upon to legitimize competition and domination of one group over another. Social Darwinism is one such example, whereby Darwin’s theory is used to lend scientific credence to the view that society amounts to a competition between individuals and, ultimately, between their social groups. This view is particularly prominent in economics. “Meshing nicely with the philosophy of free market capitalism,” writes Christopher Merrett “Social Darwinism implied that in society, as in any competition, there were going to be winners and losers”. Therefore, it is only natural for there to be rich and poor in society, and policies designed to help the poor only serve to upset the balance of human nature (Merrett, 2000: 208-9). David Livingstone (1992) has argued forcefully that such Darwinian extrapolations have been used to justify miserly welfare policies, racial segregation, colonialism, imperialism, and the exploitation of impoverished countries by rich, industrialized countries (p.186). To this list we might add the management of the commons.

Neoliberalism provides an indisputable example of the English doctrine in the field of development, whereby policy prescriptions in the marketplace encourage constant competition between people, creating barriers to any sort of meaningful form of cooperation that might produce common benefits like a properly functioning community school, health clinic or water system. In many instances the state will step in, but usually to little avail. This has been the outcome of neoliberal policies adopted in El Salvador and PLANSABAR serves as a shining example. Once the international community withdrew, the state handed the responsibility over to its ineffective national water agency, leaving the existing rural water infrastructure to fall into disrepair. In theory, the state

took over the role of providing potable water to rural people, but in reality there has been practically no service and people have been forced to revert to market mechanisms of demand and supply. Of course, the market is not designed for the poor who find themselves unable to survive in any dignified manner. The effects of these policies are evident in every community in Santa Cruz Michapa, except for Delicias. In the other communities, people are still forced to go to the local river or to continue buying poor quality water from trucks. In a handful of homes throughout the rest of the municipality ANDA and the municipality have been able to provide people with running water in their homes at different points in time, but this is rarely for more than a few hours per week.

The overall picture of this ill-functioning system of potable water provision is not best summed up by the statistics provided in the last Chapter, nor by the accounts of community members during interviews and focus groups. The reality is evidenced by walking into the community health clinic in Santa Cruz Michapa and encountering long line-ups of mothers cradling babies that have become sick from water borne illnesses.

Basing free-market policies on scientific grounds—using Darwin as a basis—serves to give them a value-free aura. This is clearly present in the development theories of Rostow and Fukuyama, who assert that by following in the natural evolutionary path created by rich nations, their poorer counterparts can also become prosperous (Merrett, 2000). According to current neoliberal thinking, the world market is like a natural environment where everyone has to adapt in order to survive. Oswaldo de Rivero (2001) writes:

Those persons, companies or national economies that fail to adapt are punished and pushed onto the sidelines as economically non-viable species. It follows that the market is not a human

creation, but rather a natural environment, beyond our will... All problems will be solved by the natural market forces. They will select the persons, companies or national economies that are efficient, exactly as nature selects the most fit among the species, discarding the unfit (p.78).

Cambridge University professor Gerry Kearns (2004), posits that “arguments about the natural basis of social arrangements are usually forms of special pleading used to demonize alternative, supposedly unnatural, configurations” (p.342). Rather than acknowledging and building upon both the competitive *and* cooperative elements of human nature, many economic theories of development have isolated, elaborated, and trumpeted the competitive, while at the same time ignoring and even denying the cooperative. Kearns concludes:

Demonstrating the reality of mutual aid among animals undermined the naturalistic arguments for capitalism, war and imperialism. If nature contained both co-operation and competition, the one could not be asserted over the other simply on grounds of natural imprimatur. Further, if co-operation not only served an evolutionary purpose in the development of higher, social animals, but had also flourished as the basis of human societies at periods of greatest individual freedom, then any civilized society might find it a virtue and practice worth cultivating (p.342).

Although community interaction in Delicias bordered on being anti-social for many years, as Kearns theorizes, people came to see the virtue of cooperation and felt it was indeed a practice worth cultivating. The result has not simply been access to potable water. The newly discovered virtue of community cooperation has been an empowering experience that has provided them with a sense of civility, as the old man from the last Chapter recounted, and a new framework for social action that will allow them to achieve things that other communities only talk about.

III Mutual Aid

Kropotkin (1989) saw social communities among human beings as the result of sociability which was “as much a law of nature as mutual struggle” (p.5). Sociability resulted in compassion towards others, which he hypothesized was “a necessary outcome of social life” and a “considerable advance in general intelligence and sensibility” as well as “a powerful factor of further evolution” (p.60). He did not see mutual aid as love, or even sympathy, but rather a repertoire of behaviours developed as a result of evolution (Shone, 2000); that is, its basis was scientific rather than religious.

Because of sociability, he saw in individuals—both human and animal—the willingness to endure a great deal of suffering and self-sacrifice in order to preserve the interests of the greater group. Like Darwin (2007) in his later work on human beings, Kropotkin believed that sociability likely resulted out of necessity but over time became woven into the fabric of society (Glassman, 2000). The strongest in nature were not those who were constantly at war with each other, but those who had learned how to cooperate. Those that practiced mutual aid exhibited the highest level of intelligence and strength and had the greatest chances for survival (Kropotkin, 1989). Therefore, humans should be encouraged to bring about “common ends” through “common effort” (Kropotkin, 1992: 22). “That is the surest means for giving to each and to all the greatest safety, the best guarantee of existence and progress, bodily, intellectual, and moral” (Kropotkin, 1989: 75).

Kropotkin’s theory was based in an organic unity of sociality (mutual aid), justice (equity), and morality, which he saw as being unique to humans and was expressed through beneficence and magnanimity (Morris, 2002: 425). The idea of justice, he

believed, comes from a sense of personal dignity and this feeling becomes generalized into a feeling of “human dignity” through association with others (Kropotkin, 1992: 273). In a society based on the principles of equality and justice, Kropotkin believed that individuals would learn to see the repercussions of their actions on the whole of society, even if it meant restricting one’s personal needs (Padovan, 1999).

In the previous Chapter, we encountered many of the elements of mutual aid in Delicias. Following the earthquakes, community members’ began to demonstrate a greater sense of concern towards their neighbours. They began to involve themselves in the ADESCO by taking part in small-scale projects like barricading the walls in the community that were situated on the edge of hills and were most vulnerable to collapse should another earthquake strike the region. This concern fostered greater sociability among community members, who began to see beyond previous political divisions that divided them into opposing camps. In turn, this sense of sociability paved the way for the cooperative, reciprocal relationship necessary to achieve common ends through common effort, as Kropotkin witnessed in Siberia. It also laid the groundwork for bigger projects to come that required greater effort and broader participation. Community members were able to endure the physical and financial burden that their water project initially brought about because they were beginning to learn how to share the burden equally and because they were beginning to realize a collective effort was the only way of achieving what divided communities could not.

IV Alternatives to the Tragedy of the Commons

For decades, policy makers have been persuaded by the theoretical neo-Malthusian arguments of authors like Hardin (1965) and Olson (1965). Policy in the developing world has therefore been devised either by those who mistakenly believe that only a central authority such as the state is competent enough to protect the commons or on the other hand, by neoliberals, espousing the so-called English Doctrine, who presume that a competitive private property regime is the backbone of any sophisticated society. Over the past two decades however, there has been a substantial amount of research demonstrating that both of these perspectives are incorrect. Toward the end of the 1980s and early 90s, the research of Robert Wade (1988), Daniel Bromley (1989), and Elinor Ostrom (1990) began seriously to challenge the notion that only a state or private-property approach to managing the commons is feasible. The in-depth review of the literature produced on the commons by Baland and Platteau (1996) only serves to confirm their argument.

Much of the confusion over “the tragedy of the commons” has been due to the lack of understanding of the concept of “property”. This in turn, has resulted in a failure to understand common property regimes (Bromley, 1989). A distinction must be drawn between “common-property resources” and “no-property resources” or “open-access resources”. In the latter case, nobody owns the resource and there is “unrestricted access”, meaning that nobody can be excluded. Or to put it another way, it is a “free-for-all”. This may be the case with questions of pollution or some fisheries, but not so when we are discussing a potable water system. Even still, it has not stopped academics and policy makers from over-generalizing the no-property scenario to include common-

property scenarios, where the model is not applicable (Wade, 1988). In reality, common-property resources entail specific rules that define who has the right to use a resource, who does not, and what the rules are for those involved (Bromley, 1989).

In Delicias we encounter a common-property system where the rules, although quite simple, are clearly defined. Those who could access potable water from the system had to live within one of the four communities involved in the project; they had to have contributed US \$140 toward the credit provided by Amanco; they had to dedicate one day a week to excavation, or pay the \$5 fine for everyday missed; they had to participate on one of the three committees during planning and implementation of the project; and they had to pay a predetermined monthly fee of \$6 for up to 16m³ water, with the cost rising progressively where consumption exceeded an agreed amount. Water consumption was metered to avoid any confusion or free-riding. The possibility for other households within the four communities to join later was left open, but only at a higher cost. No other group was permitted to access water from the system, and the community's willingness to defend their common-property was made perfectly clear when they confronted ANDA for trying to drill another well too close to the aquifer used by the system.

Researchers identify several other conditions that would either need to be pre-existing or put in place for collective management of common-property resources to be successful. One specific condition that Wade (1988) suggests must exist is that there is some sort of mechanism of coercion. Another necessary component that Wade identifies is that there must be a sense of obligation to the good of the community and the institutions it creates. This has to exist in the sense of a moral obligation to other community members. Ostrom (1990) identifies five essential conditions that must be met

for common-property resources management to operate successfully. First of all, like Bromley and Wade, she maintains that it is necessary to clearly define who is entitled to use the CPR in question. Second, the rules put in place would have to be appropriate for both the resource as well as the community in question, meaning that generic rules are not appropriate for all situations. Third, guidelines would have to be designed by the users themselves, at least in part. Fourth, rules would have to be designed for monitoring the use of the CPR by the users and those doing the monitoring would have to be accountable to these parties. Fifth, repercussions would have to be clearly set out in advance for those who chose not to comply with the pre-designed agreement. If these criteria are met, and the benefits outweigh the individualistic approach, Ostrom concludes that collective management of common-pool resources can be achieved.

In Delicias, all of these conditions exist. Wade's concerns regarding feelings of obligation towards the community are addressed by sociability and reciprocity which have already been discussed above, and do not need to be further elaborated upon here. The same applies to the issue of clearly defining who has the right to use a CPR—it has already been discussed above. The other three conditions identified by Ostrom are essentially all linked. Monitoring consumption of water has been dealt with adequately and intelligently in Delicias by the use of meters. Metering allows for water consumption to be monitored with precision and ease and also has the effect of balancing sustainability of the resource and the system itself, with people's ability to pay. Furthermore, it also clearly lays out the consequences of over consumption, which in this case can be understood as breaking the rules: those who over-consume pay a financial penalty. Those in control of the monitoring are accountable to the community as they are elected by the community members themselves, and are also in constant contact with the users. Finally,

community members were deeply involved in the design of the rules, as well as the water system, through participation in the three committees.

Although the work of these authors has contributed immensely to our understanding of the possibilities for managing the commons, the work is far from complete. To a large degree it is incomplete because proponents have been pre-occupied with proving *that* there are other options for managing common-pool resources, but have been unable to help our understanding of *why*. This is where the emerging field of cooperation in the evolutionary sciences has a role to play in the issue of the commons, as was noted by Dugatkin (1997) in Chapter 2.

V Restating the Question

More than a century after Kropotkin wrote *Mutual Aid* his central question reverberates through the fields of biology, politics and economics: that is, if life is such a brutal struggle, why do we encounter so much cooperation? Matt Ridley (1998) is even more emphatic, suggesting people are even “eager cooperators”. In a famous book on game theory, *The Evolution of Cooperation* (1984), Robert Axelrod opens by re-stating the question:

Under what conditions will cooperation emerge in a world of egoists without central authority?

This question has intrigued people for a long time. And for good reason. We all know that people are not angels, and that they tend to look after themselves and their own first. Yet we also know that cooperation does occur and that our civilization is based upon it. But, in situations where each individual has an incentive to be selfish, how can cooperation ever develop? (p.3).

Although his vision was much grander than solving a single problem such as managing the commons, Axelrod provided an opening for resolving this dilemma as well. He also created an opening whereby debates about cooperation no longer had to be held hostage to the political persuasion of whomever raised the issue, but through computer simulation he created the conditions whereby cooperation could be tested and measured. His conclusions were promising. He concluded that there were essentially two conditions necessary for cooperation to be successful: the first is reciprocity, and the second is that there must be a great enough possibility of a future encounter. If these two conditions are met, he concluded that cooperation can emerge. But Axelrod drew other important conclusions as well. That is, cooperation can emerge in small clusters; it can emerge without a central authority; altruism is not necessary; reciprocity can even persuade egoists to cooperate and; once cooperation has emerged, it can defend itself against penetration by egoists. Subsequent work in the field supports Axelrod's findings, which can serve as a basis for social planning (Singer, 1999).

In common usage, we think of cooperation as actions that help or support other individuals. In evolutionary biology, the focus is also on actions or traits that benefit other individuals, but with an emphasis on relative fitness. In common usage, we are concerned with the behavior itself, but in evolutionary biology the concern is with the outcomes of behavior. In the latter case, cooperative actions that benefit the recipient but harm the actor are considered to be altruistic, while actions that benefit both are considered to be mutualistic (Kappeler and Schaik, 2006). Until Darwin addressed altruism in honeybees in *On the Origin of Species*, the idea had been reserved for the realm of religion. Since then, the issue has been studied by a relatively small number of scientists beginning with Kropotkin (mutual aid), but since the 1960s by William D.

Hamilton (kin selection or inclusive fitness), Robert Trivers (reciprocal altruism) and Richard Dawkins (selfish genes) (see Dugatkin, 2006). The problem with most of this work is that it has looked at cooperation through the lens of the egoist. As altruism damages the relative fitness of the actor, it ran contrary to established facts demonstrating that the goal of evolution is to increase relative fitness, which is usually assumed to mean reproductive success. Yet, there was still no doubt that acts of altruism appear in nature. Hamilton's work on kin selection helped explain this seeming contradiction. According to Hamilton's rule (the theory named after its inventor), as kin share genes in common, they will act altruistically towards one another in order to ensure these genes are passed on to future generations. Looking at evolution from the level of genes influenced Dawkin's classic book *The Selfish Gene* (1989), which hypothesized that the engine of evolution is the gene's selfish goal of making copies of itself. From the 1960s through the 80s, this intensification of the "English doctrine" (discussed above) led evolutionary biologists to consistently attack any reference to group selection as it presumed altruism can exist without kin-selection. However, Alexander J. Field (2004) has tried to clarify this erroneous view reminding us that if an action that benefits others also benefits the actor, it is not altruistic, but mutualistic.

VI The New Science of Cooperation

Cooperation, in both the natural and the social sciences, faces a central problem: the cooperator is susceptible to exploitation by a selfish partner. The opportunity to be exploited can arise from the time delay inherent in reciprocal actions that provide the benefactor of a cooperative act with a chance to renege on her/his responsibility to

reciprocate, or giving back less than what was received. Cooperators can also be exploited through free-riding. That is, where an individual does not contribute equally or fairly to the creation or maintenance of a shared good or benefit. Finally, exploitation can arise when risk-taking is not shared equally (Kappeler and Schaik, 2006).

These are the same concerns that arise with the collective management of common-property resources. Free-riding on the work of others is a central concern to the management of the commons and this is why punishment of rule violation is often seen as such a key part of the solutions proposed by many contributors to the literature on common-property resources such as Wade (1988) and Ostrom (1990). If there is no way of dealing with rule violators, then there is a strong possibility that a common-property resource like potable water will be over-exploited and the group will suffer for the abuses of a few. In Delicias, several measures were implemented in order to deter free-riding. For example, those that did not show up to excavate on their designated day were fined \$5—a significant amount for a poor family. Water meters were also installed in every home to keep wastefulness in check and prevent the exhaustion of the aquifer. Furthermore, although families that did not participate in the water project are provided to join the network, they would be charged a higher fee than those that were involved from the beginning because the work is now complete.

Despite all the challenges faced by cooperation, human beings still cooperate more often than they go it alone. Furthermore, they will do so with non-kin or even strangers, and even when the level of risk is quite high (Kappeler and Schaik, 2006). In order for this to occur, trust is a very important ingredient. This helps to explain why the concept of social capital has become so popular in the literature on community development and the commons. Without trust, the norms necessary for sharing resources

in an equitable and sustainable manner would never be able to develop, because transaction costs—in terms time and money—would be far too high due to the fact that every interaction would require extensive negotiation of the rules. Therefore, it is necessary for trust to emerge in a commons so that those living together in a bounded community are able to cooperate to achieve a common goal. Cooperation brings about certain rewards meaning that community members have to make a considerable investment in their personal reputation in order to be perceived as cooperators and receive the associated rewards (Fukuyama, 2000).

Just a short distance from Delicias, the community of Animas has been struggling for years to get their own water system. However, they have made little progress due to political divisions. Community members that support one political party refuse to work with community members who support another party, even to achieve such a basic and vital goal as gaining access to potable water. The level of trust within the community in Animas is extremely low, with each group blaming the other for not supporting their activities. The level of distrust and animosity was so high in Animas that focus groups had to be held separately between groups that supported different political parties. One of the groups even insisted that focus groups be held in a secret location for fear that the other group would find out what their plans for developing a water system were. At times it was even difficult to get participants to speak about certain issues because they feared the focus group was being infiltrated by supporters of the other party who would then relay the information they had gained back to the opposing group. The complete lack of trust in Animas is not at all conducive to the level of sociability required for cooperation to emerge, and the result is that community members are still dependent on traditional sources of potable water that Delicias has outgrown (FG 1, 4, 6 and 7 Jan.-Mar. 2006).

While trust may be necessary for cooperation to emerge, however, it is not sufficient in and of itself. Social capital advocates have begun to recognize that people may have high levels of trust, but still be socially inactive—or worse still, antisocial. Therefore, Putnam has begun to shift the emphasis of his work on social capital more toward reciprocity. He argues that reciprocity is “so fundamental to civilized life that all prominent moral codes contain some equivalent of the Golden Rule”. However, he still argues that trust “lubricates social life” and creates a kind of generalized reciprocity which is the touchstone of social capital (Putnam in Schuller *et al*, 2000: 11).

Renowned bioethicist Peter Singer (2004) concurs with Putnam’s take on the value of reciprocity, suggesting that there is nothing utopian or idealistic about it at all. In fact, it is a universal and “common to ethical systems everywhere”. Singer argues that the idea of reciprocity could even be considered a distinct principle that goes beyond how others have treated you in the past (p.141). This is a very important point, because as Hauser (2006) hypothesizes, universals “often provide the signature of a common biological mechanism, part of the species’ genetic heritage” (p.410). In other words, as Kropotkin had argued over a century earlier, reciprocity is hardwired into our genetic make-up and not at all contrary to human nature. It is part of the tool kit evolution has equipped us with and it is important we realize it is there so we can draw upon it when it is the most appropriate tool for the job.

But it is important not to fall victim to the naturalistic fallacy. That is, arguing that something is good on account of the fact that it is natural. There are many things in the world that are perfectly natural that we have no need to consider good—diseases, for example. On the other hand, many things that are not natural, such as vaccines *are* good. But reciprocity is clearly a key ingredient to human sociability and cooperation. It faces

plenty of challenges however, and it should not be assumed that it will inevitably evolve. A conscious effort is necessary to facilitate its success, even in rural communities where people are less transient and have a long history of bonds, often going back several generations.

Milinski (2006) also points to recent research that has shown through experimentation that cooperation can evolve through indirect reciprocity, whereby one is able to build up a positive reputation or “image score” by helping those that may not necessarily be able to reciprocate in the future and a negative image score by refusing help. “If one helps those who have helped others,” Milinski writes “one helps those who have a reputation for helping. Third parties reciprocate the altruistic act” (p.266). He concludes that the desire to maintain a positive reputation may even be able to serve to maintain contributions to a public good in the absence of punishment, even among selfish agents.

In order to protect us from selfish partners, humans have evolved unique psychological mechanisms to detect cheaters and rely on reputation to gauge the quality of potential partners. At the same time, these mechanisms create a sense of gratitude upon receiving support, a sense of guilt for cheating or free-riding, and an urge to dole out “altruistic punishment”²¹ to check the defection tendencies of partners. Kappeler and Schaik (2006) argue that the scientific evidence suggests these mechanisms are controlled by emotions which serve to “achieve the optimum (‘rational’) outcomes without explicit reasoning or calculations” (p.16).

²¹ An example of an altruistic punishment would be when a cooperator pays a personal cost in order to inflict a greater cost on a cheater or rule breaker.

It is not being suggested here that we should always act upon our emotions, as they can be damaging as well as helpful. This is where our analytical abilities need to be allowed to intervene to bring about the optimal result. What is being suggested is simply that emotions have evolved to protect our relative fitness and can play a role in guiding cooperative action. The point is not that evolution necessarily tells us what is right or natural, but simply that it tells us *why we do what we do* (Mace, 1999). Once we have a better grasp on why we act in the way we do, we are far better positioned to determine what can reasonably be done.

Although Kropotkin may have been overly optimistic about the human propensity for cooperation, the self-interest hypothesis put forth by many scientists and social scientists is not consistent with the evidence demonstrating a level of cooperation among human beings with non-kin that is unprecedented in the animal kingdom. The division of labour, voting, donations to charities and environmental activism all indicate that we are not the egoists that we are often portrayed to be. Although it must be recognized that people do not cooperate in all situations, Gächter and Herrmann (2006) report that causal evidence from their experiments in social dilemma games suggest that this has to do with the fact that people want to avoid being the “sucker”. The authors therefore conclude that people are “conditional cooperators who cooperate if others cooperate” (p.290).

VII Toward a New Vision of Community Development

The community water project implemented in Delicias is an interesting case because it refutes both the Hobbsian notion that only a central authority can prevent people from tearing each other limb from limb, while at the same time it refutes a default

acceptance of the English doctrine. It demonstrates that human beings do have the capacity to cooperate in order to achieve common ends, but at the same time it also shows that cooperation requires a conscious effort in order to be successful. Community members in Delicias did not get out of bed each morning without ever facing the temptation to renege on their excavation duties. Nor did they hand over their hard earned \$12 every month for an entire year without ever considering spending it on something that would bring immediate gratification. It took a conscious effort to ensure that the conditions were in place to induce cooperation and deter free riding. It is not enough to simply say that because we have naturally cooperative behaviors we will automatically cooperate in any given situation. We have many different behavioral repertoires emerging from our evolution, each of which has the potential to express itself when the right opportunity arises. In many instances the odds are stacked against the emergence of cooperation, so if we are to capture and harness our cooperative inclinations over our competitive inclinations, strategies to induce cooperation need to be formulated.

There is no special quality possessed by the people of Delicias that has resulted in them working in cooperation with one another. They are not “noble savages” living in harmony with their natural environment. They have their traditions, just like we do, but they have sense enough to know that they sometimes need to seek expertise outside of their community and introduce new ideas in order to move forward. They value their way of life and their sense of community, but they also value progress and want a better future for their children.

Susan George (1998) cautions against idealizing “commoners”, dependent on common-property resources in the developing world as “nicer and worthier than the rest of us. They’re not. They simply didn’t need to read Matt Ridley’s *The Origins of Virtue*

to realize which side their bread is buttered on". She argues that cooperative management of common-property resources serves as "enlightened self-interest" whenever an individual intends to interact as part of a group for any length of time, because you can cheat a person you have a single interaction with, but not if you're dealing with them on a daily basis. "In that case, cooperation and reciprocity are the only strategies for guaranteeing your own survival, much less prosperity" (p.xii).

Although there are still many obstacles to collective action in a rural community such as Delicias, they are in a far more advantageous position to benefit from a community development project than in a city where there are fewer established bonds. It is far more probable that the long history and close ties often found in rural areas will result in sociability than in the anonymous streets of a city. Therefore, in Shiva's (2005) view, the communitarian approach to development offered by mutual aid is a logical model for rural people because the principle of cooperation still dominates in large sections of rural developing world communities. She argues that the poor in these areas simply could not survive if they were unable to participate in economies of mutuality and cooperation. Although Shiva has a tendency to romanticize the rural poor in the developing world, her point in this case is quite valid.

For decades, even centuries, it has been erroneously assumed by scientists and social scientists subscribing to the English doctrine that individuals are unmotivated by the desire to help others. But they can be motivated if certain conditions are met that can allow cooperation to prove successful. Singer (1999) posits that one such condition is that the sacrifice demanded of the actor not be overly burdensome. Although the amount of physical labour and the financial burden experienced by the families in Delicias over

the two years it took to complete the project was significant, overall it has lessened the burden they previously had to endure.

Steven Pinker (2002) concludes similarly to Singer, adding that experiments have confirmed that we are more likely to help someone (even strangers) when there is an opportunity for reciprocation. Furthermore, Pinker suggests that we favor those who grant us favors and who grant favors to those we like, and punish those who withhold favors from others. In other words, as Axelrod has suggested, reciprocity is the key for cooperation to evolve. We must also recall Axelrod's second condition for cooperation to evolve: the shadow of a future encounter must be great enough that actors will feel the need to cooperate. In Delicias, these were the basic ideas motivating the project. Households were expected to work and to help finance the project, but it was done under the condition that other household would share the burden and the responsibility. Community members did not tolerate the free-riding by others and processes were put in place to prevent it from threatening their project. These are the key reasons why Delicias has achieved their dream of gaining access to potable water, while other communities such as Animas have not.

As an analytical concept, mutual aid surpasses the usefulness of such terms as social capital and participation because it has the ability to challenge theories based in competition on scientific grounds. Social capital and participation may be useful concepts because they explain the "how" of cooperation. But mutual aid takes us to the next level, because it helps us understand the "why".

Chapter 5—Conclusion

The people of Delicias have abandoned the English doctrine, proving beyond a reasonable doubt to everyone caring to see that reciprocity and sociability truly are at the heart of our social interactions and that they provide the basis of community development and progress. But this must be broadcast on a scale equal to conceptions of development based on the fundamentals of competition and egoism. Conditions have to be consciously created that reward cooperative attitudes and punish anti-social attitudes. If the proper conditions are not consciously created, those serving to gain from divisive political attitudes will fill the vacuum, preventing common ends from being achieved. This is what we see in many communities throughout El Salvador that are unable to cooperate even if it means they are prevented from gaining access to something as vital as potable water. In fact, one does not have to travel far to find this. It exists right in Santa Cruz Michapa where communities like Animas are divided along political party lines, so that supporters of one party feel compelled to hold their meetings in secret locations for fear of having their efforts undermined by those preferring to see them fail on their own than to succeed as a community unit. Sadly, none of the parties they support have ever brought them the benefit of water they so desperately need to develop their community. Divided communities could learn a lot from their cooperative neighbors in Delicias, if they would only open their eyes and see the results that mutual aid has produced for them.

Human beings belong to a category of animals referred to by zoologists as “obligatorily gregarious”. In short, living together is not optional; we have evolved to possess permanent features of complex sociability. This is why we feel such a strong

urge to fit in and be accepted, and are so terrified of being ostracized (Waal, 2005).

Cooperation is not learned, we are born with it and as we use it more it grows stronger just as our arms and legs grow stronger the more we use them for physical activity.

Despite our delusions of self-sufficiency, there are very few things we can actually achieve without the help of others—and we usually experience far greater success as a group. Since splitting off with our simian ancestors some six million years ago, human beings have built a social fabric so incredibly complex and highly integrated that it is practically impossible for us to remove ourselves from it for any length of time. Some might attempt to counter such an argument, pointing to the fact that we frequently seek seclusion and try to remove ourselves from the buzz of social life, but we would have to remind them that we always return when we need something and we never stay away too long. It is this periodic yearning for freedom from belongingness that in reality testifies to the extent and more or less permanent condition of human social embeddedness.

Matt Ridley (1998) estimates that it has probably been a million years since human beings have been able to survive without trading their skills between one another and that this likely explains why we define virtue almost entirely in terms of pro-social behavior and vice as anti-social behavior. “One of the things that marks humanity out from other species, and accounts for our ecological success, is our collection of hyper-social instincts” he concludes (p.6). Without the assistance of others, we have trouble feeding ourselves, we have trouble providing ourselves with shelter, we never would have accumulated the mass of knowledge we now possess and we certainly would not be able to guarantee that our genes are passed on to future generations.

Mutual aid goes to the very roots of our biological make-up. To put it in terms of evolution, it is about the relative fitness of our species. A group such as the community of Delicias is fitter, relative to another like Animas because they are able to cooperate in ways that bring about benefits that can not be secured through individual effort. Delicias is becoming better adapted to their natural, social and economic environment, which offers them better chances of survival and to pass on their genes (writ large) to new generations of Delicians. This community will grow stronger and prosper, while other communities will diminish as their inhabitants move to the cities or emigrate to the U.S.

There are several conclusions that can be drawn from the research presented in the previous Chapters. These can be directed toward three separate, but interconnected groups: the academic community; the development community; and the policy community.

The most important conclusion answers the thesis question posed in the first chapter, and can be directed toward all three groups: that is, that mutual aid is a valuable analytical and operational concept for discussing community development and the management of common-property resources. Although participation and social capital are popular concepts, mutual aid surpasses them because it goes beyond questions of *how* collective management works to answer *why* it works. It is able to do this because it breaks away from the limitations inherent in the social sciences literature by merging it with the natural sciences—especially evolutionary theory.

Social scientists and natural scientists that draw a distinction between their respective disciplines do so to their peril. Both disciplines have their virtues, but they also have their vices and this can only be reconciled by merging the two fields to draw insights that neither can produce on its own. As we saw in the last Chapter, the fear of evolution held

by social scientists and environmentalists alike is entirely unfounded. What is more, it is counterproductive. The dichotomy between good and evil, cooperation and competition is a false one that is better left to collect dust on the shelf. The reality is that evolution allows for a range of possibilities from altruism to bloody warfare. The field of international development needs to learn from the new science of cooperation emerging in evolutionary studies in order to harness it and foster progress, because if it does not, those espousing the English doctrine will surely succeed in convincing each and all that nature truly is the gladiator's show Huxley portrayed it to be.

It is important that both researchers and policymakers look more closely at the value of mutual aid as a concept because it contains a strong capacity for providing greater insight into, and more accurate explanations of, the complex realities research deals with. It has the ability to take them *beyond* abstract concepts like participation and social capital and into the realm of something more tangible and scientifically grounded. With the knowledge of what does and does not facilitate cooperation, we create the possibility of making cooperative activities stronger. Game theory has taught us that what is useful about the study of cooperation is the knowledge of what it will take to get people to mutually cooperate in a particular setting. More promising still, is "if the facts of Cooperation Theory are known by participants with foresight," Axelrod (1984) concluded more than two decades ago "the evolution of cooperation can be speeded up" (p. 24). Knowledge of mutual aid could have the same effect on community development.

As noted in Chapter 2 (Brett, 2003), there has been a profound revolution in development thinking in the past few decades. But the revolution is far from complete. Major development agencies are slowly coming to the realization that they can not simply

walk into a community and wave a magic wand in order to make people work together to better their lives. So they have begun to look at concepts like participation and social capital to analyze and facilitate the much needed cooperation required for community development projects to succeed. They have realized that participation deepens democracy, it lessens the chances that corruption will emerge and it creates a sense of ownership over the project that encourages beneficiaries to defend it wholeheartedly. They have also begun to better understand the value of trust and social networks in facilitating cooperation and progress. But while these conditions might be necessary for community development to prove successful, they are not sufficient. Something has been lacking from the discussion, and as we have seen in the previous pages, that something is what Kropotkin called mutual aid. Development agencies and the NGOs they fund would do well to learn more about it, so that they can find new ways to apply it to their own programs and projects on the ground.

A mutual aid approach to community development would not have to be strictly limited to the management of potable water. It can be used for the management of practically any common-property resource, be it agriculture, fish, forests or an irrigation system. Essentially, the same overarching rules apply to any of these because they are all based on the idea of collective action for collective gain. The focus is not so much on the resource itself as it is on human social activity surrounding it.

Policy makers need to take a closer look at the value of mutual aid too. This is certainly the case in El Salvador, as we have seen in the preceding Chapters. Local development institutions like the Fondo de Inversión Social para el Desarrollo Local (FIS-DL) should incorporate educational programs on mutual aid into their projects to teach local populations how it can be operationalized to meet local conditions and needs.

Of course, this will not be the same in every case, but certain general guidelines can be devised as a point of departure.

First of all, FIS-DL can assist local populations to set up small-scale institutions that focus on specific issues of common interest and that revolve around the creation of sociability and reciprocity. By dividing issues along common interest, communities will be able to see more clearly that they need to work together to improve their quality of life. Within these institutions, committees would need to be created that are divided along the lines of particular tasks for addressing the broader issue identified by the community institution. To the greatest extent possible, the tasks should be divided in ways that require constant interaction and input by other group members, and not in a ways that force them to work in isolation, only to return to the group when their particular task is complete. Tasks and responsibilities should not be created in a way that separates members from the group for long periods of time whereby they can not depend on their fellows for assistance in achieving the goals of the group. Isolation will give people the impression that their individual task is independent of the rest of the group, making it harder to achieve common ends.

The committees created should be set up on a rotational basis so that there is continual interaction with different members of the community. This will help instill a sense of sociability among community members and help them to realize the value and necessity of the group as a whole, their dependence on the group and the group's dependence on them. Furthermore, tasks should be set up in a way that fosters reciprocity. This means not assigning tasks and responsibilities upon particular individuals that are overly burdensome. If particular individuals or groups of individuals are constantly suffering the burden of the group's work, they will grow resentful and begin shirking their

responsibilities in order to curtail free-riding by others, putting community projects in jeopardy.

One serious obstacle that often presents itself to the emergence of sociability and reciprocity—particularly in rural areas—is the isolation created by the geographic conditions. Despite the fact that people may technically belong to the same community, if they live a considerable distance apart or live on the opposite side of a river from where community meetings and activities take place, a serious burden is created that challenges the emergence of sociability and reciprocity. If community members feel that the effort of getting to a community project is as great as the work itself, this double's the effort demanded of them and will likely result in their eventual withdrawal from community life. Therefore, an effort must be made to create easier travel conditions for community members that are separated from where community gatherings take place. This could be done by directing funds toward subsidizing the gas of community members that have a vehicle, so that they can shuttle people back and forth from their homes. It could also mean that community projects would need to be implemented to improve road conditions and/or construct bridges that will link a community divided by a river.

Finally, whenever possible, community members from past successful projects should be brought into new development projects in other communities. Incorporation of previous project beneficiaries should be programmed into the design of any project in the same way that participation and gender are programmed into project plans now. This is important because it is one thing to teach people how to work together when the teacher is present, but it is another for them to know how to maintain the relationship once the teacher is gone. By involving community members from past projects, they will be able to learn how other communities were able to resolve their disputes from those that have

already done so. Furthermore, it will provide living proof of mutual aid to those that have never heard of it and facilitate its dissemination by the actors themselves, rather than just by the teachers.

Policy makers and those hired to implement their projects should not ignore the divisions that emerge during such projects, they should acknowledge and address them to make future projects better, ensuring that each time mutual aid is incorporated into a project it takes off at a higher level. If these guidelines are followed, policy makers should be able to lay the groundwork for operationalizing mutual aid and instilling it in the daily lives of communities more generally. In this respect, Delicias serves as a model of what can be achieved when mutual aid becomes the centerpiece of community empowerment.

References

- Agrawal, Arun (2003). "Sustainable Governance of Common-Pool Resources: Context, Methods, and Politics". *Annu. Rev. Anthropol.* 32: 243-62.
- Agrawal, Arun and Clark C. Gibson (2004). "Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation". *The Earthscan Reader in Environment, Development & Rural Livelihoods*. Edited by Samantha Jones and Grace Carswell. London: Earthscan: 151-79.
- ANDAR (Asociación Nacional para la Defensa, Desarrollo y Distribución de Agua a Nivel Rural) (2005). "Información ANDAR".
- Anderson, Terry L. and Pamela Snyder (1997). *Markets: Priming the Invisible Pump*. Washington, D.C.: Cato Institute.
- Anton, Danilo J. (1993). *Thirsty Cities: Urban Environments and Water Supply in Latin America*. Ottawa: International Development Research Centre (IDRC).
- Arnold, Guy (1996). *Historical Dictionary of Aid and Development Organizations*. International Organizations Series, No. 10. London: The Scarecrow Press, Inc.
- Axelrod, Robert (1984). *The Evolution of Cooperation*. Basic Books.
- Baland, Jean-Marie and Jean-Philippe Platteau (1996). *Halting Degradation of Natural Resources: Is there a Role for Rural Communities?* Oxford: Clarendon Press for the Food and Agricultural Organization.
- Barkin, David (2001). "Neoliberalism and Sustainable Popular Development." In *Transcending Neoliberalism: Community-Based Development in Latin America*. Edited by Henry Veltmeyer and Anthony O'Malley. Bloomfield, CT: Kumarian Press: 184-204.
- Barlow, Maude and Tony Clarke (2002). *Blue Gold: The Battle Against the Corporate Theft of the World's Water*. Toronto: Stoddart.
- Barry, Deborah (1994). "El Agua: Límite ambiental para el desarrollo futuro de El Salvador". PRISMA (Programa Salvadoreño de Investigación Sobre Desarrollo y Medio Ambiente". No. 5, Enero-Marzo.
- Biel, Robert (2000). *The New Imperialism: Crisis and Contradictions in North/South Relations*. London: Zed Books.
- Binmore, Ken (2007). *Game Theory: A Very Short Introduction*. Oxford: Oxford University Press.
- Biswas, Asit K. (2005). "An Assessment of Future Global Water Issues". *Water Resources Development*. Vol. 21 No. 2: 229-37.
- Black, Maggie (2004). *The No-Nonsense Guide to Water*. Toronto: Between the Lines.
- Botes, Lucius and Dingie van Rensburg (2000). "Community participation in development: nine plagues and twelve commandments". *Community Development Journal*. Vol. 35 no. 1 January: 41-58.
- Brannstrom, Christian (2004). "Decentralising Water Resource Management in Brazil". *European Journal of Development Research*. Vol.16 No.1. Spring: 214-234.
- Brett, E.A. (2003). "Participation and Accountability in Development Management". *The Journal of Development Studies*. Vol. 40 No. 2. December: 1-29.
- Brooks, David B. (2002). *Water: Local-Level Management*. Downloaded 15 November, 2007: <http://www.idrc.ca/openbooks/996-8/>
- Bromley, Daniel W. (1989). "Property Relations and Economic Development: The Other

- Land Reform". *World Development*. Vol. 17, No. 6: 867-877.
- Browning, David ([1971]1998). *El Salvador, La Tierra Y El Hombre*. Cuarta Edicion. Coleccion Biblioteca Popular No. 49. San Salvador: Direccion de Publicaciones e Impresos.
- Burger, Joanna and Michael Gochfeld (1998). "The Tragedy of the Commons: 30-Years Later". *Environment*. Vol. 40 No 10. December: 4-27.
- CARE El Salvador (2003). "Prosalud Linea Base de Comunidades del Proyecto El Centro, Santa Cruz Michapa". Agosto.
- (2005) Una manera efectiva para lograr financiamiento local para realizar programas de salud.
- Carmen, Raff (1996). *Autonomous Development*. London: Zed Books.
- CESTA (Centro Salvadoreño de Tecnología Apropiada) (2005). *La Gestión Sustentable del Agua*.
- (2004) "Diagnóstico Social y Ambiental, en relación al Agua, de Municipio de Santa Cruz Michapa Departamento de Cuscatlán, Agosto.
- Chambers, Robert (2007). "Participation and Poverty". *Development*. 50(2): 20-25.
- Chang, Ha-Joon (2003). *Kicking Away the Ladder: Development Strategy in Historical Perspective*. London: Anthem Press.
- CEAA (Comision Especial de Abastecimiento de Agua) (2000). "El Abastecimiento del Agua Potable en San Salvador".
- CIA (Central Intelligence Agency). *The World Factbook: El Salvador*. Downloaded 12 March 2008:
<<https://www.cia.gov/library/publications/the-world-factbook/geos/es.html>>
- Cooke, Bill (2001). "The Social Psychological Limits of Participation?" *Participation: The New Tyranny?* Edited by Bill Cooke and Uma Kothari. London: Zed Books: 102-38.
- Cowen, M.P. and R.W. Shenton (1996). *Doctrines of Development*. London: Routledge.
- Cuellar, Nelson y Silvia de Larios (2001). *Acceso al agua potable en El Salvador: Tendencias, perspectivas y desafios*. Programa Salvadoreño de Investigación Sobre Desarrollo Medio Ambiente (PRISMA). No. 42.
- Daly, Herman (1993). "Sustainable Growth: An Impossibility Theorem". In *Valuing the Earth: Economics, Ecology and Ethics*. Edited by Herman E. Daly and Kenneth N. Townsend. Cambridge MA: MIT Press: 267-74.
- Darwin, Charles ([1859] 1998). *The Origin of Species by Means of Natural Selection or the Preservation of Favored Races in the Struggle for Life*. New York: The Modern Library.
- ([1871] 2007). *The Descent of Man, and Selection in Relation to Sex*. New York: Plume.
- Dawkins, Richard ([1976] 1989). *The Selfish Gene*. Oxford: Oxford University Press.
- De Soto, Hernando (2000). *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. Basic Books.
- De Villiers, Marq (2001). *Water: The Fate of Our Most Precious Resource*. Boston: A Mariner Book.
- Dickson, Anna K. (1997). *Development and International Relations: A Critical Introduction*. Cambridge: Polity Press.
- Dore, Ronald and Zoe Mars (1981). "Community Development in the 1970s". Edited by Ronald Dore and Zoe Mars. UNESCO Paris:

- 13-46.
- Dugatkin, Lee Alan (1997). "The Evolution of Cooperation: Four paths to the evolution and maintenance of cooperative behaviour." *BioScience*. Vol.47 No.6. June: 355-62.
- (2000). *Cheating Monkeys and Citizen Bees: The Nature of Cooperation in Animals and Humans*. New York: The Free Press.
- (2006). *The Altruism Equation: Seven Scientists Search for the Origins of Goodness*. Princeton: Princeton University Press.
- Dunkley, Graham (2004). *Free Trade: Myth, Reality and Alternatives*. London: Zed Books.
- Easterly, William (2006). *The White Man's Burden: Why the West's Efforts to Aid the Rest Have Done So Much Ill and So Little Good*. New York: The Penguin Press.
- Ehrlich, Paul R. (2002). *Human Natures: Genes, Cultures, and the Human Prospect*. New York: Penguin Books.
- Esteva, Gustavo (1992). "Development". In *The Development Dictionary: A Guide to Knowledge as Power*. London: Zed Books Ltd.: 6-25.
- Esteva and Prakash (1998).
- Field, Alexander J. (2004). *Altruistically Inclined?*. Ann Arbor: The University of Michigan Press.
- Frank, Andre Gunder (1966).
- Fry, Gerald W. and Galen R. Martin (1991). *The International Development Dictionary*. Santa Barbara, California: ABC-CLIO.
- Fukuyama, Francis (1989). "The End of History?" *The National Interest*. 16. Summer: 3-18.
- (1992) *The End of History and the Last Man*. New York: Avon Books, Inc.
- (2000). "Social Capital". In *Culture Matters: How Values Shape Human Progress*. Edited by Lawrence E. Harrison and Samuel P. Huntington. New York: Basic Books: 98-111.
- FUSADES (Fundación Salvadoreña para el Desarrollo Economico y Social) (2001). "Determinación de la Calidad del Agua de Consumo Humano de las Familias Rurales: Estudio Socioeconómico".
- Gächter, Simon and Benedikt Herrmann (2006). "Human cooperation from an economic perspective". In *Cooperation in Primates and Humans: Mechanisms and Evolution*. Edited by Peter M. Kappeler and Carel P. van Schaik. New York: Springer: 280-301.
- George, Susan (1998). Preface to *Privatizing Nature: Political Struggles for the Global Commons*. Edited by Michael Goldman. New Brunswick, NJ: Rutgers University Press.
- Glassman, Michael (2000). "Mutual Aid Theory and Human Development: Sociability as Primary." *Journal for the Theory of Social Behaviour*. 30:4: 391-412.
- Gleick, Peter H. (2001). "Water: Threats and Challenges Facing the United States". *Environment*. Vol.43 No.2. March: 19-26.
- Godfrey, Sam (2005). "Is Your Drinking Water Safe?" *Waterlines*. Vol.23 No.4 April: 2-3.
- Gordon, H. Scott (1954). "The Economic Theory of a Common-Property Resource: The Fishery". *Journal of Political Economy*. Vol. 62: 124-142.
- Gould, Steven Jay (1991). "Kropotkin Was No Crackpot." *Bully for Brontosaurus*:

- Reflections in Natural History*. New York: W.W. Norton & Company: 325-339.
- Hadjor, Kofi Buenor (1992). *Dictionary of Third World Terms*. New York: I.B. Tauris & Co. Ltd. Publishers.
- Hall, Anthony (1988). "Community participation and development policy: a sociological perspective". *Development Policies: Sociological Perspectives*. Edited by Anthony Hall and James Midgley. Manchester: Manchester University Press: 91-107.
- Hardin, Garrett (1968). "The Tragedy of the Commons." *Science*. Vol. 162. Issue 3859. 13 December: 1243-1248.
- Hardoy, Ana and Ricardo Schusterman (2000). "New Models for the Privatization of Water and Sanitation for the Urban Poor". *Environment & Urbanization*. Vol.12 No.2. October: 63-75.
- Harrison, Lawrence E. (2000). "Culture Matters". *The National Interest*. Summer: 55-65.
- Harriss, John (2005). "Great promise, hubris and recovery: a participant's history of of development studies". *A Radical History of Development Studies* Edited by Uma Kothari. London: Zed Books.
- Hauser, Marc D. (2006). *Moral Minds: How Nature Designed Our Universal Sense of Right and Wrong*. New York: Harper Collins.
- Hoering, Uwe (2002). "Public Private Partnerships in the Water Sector". *D+C (Development and Cooperation)*. April: 15-17.
- Hunt, Diana (1989). *Economic Theories of Development*. Lanham, MD: Rowman & Littlefield Publishers, Inc.
- Hunt, Constance Elizabeth (2004). *Thirsty Planet: Strategies for Sustainable Water Management*. New York: Zed Books.
- Huntington, Samuel P.(1993). "The Clash of Civilizations". *Foreign Affairs*. 72(3): 22-49.
- Huxley, Thomas H. ([1888] 1968). "The Struggle for Existence in Human Society". In *Evolution and Ethics: And Other Essays*. New York: Grove Press Publishers: 195-236.
- Iniciativa Agua 2015 (2006). *El Salvador*.
- Inocencio, Arlene B. (2003). "Public-private partnerships in Metro Manila, Philippines." *Waterlines*. Vol.21 No.3. January: 9-11.
- Kaplan, Robert D. (1994). "The Coming Anarchy: How Scarcity, Crime, Overpopulation and Disease are Rapidly Destroying the Social Fabric of Our Planet." *Atlantic Monthly*. February: 44-76.
- Kappeler, Peter M. and Carel P. van Schaik (2006). "Cooperation in primates and humans: closing the gap". In *Cooperation in Primates and Humans: Mechanisms and Evolution*. Edited by Peter M. Kappeler and Carel P. van Schaik. New York: Springer: 3-21.
- Kay, Cristóbal (1989). *Latin American Theories of Development and Underdevelopment*. New York: Routledge.
- Kearns, Gerry (2004). "The Political Pivot of Geography". *The Geographical Journal*. Vol. 170, No. 4. December: 337-346.
- Killen, Melanie and Marina Cords. (2002). "Prince Kropotkin's Ghost". *American Scientist*. Vol.90 No.3. May-June: 208-210.
- Kothari, Uma (2001). "Power, Knowledge and Social Control in Participatory

- Development". *Participation: The New Tyranny?* Edited by Bill Cooke and Uma Kothari. London: Zed Books: 139-52.
- Kropotkin, Peter ([1902] 1989). *Mutual Aid: A Factor of Evolution*. Edited by George Woodcock. Montreal: Black Rose Books.
- ([1892] 1994). *Fields, Factories, and Workshops*. Edited by George Woodcock. Montreal: Black Rose Books.
- ([1912] 2002). "Modern Science and Anarchism". In *Anarchism: A Collection of Revolutionary Writings*. Edited by Roger N. Baldwin. Mineola, New York: Dover Publications, Inc.: 146-194.
- ([1922] 1992). *Ethics: Origin and Development*. Edited by George Woodcock. Montreal: Black Rose Books.
- ([1903] 1970). "The State: Its Historic Role". *Selected Writings on Anarchism and Revolution*. Cambridge, Mass: MIT Press.
- Landes, David (1999). *The Wealth and Poverty of Nations: Why Some Are So Rich And Some Are So Poor*. New York: W.W. Norton & Company.
- Larson, Edward J. (2006). *Evolution: The Remarkable History of a Scientific Theory*. New York: Modern Library.
- Leach, Melissa, Robin Mearns, and Ian Scoones (1997). "Challenges to Community-Based Sustainable Development: Dynamics, Entitlements, Institutions". *IDS Bulletin*. Vol. 28 No.4: 4-14.
- Lee, Terence R. (1990). *Water Resources Management in Latin America and the Caribbean*. Studies in Water Policy and Management, No.16. Boulder, CO: Westview Press.
- Libiszewski, Stephan. "International Conflicts over Fresh Water Resources." In *Ecology, Politics & Violent Conflict*. Mohamed Sulliman ed. London: Zed Books Ltd.:115-138.
- Livingstone, David N (1992). *The Geographical Tradition*. Oxford: Blackwell Publishers.
- Luomo, Jon (2004). "The Water Thieves". *The Ecologist*. March: 52-59
- Mace, Ruth (1999). "Dos and don'ts, whys and wherefores". Review of *Ever Since Adam and Eve: The Evolution of Human Sexuality* by Malcolm Potts and Roger Short. *Nature*. Vol. 400. 8 July: 131-2.
- Malthus, Thomas. ([1798] 1970). *An Essay on the Principle of Population: and, A Summary View of the Principle of Population*. Harmondsworth: Penguin.
- Mansuri, Ghazala and Vijayendra Rao (2004). "Community-Based and -Driven Development: A Critical Review". *The World Bank Research Observer*. Vol. 19, No. 1: 1-39.
- MARN (Ministerio de Medio Ambiente y Recursos Naturales) (1998). "Conocimientos, percepciones y comportamientos sobre el agua para consumo humano en hogares rurales".
- (2000). *Informe Nacional: Estado del Medio Ambiente*. El Salvador. Centroamérica.
- (2002). *Informe Nacional: Estado del Medio Ambiente*. El Salvador. Centroamérica.
- Martinussen, John (1997). *Society, State & Market: A Guide to Competing Theories of Development*. Halifax: Fernwood Publishing.
- Marx, Karl ([1867] 2001). *Capital: A Critique of Political Economy, Vol.1*. London:

- Penguin.
- Mason, T. David (1986). "Land Reform and the Breakdown of Clientelist Politics in El Salvador". *Comparative Political Studies*. Vol.18 No.4. January: 487-516.
- Mason, Mike (1997). *Development and Disorder: A History of the Third World Since 1945*. Hanover: The University of New England.
- Maurits la Rivière, J.W. (1989). "Threats to the World's Water". *Scientific American*. September: 80-94.
- Menzel, Ulrich (2003). "Walt Whitman Rostow (1916-2003): A non-Communist man". *D+C (Development and Cooperation)*. Vol. 30 No. 12: 466-470.
- Merrett, Christopher (2000). "Teaching Social Justice: Reviving Geography's Neglected Tradition". *Journal of Geography*. No.99: 207-218.
- Mies, Maria and Veronika Bennholdt-Thompson (1999). *The Subsistence Perspective*. London: Zed Books.
- Milinski, Manfred (2006). "Reputation, personal identity and cooperation in a social dilemma". In *Cooperation in Primates and Humans: Mechanisms and Evolution*. Edited by Peter M. Kappeler and Carel P. van Schaik. New York: Springer: 265-78.
- Mohan, Giles (2001). "Beyond Participation: Strategies for Deeper Empowerment". *Participation: The New Tyranny?* Edited by Bill Cooke and Uma Kothari. London: Zed Books: 153-67.
- Molle, François (2004). "Defining Water Rights: By Prescription or Negotiation?" *Water Policy* (6): 207-227.
- Montaner, Carlos Alberto (2000). "Culture and Behavior of Elites in Latin America". *Culture Matters: How Values Shape Human Progress*. Edited by Lawrence E. Harrison and Samuel P. Huntington. New York: Basic Books.
- Morris, Brian (2002). "Kropotkin's Ethical Naturalism." *Democracy & Nature*. Vol.8 No.3: 423-437.
- Mason, Dana Gardner (1918). *The Five Republics of Central American*. New York: Oxford University Press.
- NACLA: Report on the Americas. "Water, Inc." Vol. 38, No.1. July/Aug, 2004.
- Nandy, Ashis. (1992). "State". *The Development Dictionary: A Guide to Knowledge as Power*. Edited by Wolfgang Sachs. London: Zed Books: 264-74.
- Nelson, Nici and Susan Wright (1995). *Power and Participatory Development*. Warwickshire: Practical Action Publishing.
- Ohlsson, Leif (1995). "Introduction: The Role of Water and the Origins of Conflict." *Hydropolitics: Conflicts Over Water as a Development Constraint*. Edited by Leif Ohlsson. London: Zed Books: 1-28.
- Olson, Mancur (1965). *The Logic of Collective Action*. Cambridge: Harvard University Press.
- Ostrom, Elinor (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. New York: Cambridge University Press.
- Padovan, Dario (1999). "Social Morals and Ethics of Nature: from Peter Kropotkin to Murray Bookchin." *Democracy and Nature*. Vol.5 No.3: 485-500.
- PAHO/WHO. (Pan-American Health Organization and World Health Organization) (2003). *Vulnerabilidad de los Sistemas de Abastecimiento de Agua Potable y Saneamiento en Áreas Rurales de El Salvador*.
- Petras, James and Henry Veltmeyer (2001). *Globalization Unmasked: Imperialism in the*

- 21st Century. Halifax: Fernwood Publishing.
- Petrella, Ricardo (2001). *The Water Manifesto: Arguments for a World Water Contract*. Halifax: Fernwood.
- Pinker, Steven (2002). *The Blank Slate: The Modern Denial of Human Nature*. New York: Viking.
- Postel, Sandra (1992). *Last Oasis: Facing Water Scarcity*. New York: W.W. Norton & Company.
- Putnam, Robert (1995). "Bowling Alone: America's Declining Social Capital". *Journal of Democracy*. 6(1): 65-78.
- Rabe, Hans-Joachim (2002). "Public Private Partnerships: A Model with a Future in Development Cooperation." *D+C (Development and Cooperation)*. April: 9-11.
- Rahman, Muhammad Anisur (1995). "Participatory Development: Toward Liberations or Co-option". *Community Empowerment: A Reader in Participation and Development*. Edited by Gary Craig and Marjorie Mayo. London: Zed Books: 24-32.
- Raines Ward, Diane (2002). *Water Wars: Drought, Flood, Folly, and the Politics of Thirst*. New York: Riverhead Books.
- Renner, Michael (1996). *Fighting for Survival: Environmental Decline, Social Conflict, and the New Age of Insecurity*. 2nd Edition. New York: W.W. Norton & Company.
- Riding, Alan ([1984] 1989). *Distant Neighbors: A Portrait of the Mexicans*. New York: Vintage Books.
- Ridley, Matt (1998). *The Origins of Virtue: Human Instincts and the Evolution of Cooperation*. New York: Penguin Books.
- Rijsberman, Frank (2003). "Can Development of Water Resources Reduce Poverty?" *Water Policy*. (5): 399-412.
- Rist, Gilbert (1997). *The History of Development: from Western Origins to Global Faith*. London: Zed Books.
- Rivero, Oswaldo de (2001). *The Myth of Development: Non-Viable Economies of the 21st Century*. Halifax, Nova Scotia: Fernwood Publishing Ltd.
- Ronsbo, Henrik (1997). "State Formation and Property – Reflections on the Political Technologies of Space in Central America". *Journal of Historical Sociology*. Vol.10 No.1. March: 56-73.
- Rostow, W.W. (1959). "The Stages of Economic Growth". *Economic History Review*. Second Series, Vol. XII No. 1: 1-16.
- Rothfeder, Jeffrey. *Every Drop for Sale*. New York: Jeremy P. Tarcher/Putnam. 2001.
- Sachs, Jeffrey (2005). *The End of Poverty*. London: Penguin Books.
- Sachs, Wolfgang ed. (1992). *The Development Dictionary: A Guide to Knowledge As Power*. London: Zed Books.
- Sahooly, Anwer (2003). "Public-Private Partnership in the Water Supply and Sanitation Sector: The Experience of the Republic of Yemen". *Water Resources Development*. Vol.19 No.2. June: 139-152.
- Schuller, Tom, Stephen Baron, and John Field (2000). "Social Capital: A Review and Critique". *Social Capital: Critical Perspectives*. Edited by Stephen Baron, John Field, and Tom Schuller. Oxford: Oxford University Press: 1-38.
- Segerfeldt, Fredrik (2005). *Water for Sale: How Business and the Market Can Resolve the World's Water Crisis*. Washington, D.C.: Cato Institute.

- Serageldin, Ismail (1995a). "Toward Sustainable Management of Water Resources." *Directions in Development*. Washington: D.C. World Bank.
- (1995b). "Water Resources Management: A New Policy for a Sustainable Future." *Water Resources Development*. Vol. 11. No. 3.
- Shiva, Vandana (2002). *Water Wars: Privatization, Pollution and Profit*. Toronto: Between the Lines.
- (2005). *Earth Democracy: Justice, Sustainability and Peace*. Boston: South End Press.
- Shone, Steve J. (2000). "Kropotkin's Just Community: A counterexample to the Theory that Liberal Democracy has Triumphed." *Contemporary Justice Review*. Vol.3(2): 187-204.
- Singer, Peter (1999). *A Darwinian Left: Politics, Evolution and Cooperation*. New Haven: Yale University Press.
- (2004). *One World: the ethics of globalization*. 2nd Edition. New Haven: Yale University Press.
- Sjölander Holland, Ann-Christin. (2005). *The Water Business: Corporations Versus People*. Halifax, Nova Scotia: Fernwood Publishing Ltd.
- Skidmore, Thomas E. and Peter H. Smith ([1984] 2001). *Modern Latin America*. 5th edition. Oxford: Oxford University Press.
- Smith, Cameron M. and Charles Sullivan (2007). *The Top 10 Myths About Evolution*. New York: Prometheus Books.
- Stiglitz, Joseph E. (2003). *Globalization and its Discontents*. New York: W.W. Norton & Company.
- Tati, Gabriel (2005). "Public-private partnership (PPP) and water-supply provision in urban Africa: the experience of Congo-Brazzaville". *Development in Practice*. Volume 15, Numbers 3 & 4. June: 316-324.
- Todes, Daniel P. (1987). "Darwin's Malthusian Metaphor and Russian Evolutionary Thought, 1859-1917." *ISIS*. 78: 537-551.
- (1989). *Darwin Without Malthus: The Struggle for Existence in Russian Evolutionary Thought*. New York: Oxford University Press.
- Tortajada, Cecilia (1998). "Contribution of Women to the Planning and Management of Water Resources in Latin America." *Water Resources Development*. Vol.14, No.4: 451-459.
- UNDP (2001a). United Nations Development Program. *Human Development Report 1991*.
- UNDP/PNUD (2001b). *Informe sobre Desarrollo Humano: El Salvador 2001*.
----- 2003.
----- 2004.
- UNDP (2006a). *Human Development Report 2006: Beyond scarcity: Power, poverty and the global water crisis*.
- UNDP/PNUD (2006b). *Informe sobre Desarrollo Humano: El Salvador 2006*.
- UNES (Unidad Ecológica Salvadoreña) (2005). *Hacia la Gestión Sustentable del Agua en El Salvador*. Segunda Edición.
- UN-Habitat (2003). United Nations Human Settlements Program. *Water and Sanitation in the World's Cities: Local Action for Global Goals*. London: Earthscan.
- United Nations Cyberschoolbus (2008).
< <http://cyberschoolbus.un.org/infonation/index.asp>>

- Waal, Frans de (2005). *Our Inner Ape: A Leading Primatologist Explains Why We Are Who We Are*. New York: Riverhead Books.
- Wade, Robert (1988). *Village Republics: Economic Conditions for Collective Action in South India*. San Francisco: ICS Press.
- Wilson, David Sloan and Edward O. Wilson (2007). "Rethinking the Theoretical Foundations of Sociobiology". *The Quarterly Review of Biology*. Vol.82 No.4. December: 327-48.
- World Bank (2002). "Water—the essence of life". Washington, D.C. May 17. Downloaded November 10, 2004:
<<http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/o,,contentMDK:20044610~menuPK:34457~pagePK:34470~piPK:34424~theSitePK:4607,00.html>>
- World Bank (2003). *World Development Report 2004*. "Making Services Work for Poor People". Oxford: A Co publication of the World Bank and Oxford University Press.
- World Health Organization (2005). "Ecosystems and Human Well-Being". A Report of the Millennium Ecosystems Assessment. Downloaded 21 December 2007:
<<http://www.who.int/globalchange/ecosystems/ecosys.pdf>>
- (2006). *Mortality Country Fact Sheet 2006: El Salvador*. Downloaded 27 April 2008:
< http://www.who.int/whosis/mort/profiles/mort_amro_slv_elsalvador.pdf>
- Woodcock, George and Ivan Avakumović (1990). *From Prince to Rebel*. Montreal: Black Rose Press.
- Zwarteveen, Margreet Z. (1997). "Water: From Basic Need to Commodity: A Discussion on Gender and Water Rights in the Context of Irrigation". *World Development*. Vol.25, No.8: 1335-1349.

INTERVIEWS

- Aguilar Molina, Carlos, MARN (interview, 23 January, 2006)
- Avila, Gloria de, RA-SES (interview, 5 April 2006)
- Claros, Jonathan, CARE El Salvador (interview, 4 April 2006).
- Dreikorn, Carolina, UNDP El Salvador (interview, 22 March 2006)
- Estrada, Nelson, CIDA El Salvador (interview, 4 April 2006)
- Gomez, CDC (interview, 3 March 2006)
- Ibarra, Angel, UNES (interview, 1 March 2006)
- Larios, Silvia de, PRISMA (interview, 20 January 2006)
- Menjivar, Julio, ANDAR (interview, 29 March 2006)
- Navarro, Ricardo, CESTA (interview, 3 April, 2006)
- Quezada, Marta Lilia, SalvaNatura (interview, 8 March, 2006)
- Rivas, Miguel, ADESCO-Delicias (interview, 6 February 2006)
- Sandoval, Magno, Romero Pineda & Asociados Compañía de Abogados Legal Services (interview, 4 April 2006)
- Umaña, Jose, CARE El Salvador (interview, 4 April 2006).

FOCUS GROUPS (FG)

FG 1, Animas (20 January 2006)
FG 3, Delicias (9 February 2006)
FG 4, Animas (27 February 2006)
FG 5, Delicias (25 February 2006).
FG 6, Animas (6 March 2006)
FG 7, Animas (10 March 2006)
FG 8, Delicias (10 March 2006)
FG 9, Delicias (31 March 2006)



**Saint Mary's
University**

Halifax, Nova Scotia
Canada B3H 3C3

Patrick Power Library

tel 902.420.5534

fax 902.420.5561

web www.smu.ca

Research Ethics Board Certificate Notice

The Saint Mary's University Research Ethics Board has issued an REB certificate related to this thesis. The certificate number is 05-102.

A copy of the certificate is on file at:

Saint Mary's University, Archives
Patrick Power Library
Halifax, NS
B3H 3C3

Email: archives@smu.ca

Phone: 902-420-5508

Fax: 902-420-5561

For more information on the issuing of REB certificates, you can contact the Research Ethics Board at 902-420-5728 / ethics@smu.ca