

Redefining Water Quality Issues in Rural Haiti: An Interdisciplinary Approach

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Redefining Water Quality Issues in Rural Haiti, an Interdisciplinary Approach

Preface

For over twenty-one years now I have been an interactive explorer of the dynamic world around me. It has been a struggling, uphill battle of learning of ways to organize, classify and understand the complexities of my world. For as long as I can remember, I have been intrigued by life and how I live as a woman, American, human, animal, and as a member of the greater community of the planet. I am finally reaching a stage in my life where I am beginning to have to choose. In a matter of months, I will have to make sense of what is important to me to do, to think, and to feel. Then, I am expected to decide upon paths, paths that will lead to my future career, loves and dreams. So I find myself trying to define my passions and my self. In this last year of college, I have given considerable thought and effort to this project. Over a year ago now, an art exhibit sparked interest in me, since then I have researched, traveled to another country and have experienced, observed and participated in events that have changed who I am and my perceptions of the world in which I live.

This project has evolved in so many ways for me. I cannot begin to explain how my perspective of learning, the world, and most importantly, myself, have transformed. I remember about a year ago, when I was studying abroad in Paris, a luxury away from home, I was worried about what I could possibly write for my thesis-this year long, intensive research project. I felt so much pressure to choose something that would allow me to shine, a project that would show what I have learned in these twenty-two years, and one that I would feel passionately about. I also wanted to find a way to apply what I have learned and to legitimize, in a way, the interdisciplinary learning path I have chosen for myself.

For me, the completion of this paper is not the end of my learning process. This is what I believe. This is what I want to do. Hopefully, in the years that follow I will be able to look back at this 'thesis' project and will see how things have progressed. I would like to think that, years from now, I will still be working hard to reach outside of what I have been taught and to learn from others. I also hope to return to Haiti, maybe this time for a longer period of time. I didn't believe it before I went, but they were right. There *is* something magical about Haiti.

I would like to thank to Professors Damon, Diehl and Shugart of the University of Virginia for helping me throughout my studies and for advising me on this project. Thanks to Sébastien for being so kind and passionate, Father Joseph for giving me the opportunity to travel to Fondwa, and all those in the communities of Cayes-Jacmel and Fondwa who not only took me in, but also taught me how to see. Additionally, I would like to thank 'my girls'. You know who you are, my lifeline and my kindred spirits. Most importantly, I couldn't have possibly completed this project without the support and unconditional love of my Mom and Matt. I cherish you both.

Chapter 1. Introduction: The Multifaceted Issues of Water Quality in Rural Haiti

In the process of reshaping nature, society reshapes itself-- Karl Marx.

Before starting my research, I knew that water quality was poor in Haiti. This was evident in the statistical data compiled by sources such as the World Development Indicators (WDI) of the World Bank and the Natural Resource Institute (NRI). Therefore, the purpose of my research focuses less on determining whether there *are* water quality issues in Haiti and focuses more on the *redefinition* of issues of water quality in the Haitian landscape through an interdisciplinary approach. Subsequently, I hope to substantiate my philosophies concerning environmental restoration by pursuing some of the numerous potential perspectives of water quality issues in rural Haiti and while emphasizing the often-overlooked role of the rural Haitian in the Haitian landscape. In this paper, I explore some of the ways Haitians might see their landscape, today and throughout history through the use of biological and anthropological methods of quantitative and qualitative analysis and observation. In the following chapters, I investigate the movement of natural resources across social and historical boundaries, I emphasized the importance of understanding the many-leveled dependency of man and her environment,¹ and I explore hypothesis of how Haitian spirituality and symbolism may translate into everyday man/land interactions.

The portrait of the deserted, desolate and hopeless Haitian Landscape lacks depth and interdisciplinary perspective. Biological analyses of water quality in Haiti often rely solely upon

¹ Coupled with the environmental complexities of erosion, there are “transboundary” erosion issues, which increase as traditional Haitian systems of land-tenure decrease the hectare per person ratio of land ownership throughout the landscape. The subdivisions between landholder’s properties are multiplying rapidly with the increasing population density patterns throughout

qualitative, ‘scientific’ data collection such as analysis kits, microbial counts and pH values. Likewise, many anthropological studies of rural Haitian ‘peasantry’ deconstruct ‘culture’ as if it is exclusive of and separate from the natural environment. In this paper, I argue that it is imperative to approach multifaceted, dynamic systems such as those encompassing water quality from many different points of view. The following excerpt from Alan Kolata’s analysis of the exploration of raised-field agriculture in the ancient Altiplano of North-Western Bolivia presents a similar ecological picture to that of Haiti and also emphasizes the advantages of the multifaceted perspectives when dealing with issues of environmental restoration:

But, even more, because of these experiments, we now also understand the underlying historical causes of the stark contrast between ancient abundance and modern impoverishment in the high plateaus around Tiahuanaco. With the disappearance of raised-field technology prior to the Spanish colonization of the Andean world, and the subsequent biological and cultural disaster of Indian contact with Europeans, the high plateau spiraled into unremitting decline. Today, it is a marginal environment—even though, in ecological terms, it is not inherently so. From rich, surplus producing agricultural estates one thousand years ago, the Altiplano has been reduced to a forbidding, frost- and drought-plagued landscape barely able to support subsistence farming at the most rudimentary levels. It is not terribly surprising that large-scale agricultural development (and agricultural developers) supported by international agencies have bypassed this once-rich environment for the more seductive tropical lands of the Amazonian floodplains. There, deforestation continues apace to support mega-development schemes employing familiar agricultural technology adopted from the Western world...If they talked to Cosme, mattock in hand, pulling potatoes from his fields, they might have understood that technical skill and ecological sophistication are not the monopoly of the modern world. (Kolata: 258).

In this paper I dispute generalities concerning local and indigenous knowledge and acknowledge the wealth of information and resources *currently* available within the Haitian landscape. I hope to use the many factors contributing to the health of Haiti’s water sources to approach these issues in an interdisciplinary synthesis and *redefinition* of local problems of water quality.

The purpose of this Chapter is to present both the format of this paper and my reasons for choosing issues of water quality in rural Haiti as the focus of my research. In the following Section,

'*Why Haiti?*' I emphasize personal, political, ecological and social reasons for entering into this long-term and, hopefully, long-lasting project. This includes some of my own feelings as to the relationship between Haiti and the U.S. and my own experiences while conducting fieldwork in Cayes-Jacmel and Fondwa, two regions in the southern provinces of Haiti. Likewise, in the second section of this Chapter, '*Why Water Quality?*' I outline the reasons behind my interest in water quality issues. In the final Section of this Chapter, *Organization and Purpose*, I outline each of the chapters of the paper and present some of the biases and assumptions I had before starting my research. In the following Section, I outline my philosophies concerning human/nature interactions and further emphasize my reasons behind taking an interdisciplinary approach to issues of water quality in Haiti.

Shifting Perceptions of Human/Nature Interactions

As we have constructed a world in which we are continuously buffered from man-land interactions, we have become increasingly less aware of the many processes encircling us. Instead, our vast landscapes have become dulled, depersonalized museum pieces to be carted, shipped and stored for later use. For us, in the 'Western World', the strength, spirituality and essences of nature has been replaced by the Discovery Channel, National Geographic and the National Zoo. Many in the industrialized world, including myself, yearn for more intimate links with natural forces. We long to escape from our concrete jungles to the 'wilderness'—to understand where our food is coming from, who grows it and how. Although the appreciation for nature still exists within 'the West', I find that we find ourselves more often than naught detached, exempt and apathetic to the natural powers surrounding us. Nature has become an abstract entity—one that we don't see as influential in our everyday lives. Instead, we turn to industry, science and technology to give us the 'facts' that the 'chaos' of nature cannot provide. However, at the same time we are increasingly coming face-to-face

with reminders of our intrinsic dependency on the natural world. Things like natural disasters, global warming, and toxic waters remind us that human life is not sustainable without nature.

Predominant Western Ideology tells us to construct systems of understanding through sorting, classification, and modeling so that we may create order from the ‘chaos’ of nature. Whether it be social, cultural or scientific, Western Ideology focuses the capture of knowledge in the *separation* of ideas, hoping to lead to eventual *synthesis*. I would like to propose that understanding is better reached through the *synthesis* of multidisciplinary ideas and a sense of environmental reciprocity. This, I argue, is frequently represented in natural symbolism and religious mysticism within a culture.²

Within our society agriculture and industry are meant to reshape nature in ways that best suit the demands of society. In this manner, we are forming linear relationships with the natural environment rather than reciprocal or cyclical exchanges. By creating systems of understanding that are contrary to preexisting systems, ‘nature’ and ‘culture’ are made into adversaries. Instead of working within the systems of the ‘natural world’ we distinguish between what Marx refers to as ‘external nature’—natural ecosystems—and ‘humanized nature’. As we see it, ‘external nature’ is lacking of structure and doomed to mass chaos. Humanized nature, however, is that which is shaped by human intention and leads to the systematic understanding of parallel systems (Lansing, 11). Accordingly, Marxist views of ‘humanized nature’ ultimately confront the earth as an alien, hostile world standing over and against mankind.³

Resources are drawn from the earth, are used by society and are transformed into waste. In these ways many of us living in industrialized countries continue to exasperate our separation from natural landscapes: We build houses with no natural air or light; we drive in cars instead of walking down the block; we buy foods from the supermarket, laden with toxic chemicals; we teach our

² Much of this paragraph is excerpted from a previous analysis of mine concerning the role of Balinese water temples in hydrological management.

children to define themselves with what they own, not by what they believe in or by the experiences they have had; and we confine nature to static compounds where one must pay to enter, to breathe and to see green. Fortunately, there are many people and cultures in the world that continue to maintain strong and intimate ties to the land. For example, in Balinese culture there is a greater understanding of the cyclical interactions of humans and their environment. Ritual, spirits, farming productivity and hydrology cooperate to contribute to the local Balinese farmer's greater understanding of her place in the Balinese landscape. In this way, Balinese irrigation water temples emulate natural models of water flow and integrate culture, nature and religion into one.

People are constantly giving to, taking from, producing, and reproducing in their local environment, thus affecting the entire earth. With both hands and minds we are forming the natural world around us and, likewise, the natural world has and is forming us. Within our different cultures and places we play varying roles in these transformations. Furthermore, we each carry with us different perceptions of how the natural world works and what it encompasses. In this way, our perception of the environment has the power to shape, influence and distort the image of local peoples and of an entire culture. Within this paper, I show how the nature/culture dichotomy is neither applicable nor accurate in describing the earth's systems. Additionally, I emphasize both the importance of understanding *local* knowledge as fundamental to greater understanding of our environment and the value of approaching environmental issues through an interdisciplinary, multi-perspective approach. In the following chapters, I use this approach to present and analyze the multifaceted issues of water quality and availability in rural Haiti. I emphasize the importance of not overlooking the wealth of knowledge contained within the rituals, beliefs and actions of local Haitian farmers who have worked the land for generations. In anthropologist Alan Kolata's book, *Valley of*

³ I will return to this concept of 'humanized nature' later in this Chapter.

the Spirits, which talks about the Aymara Indians of the high plains of Bolivia, he points out the great resources of local, indigenous knowledge to greater environmental knowledge:

Underneath the surface of the indigenous world, and not always completely hidden or too deep, we can still tap enormous reservoirs of knowledge, fonts of priceless environmental wisdom, if we only approach that world with a genuine sense of openness and humility. If we could grasp time and reality as some of the Aymara do—if, for us, the reality of past and present was a seamless whole—we might be able to more fully appreciate the intimate connectedness of humans and their environment. We might see more clearly the long-term consequences of our actions on the fragile vessel we all inhabit. We might even discover new, unexpected paths to a sustainable future. (Kolata: 259).

It is through the greater understanding of the inherent, inseparable relationship of cultural and environmental interactions that one may begin to reconstruct the broken landscapes years of resource extraction have created. I believe it is the codependency of humans and their environment that make this research so interesting. Through better understanding a local people's perception and developed relations with their immediate surroundings, it is possible to merge preexisting social, religious and hierarchical structures with conceptual approaches to environmental restoration.

Why Haiti?

It is precisely the special culture of Haiti, the first Black republic, the daughter of Africa, the stepchild of France, the ward of the Marine Corps, the hermit of the Western Hemisphere, that differentiated Haiti from any other Third World country and makes it essential for both the researcher and the practitioner to understand its history and culture. (Charles R. Foster: page unknown).

Many people have asked me “Why Haiti?” and “Why water quality in Haiti?” I don't have any ties to Haiti. I'm not Haitian. I didn't know any Haitians before I started this project. Furthermore, I didn't really know anything about Haiti. On the other hand, I was well aware of the U.S. news concerning Haiti—articles about extreme poverty, political unrest, drug trafficking, ‘boat people’, and unwanted immigrants. As an American, I soon realized that even though I didn't think I had ties to

Haiti my country maintained high levels of influence over this tiny island off of the Florida coast in the midst of the Caribbean. In addition to this, acknowledging the existence of such abject poverty ‘right next door’ was quite an eye-opener for me. For these reasons alone, I was drawn into trying to understand more about Haitian history, culture, and the environment—I decided to escape from the role of ‘apathetic observer’. Something told me that there was a lot to be gained from learning more about Haiti, her cultures and her landscape. I soon found out that there was a lot to learn about those things and, in turn, a lot to learn about my own culture, government and landscape. By this I mean that the exploration into aspects of Haitian culture, structure and issues have taught me about the need for constant *reevaluation* of issues of my country’s involvement in nearby countries and the need for specific, local solutions to all facets of social, economic, and environmental problems.

I want to suggest that, in order to recognize heterogeneities within themselves, it is time for Western societies to start listening to the voices they have so successfully repressed over the centuries.... Originally created by Western greed, Caribbean societies have developed by establishing multifarious relations of mimesis, resistance, syncretism and rupture with native, African, American, Asian, and European cultures (Malena, 5).

Officially, my research on Haiti began when I went to an art exhibit in Paris called ‘Ange et Demons’. It was at the Indigenous Art Museum and was advertised as an exploration of arts of Haitian Voodoo. I was intrigued and decided to go. Amidst sculptures, Voodoo flags and brilliantly colored paintings, I was astounded by the technique, color and depth of these Haitian pieces of creativity. I was drawn to tears by capture of power and life of these spiritual works of art. As I wondered around the gallery with Simbi to my left, La Sirène to my right, and Damballah in my midst,⁴ I felt an overwhelming sense of awe. I wanted to know how a country with such suffering could create such beautiful art. I wanted to find out more—I was searching for a new perspective.

⁴ These are all Gods of Haitian Voodoo.

It was an exhibit filled with intense spirituality that drew me initially to Haiti and her battered landscape, however my curiosities and experiences with Haiti extended far beyond the gallery walls. Although I was fascinated by the spiritual elements of Haitian culture, I had a background in biology, environmental sciences and anthropology. I decided to use my scientific ‘knowledge’⁵ and to integrate it into a culturally aware, interdisciplinary project. I wanted to gain a greater understanding of how different cultures interact with, approach, and perceive their natural environment. In Haiti, I decided to explore issues of water quality—with water being a resource that not only sustains my life, but sustains a lot of my spirit too.

Why Water Quality?

Water issues are most eminent of all environmental issues. No living thing can survive without water. Water quality is directly affected by other environmental sources of degradation (deforestation, industry, atmospheric pollution....), not to mention the equally important—yet often overlooked—variables that are deemed ‘cultural’ or ‘social’ (population, allocation of labor, religion...).

Freshwater is quickly becoming our world's most limited resource. Without water, there cannot be food; without water, there cannot be people. When thinking about watershed management, as well as other environmental policies, it is important to ask many questions of the local population and to understand that the perspective of the local population is both key and, more importantly, *primary* to the success of any type of developmental program. In this paper, I outline not only the imminent scientific data associated with water and land quality issues in the Fondwa and Cayes-Jacmel areas of Haiti, but also attempt to create a foundation for a changing perspective of the Haitian environment,

⁵ I use knowledge here questionably. I feel that, although we are used to looking at scientific ‘knowledge’ as fact and as a validator for other systems, that these scientific disciplines are merely basins for extended hypothesize and experimentation.

her people, and the complex interactions between the two codependents. I will explore the specifics and importance of water quality and availability in Chapter 2. *'The Earth's Most Precious Resource': Freshwater Availability and the Problem of Quality'*. In the following Section, I present some of the generalities of the research I did in Haiti and outline the organization of the Chapters that follow.

Organization and Purpose

I traveled to Haiti in January to work with both the Center for Development and Human Resources (CDRH) and the Peasant Association of Fondwa (APF). My plans were to take the data from trends found in this project and compare it with historical and cultural events I observed in the field. In Haiti, I conducted a two-part project combining ecological and anthropological research. I took soil and water samples in two Southern regions of Haiti, Cayes-Jacmel and Fondwa. My fieldwork's parameters were partially determined by my short stay in Haiti (13 days), accommodations available to me, and the hope for some sort of comparison data. Some of the topics I determined to explore on my trip were: A) Whether local Haitians are conscious or concerned with freshwater availability and quality, B) What are some local, grassroots ways for environmental change, C) Who are the community 'leaders' (my understanding was that voodoo leaders and 'groupmen' leaders in rural areas have a lot of ability to catalyze community-level action) and to D) Get a more personalized feel for Haiti and her people. While I was in the field, I talked to Haitians in rural and urban areas, discussed projects in the area, participated in organizational group meetings, and led an informational session concerning issues of water quality.

In the following chapters, I use statistical data compiled from the World Resource Institute and the World Bank, which can be applied to understanding some of the social and ecological connections being made and inherent of the Haitian landscape. I will present analytical data from these reports and

apply this data to some of my own hypothesis of the causal connections existing between Haitians and their environment.

As I mentioned in the previous Section, Western systemization associated with sorting, classification, and modeling focuses on singular-perspective approaches to natural systems. These methods are also widening the gaps between comprehensions of ‘the whole picture’, in that we are separating agents that are not only interrelated, but are often codependent. In order to breach these gaps, it is crucial to understand the ideologies and concepts behind the formation of and response to complex natural systems. There are no real borders between ‘natural’ and ‘human’ systems in today’s world. On earth, there remain no ecosystems, minute or grand, which do not feel the impact of human civilization.

I have organized this paper according to the order in which I learned about issues concerning water quality in Haiti. As follows, this Chapter, ‘*The Multifaceted Issues of Water Quality in Rural Haiti*’, is an overview of some of my philosophies concerning the study of environmental issues and also outlines my reasons for deciding to commit to at least a year-long project devoted to learning more about issues pertaining to water quality in Haiti. In Chapter 2, ‘*The Earth’s Most Precious Resources: Freshwater Availability and the Problem of Quality*’, I proceed to topics pertaining to my background knowledge of the Hydrological Cycle and to some of the global statistics that indicate the importance of freshwater sources. In this Chapter, I also touch on labor issues associated with the collection of water and describe the soil and water test kits I used in the field. Furthermore, I highlight some of the general responses I received from local communities concerning my fieldwork in Haiti. I speak in depth about my experiences in Cayes-Jacmel and Fondwa in Chapters 5 and 6. Chapter 3, ‘*The State of Haitian Water Sources*’, proceeds to explain water quality and availability statistics specific to Haiti. In this Chapter, I use data from the World Resources Institute and the World

Development Indicators of the World Bank to create a causal flow diagram of the connections between variables such as land-use, population, labor, pollution sources, water availability and the main focus of this project, the quality of freshwater sources in Haiti. I use this diagram to emphasize the complexity of issues of water quality and to outline the many interactions taking place within the system. At the end of this Chapter, I discuss some of the major sources of pollution for the Haitian water supply and also touch on issues of power, which are associated with the control of natural resources. In Chapter 4, '*Great Flows and Cycles: Land, Water and Culture, The Inseparable Trilogy*', I attempt to both deconstruct and synthesize the various flows and cycles that are contributing to problems of water quality. In this Chapter, I emphasize the interconnectedness of issues of agriculture, capital, land-use, and hydrological movements and speak specifically to some of the questions I have concerning the affects of agricultural practices of the Haitian farmer on local water quality. Chapters 5 and 6 examine the results of my fieldwork and describe many of the opportunities and interactions I had during my time in Haiti. In Chapter 5, '*Fieldwork and Results in Cayes-Jacmel, A Southern Coastal Town of Haiti*', I focus on my fieldwork and results concerning water quality in the region. I outline some of the questions I had before arriving in Cayes-Jacmel and describe in detail the Disaster Prevention Workshop I participated in there. Chapter 6, '*Fieldwork and Results in Fondwa, A Mountain Village*', focuses on issues of land-use, agriculture and soil nutrient availability in Fondwa, a southern mountain village of Haiti. The research I did in the field was an attempt at applying the aforementioned ideologies concerning conceptual flows and an interdisciplinary approach to ecological health issues. However, at the same time, my main goal in traveling to Haiti was to be a sharer of information and experiences and, more importantly, to be a listener and observer. Therefore, although I did have some ideas of what my role would be in the towns I visited, there were many things that came as a surprise, including my own reaction to

situations. In Chapter 7, *'Natural Symbols, Water and Trees in Haitian Voodoo and Metaphor'*, I complete my analysis of fieldwork by taking a less scientific and more anthropological approach to environmental trends in the regions I visited. In this Chapter, I make some hypotheses and provide some examples of the potential role of Voodoo and metaphors in explaining some of the relationships between rural Haitians and their environments. Finally, Chapter 8 *'Conclusion: Through the Local Eye'*, concludes with reflections and some suggestions concerning the current situation in Haiti, the importance of acknowledging 'local knowledge', and the fundamental need for increased communication and quality education across all borders—national, political, gender, and age. By organizing the paper in this way, I intend mimic the development of my own understanding of the many facets of water quality issues in Haiti. The Appendices I have provided are to serve as a reference and also represent some issues that, although I am not able to expand upon them in the main body of my paper, I find are both important and relevant the goals of this project. Included in these Appendices are excerpts from the personal diary that I kept during my fieldwork in Haiti. As you read the diary, I suggest that you reflect back on the paper and note how the progression of emotional experiences from the journal are both influenced by and influence the 'rational' experiences I had during this project.

Chapter 2. 'The Earth's Most Precious Resource': Freshwater Availability and

The Problem of Quality

In an age when man has forgotten his origins and is blind even to his most essential needs for survival, water along with other resources has become the victim of his indifference. (Rachel Carlsen, Silent Spring).

Water is not only considered a 'natural resource', but it is also a critical necessity for all life on this planet. We use it for bathing, washing, drinking, playing, swimming, and cooking--in almost all aspects of life. Personally, I have always felt a particular attachment to water, to the power of the unforgiving tides of the ocean's shore, to the shimmering on the surface of a mountain lake, to the refreshing glass of coldness on a hot summer's day--I could go on forever. Hasn't everyone marveled at the dewdrops hanging from the spring grass? Water is surrounding us and comprises us, but it is something that most people take for granted as always being there.

I have divided this Chapter into five main Sections: Time, Labor and Water Collection in 'Developing' Countries, Water Availability and the Hydrological Cycle, Why Water: Issues of Quantity, Why Water: Issues of Quality and Data Collection Tools, and Local Responses. In Local Responses I begin to expand more upon some of these issues of water availability, quality and accessibility within cultural constraints. (i.e. who is able to control the water sources and who is dealing the most with these sources?). The majority of this Chapter is not specific to Haiti, but instead is an overall picture of these issues on a more global scale. I have done this to provide a proper background for my own personal motivations for exploring water quality issues in Haiti and local perceptions/perspectives of the local environment. In this sense, I am hoping that this Chapter allows the reader to obtain a broad understanding of some of the ecological issues at hand and related vocabulary. Additionally, I have included the information from a presentation that I made as a part of a Seminar on Disaster Prevention to a group of approximately twenty local leaders in the Southern,

coastal town of Cayes-Jacmel, Haiti. This presentation included information about the results I found in regard to the contamination of their local water sources⁶, health-issues correlated with freshwater contamination, and some potential preventative methods concerning the restoration of local water sources and illness prevention. I have presented the ‘factual data’ of this presentation in the following sections and talk further about specific reactions as well as my own personal responses to fieldwork in Cayes-Jacmel in the Chapter 5.

Time, Labor and Water Collection in ‘Developing’ Countries

According to the United Nation’s Report, *Water: Asia’s Environmental Imperative*, only thirty-two percent of the population of ‘developing’ countries lacks easy access to safe drinking water:

In many parts of Asia, water-stressed peoples are forced to live, not only without the minimum supply of water for daily necessities, but also with no guarantee that the meager trickle they get is always safe to drink. Spiraling population and economic growth puts increasing pressure on limited water supplies. Groundwater is threatened by increasing use-because of the growing demand on food stocks by more people-of agrochemicals and inappropriate soil and water management. (Water: 44).

Issues of water quality and availability span across national, gender, political, and economic boundaries as well. Scarcity, breeds areas for opportunism, where companies are able to privatize water as a commodity and extract it from the ‘natural’ system of the ecology. I will talk about this further in Chapter Four, as I discuss the flows of materials, resources, and commodities within the Haitian landscape. In addition to the stress on total human health, in many countries water scarcity becomes an engendered problem. For example, in the rural areas of Haiti women and young children almost exclusively handle water transport. In Cayes-Jacmel and Fondwa I saw three and four-year old children carrying buckets of water on their heads, which decisively outweighed them.

⁶ This is included in Chapter 5, the overview of my field research and results in the Cayes-Jacmel region.

Figure 2.1 Women and Children Washing Clothes near the Main Water Source at Bèl Fontèn



Correspondingly, in areas where there is limited water supply, it is the women and young children who are directly tied with the chores of water usage--drinking, cooking, and cleaning--who travel increasingly long distances to water sources with no other option (See Figure 2.1). Women and children will walk as much as five hours a day to collect water, which weighs in the range of 25 kilograms, using up to one-third of their daily energy intake. (Water: 45).

Since women are the water providers, disappearing water sources have meant new burdens and new drudgery for them--each river and spring and well drying up means longer walks for women for collecting water and implies more work and less survival options...(Staying Alive, Vandana Shiva, 1988).

According to an assessment of ASSET (Agriculture Sustainable System and Environmental Transformation) of the upper watershed of the Rivers Grise and Blanche, which are providers to the Nation's capital of Port au Prince, local Haitians are spending a considerable amount of time and labor in the collection of water. It is estimated that approximately 180 person-days per household, per year is spent on procuring water for domestic uses only. According to their report:

This [amount of time] represents a significant potential resource that might otherwise be applied to: (1) value-added transformation of agricultural produce; (2) intensification of production on selected plots; or (3) establishment of erosion control structures (vegetative or physical) on fragile lands. (Assets: 17).

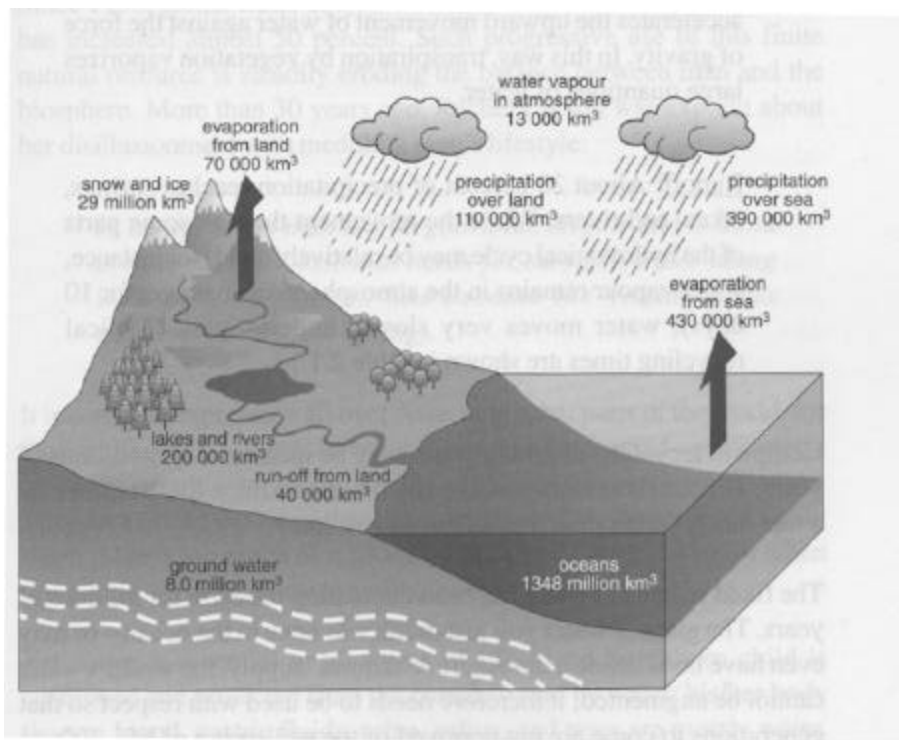
Particularly in poorer areas, even places where water quantity is not as much of an issue, clean water sources are difficult to come by. In my fieldwork, it was very apparent that water issues were among the top concerns of the local people of the region of Cayes-Jacmel. In a rural area such as this although there is no reported use of agrochemicals and there is even a PVC system installed, including many covered water sources, the contamination of water is inevitable. This is because of lack of sanitation systems; free animal husbandry where livestock wander freely in and around water sources, and the presence of all types of organic materials and microbes inherently present in untreated water sources. Unfortunately, most don't realize that even if water looks clean, most water sources contain potentially harmful microorganisms. For many 'clear water' is not viewed as a living ecosystem because the human eye cannot see the objects living in the water and is, therefore, deemed okay to drink. Despite my knowledge of water-borne disease and pathogens, I too decided it was okay to have a glass of water on a very warm day from the local tap in Cayes-Jacmel. I found out very quickly that the cool, fresh tasting water was not pure enough for my system!

Water Availability and the Hydrological Cycle

Despite the fact that there are approximately 1,400 million cubic kilometers of water on the earth, the amount of freshwater is only 2.6 percent of the earth's total water volume. Of this small percentage of freshwater, only 0.8 percent is considered available for drinking and irrigation purposes. Remaining freshwater is either located in extremely deep, inaccessible groundwater deposits, or is 'trapped' in the frozen masses of glaciers and icecaps. (Water: 36). Therefore, the intricacies of the

hydrological cycle—or system of water movement—is key to understanding the most effective and efficient methods of exploiting freshwater resources, while being sure to enable the continuance of the cycle’s restoration of land-based freshwater reserves.

Figure 2.2 The Hydrological Cycle



(Water, Asia’s Environmental Imperative pg. 37)

As is outlined in Figure 2.2, the Hydrological Cycle is a recurring system, which renews water sources through the processes of evaporation and precipitation. Within the system there are various forms of ‘bodies of water’ including lakes, reservoirs, aqueducts and watersheds. In this paper, I will refer to the watershed of a local area, which is an area drained by a single watercourse system. The functional upstream unit of the watershed and land-use attributes directly and proportionally affect the downstream areas at differing levels. (Jacob: 20).

Due to one of the major precepts of physics, “Matter is neither created nor destroyed”, the amount of water on the surface of the earth remains constant. However, there are complex transformations that occur during the Hydrological Cycle, leaving large volumes of the earth’s freshwater inaccessible for varying periods of time (see Table 2.1). This is an important aspect of the hydrological cycle to think about when contemplating the use of freshwater. For humans, whose body’s water content is equivalent to approximately 60 percent of body weight, and whose blood is 90% water, the availability of freshwater is crucial to sustaining life.

For that reason, the current issue is not that there isn’t enough freshwater on the earth, per se,⁷ it is that the balance between human use and hydrological renewal is worsening, so that there is a dramatically decreasing amount of *available* freshwater on the planet,⁸ coupled with the problem of the inherent unevenness in the distribution of natural resources and inconsistent availability. (Water: 40).

Table 2.1 Average water renewal cycles

Permanent snow	9700 years
Oceans	2500 years
Groundwater	1400 years
Lakes	17 years
Swamp Water	5 years
Soil Moisture	1 year
Streams	16 days
Atmospheric Moisture	8 days

(World Resources 1994-5)

⁷ Although this may become more of an issue as the global water use trends continue to climb at drastic rates.

According to a 1986 survey of the World Resource Institute, out of 100 countries selected, 51 countries had either low (1000-5000 m³/year per person) or very low (1000 m³/year or less per person) water availability. These results are alarming to many countries, particularly those who inherently have less available water within their boundaries. In this sense, freshwater can be seen as a key source of both political and economic power. As I will discuss in Chapter 3, who controls freshwater plays a major role in how people use this precious resource in whoever has *enough* water⁹, and in how much, if at all, freshwater costs. Specifically, I discuss different aspects of water control, drinking water in particular, and how the role of water in much of Haitian history and today is a primary example of the increasing pressure on nations and on individuals to extract and maintain healthy water sources.

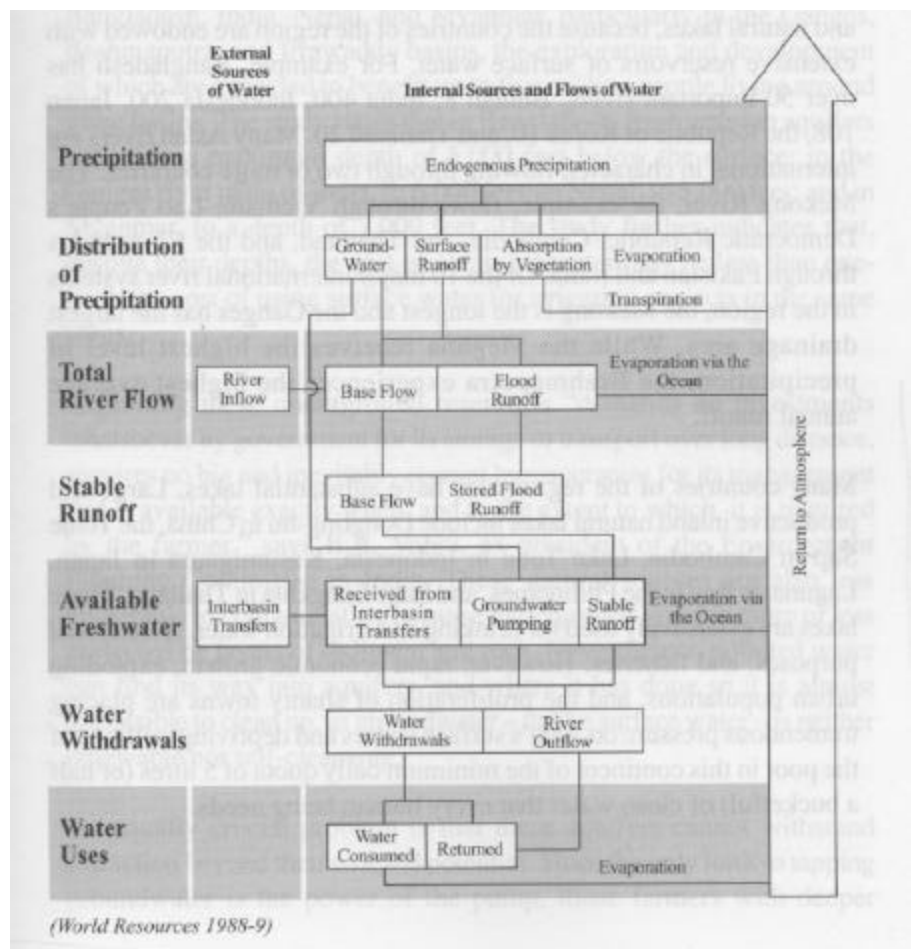
Why water: Issues of Quantity

A substantial amount of water is drawn from *surface* water reservoirs such as lakes and rivers. However, as the population grows, there is an increasing need for the exploitation of *groundwater* sources. These underground reservoirs are contained in the sediment rocks below the earth's surface and are aquifers, which range greatly in size and depth. Some advantages to groundwater use is that these sources are less likely to fluctuate with seasons and are more protected from sources of contamination due to their location.

⁸ In other words, the amount of time it takes for diminishing water sources to renew themselves far outreaches the rate at which we are consuming freshwater resources.

⁹ What is enough water? According to Dr. William Forgey, author of *Wilderness Medicine*, a person can expect to survive five to seven days in temperatures of 90°F and eight to ten days in 60°F. Many experts recommend that you consume between three to four quarts of water a day, or approximately 0.5 ounces of water per pound of your body weight.

Figure 2.3 Freshwater Resources for a Country



Unfortunately, as is true with many ‘developing’ countries, there is not enough financial support or technical equipment in Haiti to access deepwater sources. It is much cheaper and easier to utilize surface water. However, due to overwhelming increases in water use the availability of surface water is quickly diminishing in many parts of the world. Particularly, as is true in Haiti’s case, as a result of increasing population densities, coupled with deforestation and intensive agriculture, demand for water is overwhelming the balance of hydrological replenishment cycles.¹⁰ Additionally, as I will

¹⁰ In cases of severe deforestation, erosion factors play a key role in the absorption of water. Particularly in Haiti, where the slope of the land is extremely steep in most regions, water runoff is heavily silted and is a major factor in the removal of nutrient-rich topsoil. This then creates a scenario where there is a ‘desertification’ effect on the land; It becomes more arid with no root structures to absorb or slow the flow of rainwater and with nearly barren soil, difficult for crop production.

discuss in Chapter 4: *Great Flows and Cycles: Land, Water, and Culture, The Inseparable Trilogy*, hydrological systems are not closed, independent systems. They are part of the complexities of the local, regional, national, and global ecosystems (see Figure 2.2). Furthermore, the influence of people and cultural impacts on ecosystems must be looked at in order to understand the dynamic interactions of the entire systems.

Freshwater resource availability is a complex issue. The amounts of available freshwater sources are dependent upon precipitation, topography, freshwater sources, and water withdrawals among many other factors (see Figure 2.3 for details). Furthermore, natural resources do not accommodate national, political, or cultural boundaries. Although many man-made borders have been created in accordance with the natural landscape, particularly those that are not easily surmounted like mountain ranges, large bodies of waters, densely forested areas, natural resources are by no means evenly distributed to nations. In the following Chapter, I discuss how some of the issues of uneven resource distribution lead to possibilities for exploitation and also to great power struggles.

Why Water: Issues of Quality and Data Collection Tools

Globally, declining water quality has contributed to an increase in infant mortality, an increase in Cholera outbreaks, as well as increased cases of diarrhea associated with water pathogens from feces and other contaminants. A recent [Scientific American](#) article, "Access to Safe Drinking Water", reveals just how critical safe drinking water availability is:

Today waterborne disease is no longer a major problem in developed countries, thanks to water-purification methods such as filtration and chlorination and to the widespread availability of sanitary facilities. But in developing countries, waterborne and sanitation-related diseases kill well over three million annually and disable hundreds of millions more, most of them younger than five years of age.

It is ironic that while we worry about trace chemical elements in water supplies, hundreds of millions of people face conventional risks of water contamination long-since in the West.

Nearly one out of every three people in the developing world- some 1.2 billion people in all- do not have access to a safe and reliable [water] supply for their daily need. Often, they resort to shallow wells or stagnant pools that are easily contaminated with animal waste. As a result, waterborne diseases account for an estimate 80 percent of all illnesses in developing countries. (Last Oasis, Sandra Postel, 1992).

Although the World Health Organization states that water supplies for use should contain zero fecal coliforms (pathogens), this expectation is unrealistic in ‘developing’ countries. For example, the reality of most Haitians’ lives is that there is neither accessible sanitation, nor is there accessible treated water. According to the 2000 World Bank Haiti Country Profile, only 46% of the Haitian population had access to *improved* water sources.¹¹ Therefore, I was not going to Haiti to test, which sources were contaminated and which weren’t. Instead, one of my main goals was to see how water quality and land-use trends have affected local areas in which I worked. Through observing and participating in local meetings and conversations with locals of both Cayes-Jacmel and Fondwa I was reassured of the local importance of water quality issues. I found that everywhere I went, my research topic peaked curiosity and interest. For some, the results of my research ‘verified’ already existing local doubts concerning the potability of local water sources. Although I never presented myself as an expert, I did feel that my research and what I had to say was both respected and well noted. More importantly however, I feel like I learned a lot from the Haitians I worked with about the relevance and existence of differing perspectives of the natural environment.

For the majority of the world, particularly in non-industrial countries, most water pollution is caused by organic materials. These pollutants include but are not isolated to contamination due to

¹¹ Although the study does not indicate what ‘improved’ means, I would not be surprised if this status did not fit under the World Health Organizations guidelines for drinking water.

feces in the water source (both human and animal), which is directly correlated with population density and sanitation. In Haiti, the overall use of latrines and septic tanks creates a problem for underground water pollution since there are currently no sanitary sewers. According to the Haitian Ministry of the Environment, all phases of production and treatment of solid waste from domestic origin--the main source of urban waste--needs to be studied in depth. The leading cause of infant mortality in the developing world is infectious diarrhea. Subsequently, the prevalence of diarrhea-causing pathogens is directly associated with the quality and quantity of clean water sources available for drinking, washing and bathing (see Table 2.2 for water-related diseases).

Table 2.2 Types of water-related diseases

Waterborne	Diseases transmitted by ingestion of contaminated drinking water. Examples: cholera, typhoid fever, cryptosporidiosis
Water-carried	Diseases acquired by accidental ingestion of, or exposure to, contaminated recreational water. Examples: cryptosporidiosis, giardiasis, Pseudomonas dermetitis
Water-washed	Diseases transmitted person-to-person as a result of poor sanitation due to inadequate quantities of water for washing hands, utensils, etc. Examples: shigellosis, hepatitis A, cryptosporidiosis
Water-based	Diseases caused by pathogens with an obligatory life cycle phase occurring in the water. Examples: schistosomiasis, dracunculiasis
Water-vectored	Diseases transmitted by insects that breed or bite in or near water. Examples: malaria, yellow fever, dengue, African trypanosomiasis

Source Unknown

As is evident in Table 2.2, microorganisms that cause serious disease are often directly associated with polluted water and lack of sanitation. For this reason, I decided that testing for indicators of fecal contamination in my fieldwork would be a direct and influential analysis of the local environmental conditions. The types of testing I did in the field were basic water and soil analysis tests. I used the Hach Pathoscreen Test Kit, which screens for hydrogen-sulfide producing bacteria. These bacteria have been shown to be associated with the presence of fecal contamination and total coliform bacteria in water supplies. This test I used measures ‘indicator organisms’, those

directly associated with the presence of certain pathogens. To me this was important in that in many tropical climates, there are indigenous E.Coli in pristine water sources, which are not indicative of fecal contamination and are not visible to the naked eye.

In addition to contamination by fecal contamination due to lack of sanitation or free roaming animal husbandry, the impact of deforestation, land-use trends, and agriculture have primary affects on water quality in Haiti. Deforestation of hillsides and intensive agriculture lead to a high occurrence of erosion into water sources and drainage areas. This in turn leads to the increased movement of organic materials on the land surfaces directly into the water sources. On the positive side, agriculture in Haiti is usually done without the use of agrochemicals. This was true of 100% of farms that I visited and of local populations that I talked to in Cayes-Jacmel and Fondwa. This lack of chemical usage in agriculture is positive in that there are not risks of nitrate contamination of water sources, or other toxic substances. However, I did not know this before I was in the field, so I brought the Hach low-range Nitrate/Nitrite Nitrogen Test Kit with Colorimeter. In most areas, this test was not applicable. Interestingly enough, many development plans attempting to increase agricultural outputs for the rural poor are implementing increased fertilizer and agrochemical use.

Although freshwater contamination by toxic chemicals from municipal and industrial wastes is not wide-spread at this time in Africa [Caribbean too], future industrialization and associated effluents, and potential expansion of use of agrochemicals to achieve food security, are likely to have serious future consequences for water quality, both for public and environmental health, and for increased toxic contamination of the coastal and marine environment. (Ongly: 1).

For instance, I spoke with Chet from Peace Corps who is working on a reforestation project in the mountains near Fondwa. He said that the program run by COHDEP, a network of U.S. churches uses chemical fertilizers for the fields. According to Chet, he had already—after one year—noticed

excessive algae growth in water canals of the region. This excessive growth decreases the amount of oxygen available in the water source, kills fish and drastically reduces water quality. This misconstrued sense of “modernization” may well prove more problematic than current scenarios to water quality and availability in these “developing” regions. For water purified with chlorine, I used the Hach Total Chlorine Colorimeter Test, which indicated the concentration of chlorine in the water sample. I decided that this was an important test for understanding if purification through chlorination was effective.

The soil tests I conducted in the field were basic Nitrogen, Phosphorous and Potassium tests. I used the LaMotte N.P.K Soil Kit, which indicates High/Medium/Low concentrations of the three fundamental nutrients in the soil sample. I decided it was important to test nutrient availability in the local soils to quantify some of the results of erosion on the regions of Fondwa and Cayes-Jacmel. As I will discuss in Chapter 4, the affects of erosion and nutrient runoff on water quality are important.

Local Responses

Although people of Cayes-Jacmel openly acknowledged problems with their water sources, I felt odd in that my presence and testing seemed to give validity to locals’ previous claims of poor water quality in the area. In that my original intentions were not to be as much of an ‘educator’, but to learn about local perspectives while conducting basic tests of soil and water quality, I was very surprised at both the attention and ‘seniority’ given to me. Moreover, interest extended to local government. I was invited by the mayor of Cayes-Jacmel to discuss my research, results and suggestions concerning water quality in the area. During my stay in the area, I was asked questions ranging from the concentration of chlorine necessary to sterilize water to medical issues (of which I didn’t know the answers!). This role of ‘expert’, which I was neither sufficiently prepared for nor

sufficiently experienced for, to me is indicative of the population of Cayes-Jacmel's previous experiences with foreign aid and foreigners in general. An older resident of Cayes-Jacmel told me that he was wary of foreigners 'testing' their water sources because after one man had come a few years ago, a lot of people in the community became ill. His reasoning was that they didn't know what the foreign 'scientists' were doing, so they had to be wary of them. Following this discussion, it became more evident that I needed to, upon arrival, clarify my motives for being there and that I was not just there to 'extract' information, or data, but that I was really hoping for a reciprocal exchange of ideas and perspectives. In many ways, I think I was successful at doing this. I learned a lot from local people and positive responses indicate to me that I too shared important information and ideas with those with whom I worked.

In the next Chapter, I will examine water quality and availability issues specific to Haiti and will also present some issues pertaining to who maintains control of water and why. This includes some observations of gender-resource related interactions, which I cannot expand upon in this paper.¹² When thinking of water availability and quality in Haiti, some questions I had were: Who has political jurisdiction over water resources? What does the system of water quality look like? How much freshwater is there in Haiti? And where is most of water pollution coming from?¹³

¹² See Appendix IV for more details and thoughts concerning this topic.

¹³ The influx of labor allocation factors into the cycling of resources will be discussed in Chapter 4. I want to attempt to correlate labor interactions to both environmental integrity, and a changing environmental perspective, but also see how the various flowing systems attempt to overlap, and are forced to overlap due to both internal and external pressures.

Chapter 3. The state of the Haitian water sources, quantity and quality

A Snapshot of the Western Hemispheres Poorest Nation¹⁴

Haiti is a land of great paradoxes, great beauty and great sorrow. Historically, Haiti has been considered a symbol of freedom because of its status as the first 'Black Republic', which won her freedom in 1804 through the infamous slave revolts lead by Toussaint L'Ouverture. Under French colonial rule, the flow of commodities was represented through the flux of free labor (slavery) being imported from Africa as material goods. Conversely, natural resources flowed from Haiti to her French counterparts abroad. By the end of the 18th century, St. Domingue (former Haiti) was the world's single most important colony and a major center of organized science in the Americas. In the 1780's, it was the single richest and most productive colony in the world; producing one-half of the world's sugar, a leader in coffee production and a major producer of cotton and indigo (McLellan). Haiti in the past five hundred years, has transformed from the leading colonial producer of goods under French colonial powers to one of the poorest countries in the world. Throughout the transformation, Haitians have continuously struggled for political, social and economic freedom. Like many other former colonies, Haitians have sustained first slavery, then oppression, followed by continuing political and economic dependence due to Imperialistic relations with 'developed' countries.

For many Haitians, Creole remains a true representative of resistance to colonialism and the power of communication. Today, Creole is considered to be the 'mother tongue' of the vast majority

¹⁴ For the full excel table format of this data, see Appendix II.

of Haitians and continues to be a cultural symbol rich with meaning and inference¹⁵ Language gives the individual the means not to recognize himself or herself as other but to recognize themselves as a collective power in a community of transactions and interactions. It may both serve as a border and as a unifier. Language and the communicative powers of a common language allow the individual to place the collective in one's own identity and allows for unlimited access to both knowledge and information.

Haiti, a country of approximately 8 million people covering a 27,750-km² landmass shares the island of Hispaniola with the Dominican Republic. Haiti is located about 60 miles to the East of Cuba and is a short way from the Florida coast.¹⁶ The landscape of Haiti is incredibly mountainous, with 21,000 mountains ranging from 200-2715m in height, making transportation a difficult task. There are approximately 25 planes and plateaus around the mountains often serve as good centers of agriculture.¹⁷ Additionally, the rigid mountains of the Haitian landscape make it difficult to work the land, to reach groundwater resources and the steep slopes magnify already extensive troubles of soil erosion and soil nutrient availability. (Dalvius: 3).

In recent years, increasing economic poverty and the absence of effective government have proven to worsen both environmental and social well-being of the country. As of now, approximately 1% of Haiti's original forest coverage still stands. The very high rate of deforestation and intensive methods of agricultural land-use are both considered as possible causes for the desertification process

¹⁵“ In the Caribbean , over three centuries of resistance to the imposition of the master's language have not resolved this linguistic conflict. As an icon of the struggle however, Creole languages are now the mother tongue of the majority of Caribbean people and the vehicle of rich cultural practices....a lot of people have assimilated the values of the colonizer and consider Creole as a bastardize variety of French, not even a language, sometimes only fit to speak to animals. A continuum of attitudes has thus developed, running the gamut from the opinion just described to using Creole exclusively” (Malena, 49)

¹⁶ Haiti: 20°05' N and 18°02' N (Lat of La Tortue to Cap Gravois)
71°43' W to 74°27' W (Longitude)

¹⁷ These plateaus include: Plateau Central 200,000 ha, Plaine du Norde 93,500 ha
Plaine des Cayes 36,000 ha and Plaine de l'Arbre 32,000 ha

that is overwhelming the country and for the increased masses of topsoil erosion leading to soil and water-quality degradation.

The rainy season in Haiti varies heavily throughout the island due to micro ecosystems created by her mountainous terrain. However, on average the rainy season is from April to May and September through October with the cyclone season ranging from August to October. There are thirty hydrological basins in Haiti ranging from 6828 km² to 1-2 km², with the largest lakes including l'Etang de Miragoan (8.5 km²), Trou Caiman (7 km²), and l'Etang Saumatre (111 km²). (Dalvius: 4). Despite the abundance of freshwater systems in Haiti, the uneven distribution of water resources across the landscape coupled with issues of water quality combine to make potable water an increasingly rare resource in Haiti. As of 1994, only 23% of rural and 37% of urban Haitians had access to what is deemed "safe drinking water". According to the World Development Indicators of 200, 46% of the Haitian population had access to "improved drinking water sources"—Urban was 46% and Rural was 45%. According to the same reports, only 28% of Haitian's had access to "improved sanitation"—Urban was 50% and Rural 16%. As is true with many 'developing' countries, there is not enough financial support or technical equipment in Haiti to truly study the deep-water sources of Haiti. It is much cheaper and easier to access surface water. However, the availability of surface water is quickly diminishing in many parts of the world. Particularly, due to the increasing population densities, coupled with deforestation and intensive agriculture,¹⁸ demand for water is far outweighing the hydrological replenishment cycles.

¹⁸ In cases of severe deforestation, erosion factors play a key role in the absorption of water. Particularly in Haiti, where the slope of the land is extremely steep in most regions, water runoff is heavily silted and is a major factor in the removal of nutrient-rich topsoil. This then creates a scenario where there is a "dessertification" effect of the land; It becomes more arid with no root structures to absorb or slow the flow of rainwater and with nearly barren soil, difficult for crop production.

The absence of sanitation systems, increasing population densities, increasing runoff from erosion and decreases in available water sources are thought to be possible causes to the low access to safe drinking water. According to the World Resources Institute, water pollution from the food industry has accounted for approximately 70% of organic water pollutants between the years of 1975 and 1988. The runner up, the textile industry--baseballs are considered one of the major exports of Haiti to the US--account for approximately 20% of the organic water pollution. As mentioned before, water-borne disease such as cholera, cryptosporidiosis, and diarrheal diseases are on the rise in Haiti and are often fatal for young children and the high percentage of Haitians with HIV who have lower levels of immunities. Additionally, mosquito-borne disease associated with water stagnation, interrupted flow and contamination such as malaria and dengue are occurring at extremely high rates in Haiti. For health reasons alone, it is important to understand where the sources of greatest pollution lie, how Haitians view their environment and what their interpretations of correlations between land-use strategy, management, health and quality of life are.

Haiti is an overwhelmingly rural country—over 70% of all Haitians are agriculturalists. Consequently, what happens in agriculture affects the absolute majority of Haitians and directly affects erosion, water quality and the economy. As the population grows, agriculture has to become more labor intensive, which jumpstarts transformations of the Haitian landscape. With increasing agriculture, forest returns to pasture, pasture gives way to perennial cropping, annual cultures, multiple harvesting, and the soil is more exposed to rain and winds. Additionally, the practice of free husbandry within the hillsides of rural Haiti and even extending to the urban zones of cities such as Port-au-Prince are detrimental to both the purity of water sources and efforts of reforestation.

Flow Diagram (Stella) of Variables Affecting Freshwater Availability, Quality and Land-Use Trends

Policies of “total use” agriculture, forestry, and land-use have contributed to the decimation of both economic and environmental resources. Using three data sets--World Resources Database (WRI), World Development Indicators (WDI), and the World Bank Group Country Profiles—in this section I have created a visual causal flow of variables that directly affect potable water resources in Haiti (see Figure 3.1). As one can see by looking at Figure 3.1, issues of water quality are intricately tied to complex issues of labor, population and land-use trends.

The data sets mentioned above indicate that key sources for water pollution in Haiti lie, not in industry, but in intensive agriculture and lack of sanitation. However, deforestation due to an increasing agricultural labor force and increases in intensity of agriculture are directly related to increasing levels of soil erosion, nutrient runoff, and the overall desertification of the Haitian landscape. This association of deforestation to decreased water supply and, therefore, to increased effects of point source pollution is key to understanding the steps necessary for restoring the Haitian freshwater supply. I used World Development Indicator data concerning trends in labor, population, economic health, national poverty rates, access to safe water, access to sanitation, import/export trends, land-use percentages and consumption trends to create a comprehensive ‘flow’ diagram of how these factors are moving within the larger system (See Figure 3.1).

Table 3.1. Compartments* of Figure 3.1, ‘Where is it Coming From? A Flow Diagram of Population, Labor, Freshwater Availability, Waste Production and Water Quality’

Land-Use Allocation (Hectares)
Total Land
Agricultural
Cropland
Permanent Pasture
Irrigated Land
Forest
Arable Land
Deforestation
Annual Percentage Forest Lost
Fertilizer Consumption
Agricultural Livestock
Erosion
Direct Air Pollution
Methane
Human Waste
Fossil Fuels
Fuel Combustion
Vehicular Use
CO2 Emissions
CO2 Industrial Emissions
Direct Water Pollution
Direct Water Pollution
Sanitation
Organic Waste BOD
Industry Water Pollution
Textile Industry
Wood Industry
Paper pulp Industry
Food Industry
Clay and Glass Industry
Chemical Industry
Metal Industry
Other Industry
Percent of Population with Access to Safe Drinking Water
Total Available Clean Water
Safe Water Urban
Safe Water Rural
Population
Population
Labor
Total Labor
Agriculture
Industry
Water Amounts and Withdrawals
Available Freshwater
Annual Rainfall
Total Annual Internal Renewable Water Resources (cukm)
Annual Groundwater Recharge (cukm)
Annual Withdrawals
Sectoral Withdrawals Percent Industrial
Sectoral Withdrawals Percent Domestic
Sectoral Withdrawals Percent Agricultural
Average Temperature
Evaporation

*Note: Compartments are represented as boxes in Figure 3.1. The circles in the diagram are representative of transitional rates and percentages.

Compartments of the diagram include natural forest, plantation and agricultural land-use trends, original forest cover, renewable water resources, annual water withdraws, annual groundwater recharge, organic water pollutant sources, annual deforestation, anthropogenic greenhouse gas emissions and sources, and total fertilizer consumption (See Table 3.1 for a listing of all diagram compartments). Although time-scale varies slightly between each data set, the average data collection is from 1960-1999. The compartments of Figure 3.1 were organized into sections of Population, Labor, Direct Air Pollution, Direct Water Pollution, Water Amounts and Withdrawals, and Percent of Population with Access to Safe Drinking Water.

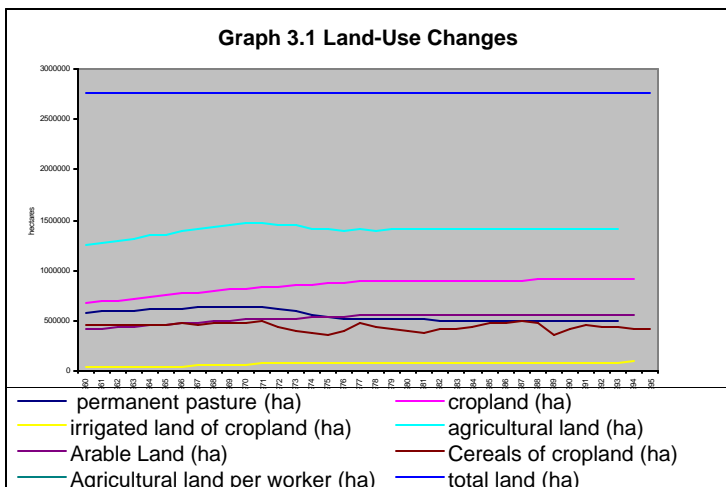
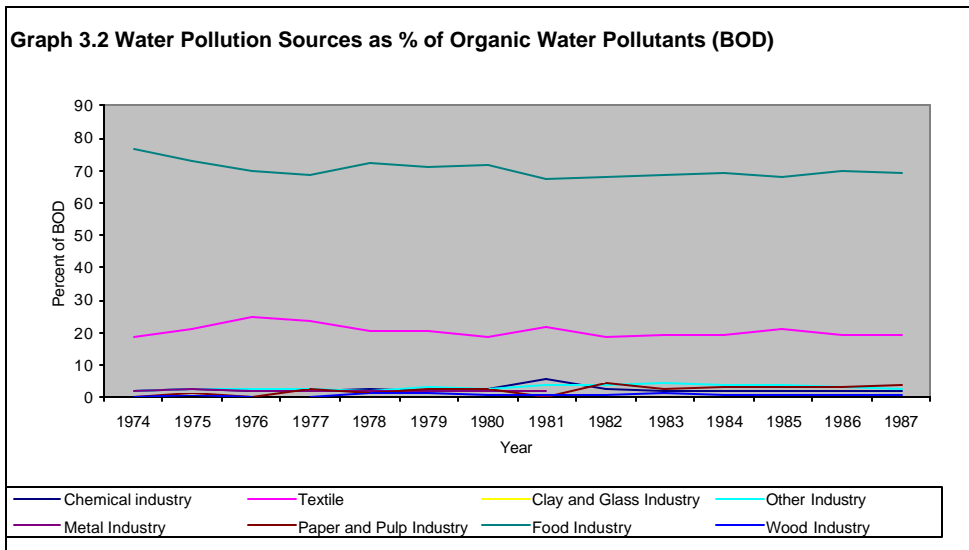


Figure 3.1 is representative of the complexity of relationships between variables directly correlated to water pollution and availability in Haiti. However, this diagram is by no means representative of *all* variables contributing to water quality and availability issues in Haiti. Ideally, this diagram serves to exemplify the complexity of interactions taking place within the issues of water quality. Extrapolation from World Resources Data shows that agricultural extractions and food industry pollutants are the largest contributors to both water pollution and extraction. As we see in Graph 3.1 the amount of irrigated cropland compared to total cropland appears quite low. Annual

withdrawals are 0.4% of the total water resources, however 68% of these withdrawals are agricultural.

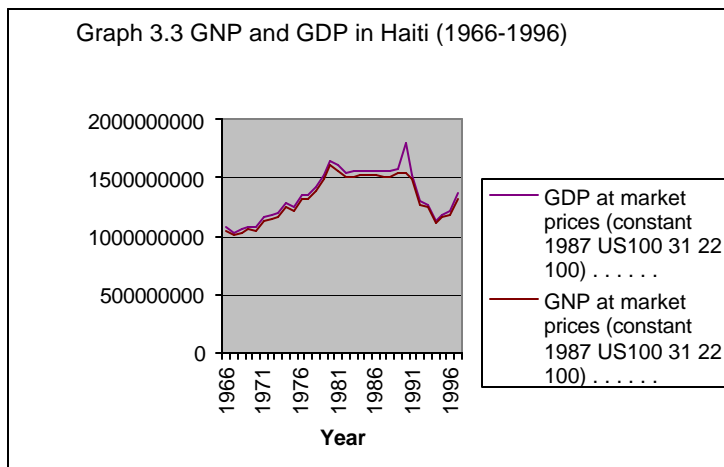
According to 1994 World Resource Institute figures, the forest area of Haiti covered 19,206.7 ha which is approximately 0.8% of the estimated total original forest coverage of Haiti. Food exports averaged 40% of total merchandise exports in Haiti since 1967 and agricultural raw materials exports averaged only 3% of total merchandise exports (See Appendix II for all Excel data charts).



Graphs of land-use trends showed that the majority of Haitian land is allocated to cropland and that agricultural land accounts for nearly one-half of total land coverage of the island—this is assuming a total land area of 2,760,000 ha. However, irrigated land showed to be a small portion of the total agricultural land, leaving room for permanent pasture (See Graph 3.1). The amount of agricultural land in 1961 was estimated as 1,255,000 ha and had increased to 1,405,000 ha in 1994 (see Appendix II). Although there were some drops between the years of 1972 and 1980, the overall trend was positive growth of land allocated to agriculture (Graph 3.1). Fertilizer consumption

increased from 350 to 1398 metric tons between 1971 and 1972 and had an overall increasing trend leading to 4800 metric ton consumption number in 1995 (see Appendix II).

The food and textile industry showed to be the major contributors to organic water pollutants averaging 70% and 20% respectively (See graph 3.2). Other industry was minimal in its production of water pollutants.



GNP and GDP appeared to grow at a relatively steady rate between the years of 1966 and 1981 where both decrease slightly and then stabilized. However, from 1990 to around 1994 both number fell significantly and then started an increase in 1995 (Graph 3.3).

In the next Section I use the data from the heretofore-mentioned data sets and the assumptions of connectivity made in Figure 3.1 to draw some conclusions about the quantity and allocation of water resources in Haiti.

How much water is there and where is it going?

According to the World Resources Institute, there were approximately 11 cubic km of annual total renewable water resources in Haiti. However, as withdrawals for agriculture were 68% of total withdrawals, the percentage of water resource withdrawal was only 0.4%. We can also look at Graph

3.1 and see that although cropland is a major portion (more than half) of the total agricultural land, thereby about a fourth of total land-use--the amount of irrigated land is low. This indicates that although the majority of land is being allocated for agriculture, this is not stressing the *amount* of water of the total renewable water supply (see Table 10, Appendix II).¹⁹

The immense amount of land allocated to agriculture is a key source of water contamination due to nutrient runoff and erosion. Haiti's landscape is very mountainous with two main mountain ranges. This heterogeneous landscape has made 'low-erosion' techniques of farming and land-use difficult and labor intensive. Furthermore, steep-slope agriculture tends to exclude the use of heavy machinery and even animal-assisted farming techniques.

Figure 3.1 shows both a conceptual flow between population, agriculture and erosion, but also points out the correlation between average temperature and water availability. Increased temperatures heightened by deforestation lead to increased levels of evaporation of surface water, as well as decreased precipitation. Therefore, global and local temperature changes in the Caribbean region are important for predicting changes in the amount of water available to the Haitian population. Moreover, the rate of water withdrawals is directly interrelated with increasing population and increasing numbers in the labor force (both agricultural and industrial). Thusly, increasing population means a larger strain on the water resources. Following, as the amount of available water decreases the affect of pollution increases exponentially--less water with the same amount of pollution results in a more contaminated water source.

Because approximately 70% of the Haitian labor force is in agriculture, implementation of restorative farming techniques would have to take into account the large-scale effects on both amount of available water and the quality of the water. With half of Haiti's land being allocated to agricultural

¹⁹ We could then assume that the amount of water may not really be the limiting factor here (however, the process of desertification and deforestation may lead to decreased precipitation and a reduction in the amount of total renewable water

land, an increase in water demand has both a large impact on the total available renewable water sources and on the economy of the island.

Major Sources of Pollution

In order to evaluate water quality it is important to understand watershed processes specific to the region being studied. These characteristics include, basin characteristics, biosphere, carbon cycle, climatology, geology, geomorphology, human and natural interaction, meteorology, nitrogen cycle, oxygen cycle, phosphorous cycle, soil relations, water cycle water vapor. However, as I have done in Figure 3.1, it is possible to estimate major sources of water pollution through comparison of observed data and an understanding of cause and affect relationships within the system.

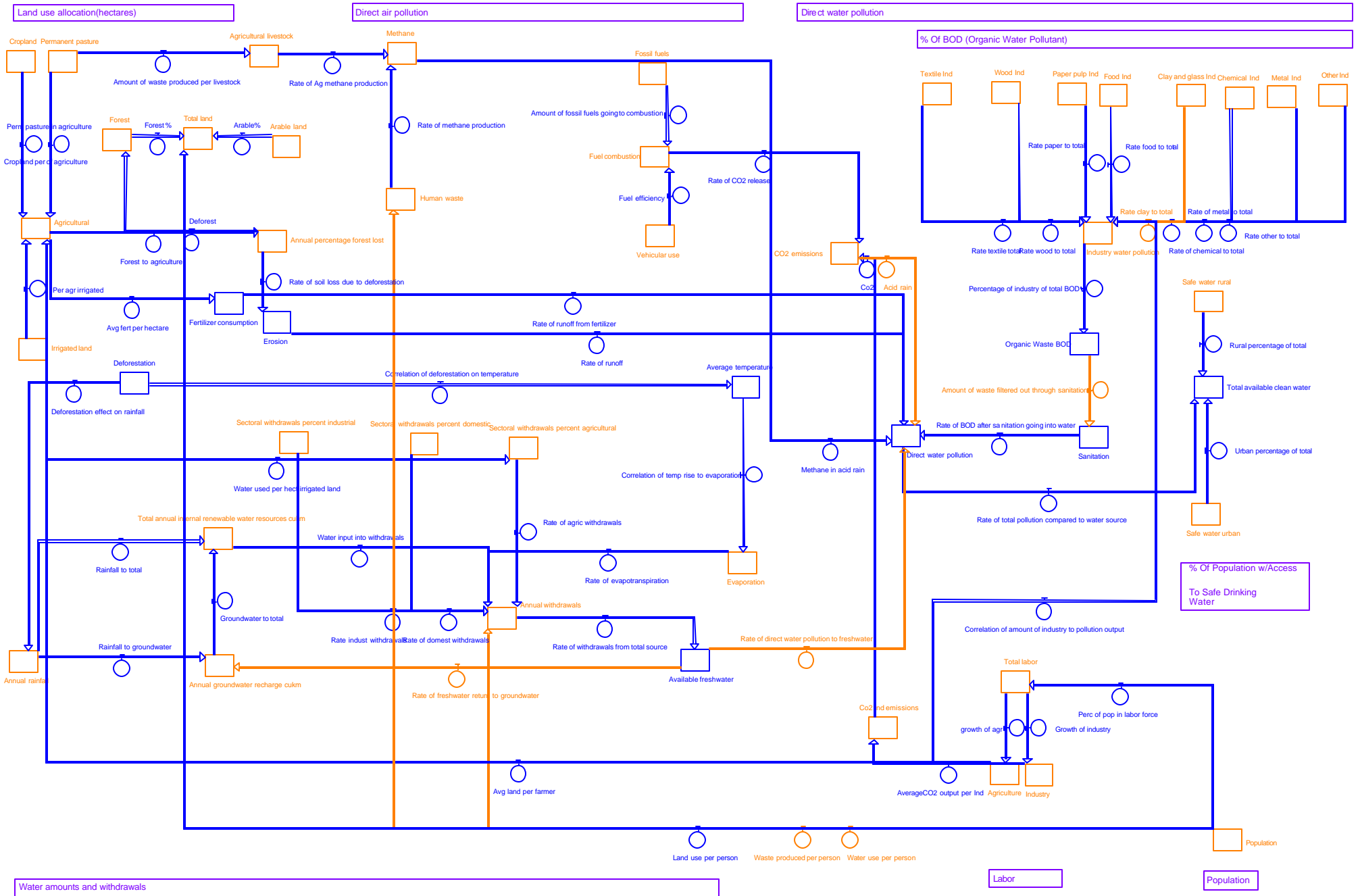
In Haiti, it is evident that there are two--if not three--major sources of water contamination. Pollution going directly into the water is that from the agricultural industry via changes in land-use trends and feces runoff from poorly planned grazing areas. Although approximately 4,800 metric tons of fertilizers were used in 1995, I would like to argue that it is the erosion of land and poor planning of areas for grazing animals that most affects the water quality in rural areas--In urban areas, there would be more of an emphasis on industrial runoff and lack of human sanitation. Food exports are 40% of total merchandise exports and are major sources of capital for rural Haitians. Consequently, the WRI data indicates that the food industry produces 70% of the total organic water pollutants. (See Appendix II for WRI data spreadsheets). How then can the level of agriculture be sustained while decreasing erosional factors? Some possible solutions may be to create forest borders for cropland, multicrop rotation, terracing in mountainous areas (how costly and labor intensive would this be?) and attempting different species of crops (ones that provide both food and that have inherent exchange-

resources. For this, it is important to find data on changes in average precipitation).

value for the community). It is also important to look into the reasons for deforestation. Haiti is considered the poorest nation in the Western Hemisphere and this economic situation makes daily life a priority, not necessarily environmental concerns. Unfortunately, on an island with very limiting resources, increases in agriculture result in drastic decreases in forest coverage. Additionally, charcoal made from the cutting and burning of trees is both a source of fuel for cooking and one of the primary sources of money for the rural Haitian.

Some changes that may be useful in reducing the amount of erosion and feces runoff into water sources may be to specifically plan for “barrier zones” of increased natural vegetation around crucial water sources. This would also aid in reducing grazing around watering holes. Additionally, multicrop agriculture—which is already in practice--and forest/large tree bordering may aid in topsoil restoration as well as overall crop productivity. However, I strongly believe that change on any scale within a community either needs to be *enforceable* or *accepted* by the majority of the population. In Haiti, political organization and infrastructure is minimal if any and, therefore, governmentally enforced policies are limited. There are, however, numerous ‘grassroots’ and social change organizations around Haiti working towards environmental, health and social restorative processes. Unfortunately, action initiatives do not often extend beyond local scales. I believe that local farmers need to be questioned about their reasons for working the land following particular methodology, how they perceive their local and the global environment, and whether they think that changes in land-use trends and environmental restoration of the Haitian landscape is necessary. What needs to occur is a dynamic form of environmental education that involves some teaching and a lot of listening.

Figure 3.1. Where is it coming from? A Flow Diagram of Population, Labor, Freshwater Availability, Waste Production and Correlation to Safe Drinking Water



Water Control

The lack of clean water is at the root of many of the hardships of the rural poor. Many Asians who do not have access to potable water have to buy it from vendor at an exorbitant cost, while wealthy citizens hooked up to city systems can take advantage of subsidized water...water is a prime commodity, often at the expense of the poor. The price rises as the water gets farther away (Water: 46).

In Haiti, during the Duvalier period in the 60's, 70's and 80's water turned out to be as serious a problem as that of food. In principle, the water supply in Port-au-Prince was handled as a public service, but in practice it had been privatized, legally or illegally. The result was a highly uneven distribution of water; with mainly high-income households receiving water via the official network while poor people paid very high prices.

In the neighborhood investigated, on average 13.5 per cent of the total income had to be spent solely on water, with two-thirds paying more and the poorest at times reaching the abysmally high figure of 20 percent. In the meantime, the official distribution network was decaying for lack of maintenance. (Lundahl: 24).

In the aftermath of political dictatorship, issues of water control and availability continue to be problematic in Haiti. Water, acknowledged as a necessary resource for all living things, is easily equated with power and overarching control. For these very reasons, it is important to better understand the basic control structure in Haiti in order to understand some possible reasons for the quality, or lack thereof, of water in Haiti.

According to the SNRE (National Service of Water Resources), Haiti records an average of 41.2 billion m³ of rainwater per year of which 29.09 billion m³ is returned to the atmosphere through the evaporation and transpiration of vegetation. Additionally, of the 12 billion m³ of water remaining, 4 billion sinks into the soil and only 1 billion of what is left is used for irrigation or water supply purposes. However, according to a 1996 report of the World Health Organization, Haiti was described as a place where the national services for the provision of drinking water met less than 50% of the

needs of the population. According to experts at SNRE, this is due to the lack of water management policies in the Haitian government.

This situation is not only linked to the lack of means such as necessary investments in the sectors of water exploitation and treatment, but also to the lack of resource management policies. At this level of water resource exploitation, a real chaos exists in the country, due to the absence of a legal framework, which would authorize one and only one institution that is able to implement all appropriate studies, with their management and exploitation. (Ivelt Chery, Director of the National Service of Water Resources)

Accordingly, the arbitrary distribution of water rights to many organizations and corporations lends itself to a system where water is not allocated evenly and where technical expertise is often lacking.

Table 3.2. Freshwater availability and water use (data from 1995)

Freshwater availability (total domestic/external in million m3)	12,000
Annual withdrawal of freshwater as % of available water	10 %
Water Use in Millions of Cubic Meters:	
Port-au-Prince	36,0
Other Towns	26,0
Rural Areas	1818,0

(From Haitian Ministry of the Environment *Environmental Report: 1999*)

Although the SNEP is a component of the Ministry of Agriculture Natural Resources and Rural Development (MARNDR), there are numerous other water management companies in Haiti including: the National Service of Drinking Water (SNEP), which covers ten cities in the provinces and the Metropolitan Autonomous Station for Drinking Water (CAMEP), a commercial organization which covers the Port-au-Prince area. According to the Haitian Ministry of the Environment's (MOE) 1997 Status Report, only twenty percent of the Haitian population was served by public waterworks in 1995. In the cities, 30% of the population was served, with 25% of the population in Port au Prince using public fountains or wells only (see Table 3.2). In 1995, the MOE did not yet have authority for National Water Management. Instead, there were and remain to be other select agencies that deal with

water supply issues. In Port-au-Prince, CAMEP is the agency delegated to water supply, monitoring and statistical analysis, in all other towns, SNEP is responsible, and in rural areas POCHEP.

Additionally, most NGO's working in Haiti reportedly are involved in supplying water to the rural population while working on sanitation and environmental issues. Many of these organizations, although meaning well, construct water capture systems without knowing the hydrological data for the area, such as the levels of reserves. Furthermore, fountains in many regions are either not well installed or often have not been maintained and are a source for the waste of water--with water running at all hours of the day and not dependent upon usage.

The shared, uncontrolled management of Haiti's water resources coupled with a lack of management policies leads to unstable and uncertain access to potable water. Additionally, the lack of regulations loosens health standards--when even applicable--which is most likely to affect poorer populations and habitually leads to the privatization of water resources. As a result, the cost of water is likely to continue to increase as quality and availability decrease. These problems particularly effect the rural poor who are often located farther from water sources and from the management areas, creating not only a disproportionate allocation of wealth, but also a disproportionate allocation of natural resources necessary to sustain human life.

In this Chapter, I have both outlined some of my own personal connections to Haiti and have emphasized some of the key quantitative and qualitative data concerning environmental quality in Haiti. In the next Chapter, I use the data presented in this Chapter to qualitatively analyze the structures and systems surrounding water quality issues. Additionally, I show by example how the multifaceted incorporation of both what is classified as 'cultural' and as 'natural' is necessary for understanding whom and what is affecting environmental quality in a specific region. I do this by analyzing numerous 'flows' and 'cycles' within the larger system. Furthermore, I question the reasons

behind creating these systems and whether they encourage greater understanding of local environments or whether they are excluding key elements of 'natural' and 'human' processes.

Chapter 4: Great Flows and Cycles: Land, Water, and Culture, The Inseparable

Trilogy

Apart from the fact that systems of classification, like languages, may differ with respect to arbitrariness and motivation without the latter ceasing to be operative, the dichotomizing character which we have found in them explains how the arbitrary aspects (or those which appear to us arbitrary, for one can never be sure that a choice which is arbitrary for the observer may not be motivated from the point of view of indigenous thought) come to be grafted on to the rational aspects without altering their nature. I have represented systems of classification as 'trees'; and the growth of a tree is a good illustration of the transformation just mentioned. A tree is, as it were, strongly motivated so far as its lower parts are concerned: it must have a trunk and the trunk must be nearly vertical. The lower branches already allow more arbitrariness: their number, although it may be expected to be limited, is never fixed in advance, nor is the orientation of each and its angle in relation to the trunk. But these aspects nevertheless remain bound by reciprocal relations, since the larger branches, given their own weight and the foliage-laden branches they hold up, must balance the pressures, which they apply at the common point of support. The part played by motivation, however, diminishes, and that of arbitrariness increases progressively as we turn our attention higher: the terminal branches can no longer compromise the tree's stability nor alter its characteristic shape. Their multiplicity and insignificance has freed them from the initial constraints and their general distribution can be explained either as a series of repetitions, on an ever diminishing scale, of a plan which is also written into the genes in their veins or as the result of statistical fluctuations. The structure, intelligible at the start, in branching out reaches a sort of inertia or logical indifference. Without contradicting its primary nature it can thereafter undergo the effect of multiple and varied incidents, which occur too late to prevent an attentive observer from identifying it and classing it in a genus (Savage Mind, Levi-Strauss: 159-160).

Systems and Classification

A system is a group of interacting, interrelated, or interdependent elements forming a complex whole; An organized set of interrelated ideas or principles; A condition of harmonious, orderly interaction. (American Heritage Dictionary, Fourth Edition).

The first steps to synthesis are separation and articulation. Levi-Strauss' 'tree' of classification is not merely a method of organization of knowledge; it too is a classification structure of *perceived* knowledge, which cannot escape the boundaries of cultural specificity. Furthermore, in the above quote Levi-Strauss creates a dichotomy between arbitrary and motivated actions. He wisely points out

that motivation may lie in intentions of the *actor*, but is often overlooked by the *observer*. Like the tree with its trunk and branches, in order to understand the ‘big picture’ it is often helpful to branch off and look at smaller, related compartments. As a result we create systems in which we categorize, subdivide and organize our perceptions of ‘fact’ in hopes of better understanding our environment and ourselves. As I did in the previous Chapter, we like to create models---or visual representations--of the systems we are trying to understand. This phenomenon reaches across all disciplines—anthropology, environmental sciences and biology alike. However, these models are often exclusive by nature in that they are limited to one or two perspectives and rarely reach beyond the facets of a specific discipline. Although many of these models are useful and applicable in synthesizing difficult concepts and presenting structural analysis of these aforementioned systems, I think it is crucial to realize that the models, charts, and overall analyses are directly and heavily influenced by the perspective of the observer and are, therefore, limited by definition. They are interpretations and translations of observation within the greater context of the observer’s cultural, educational and personal perspective. These models are based upon observation, analysis, and perspective, perspective that is constructed through the life-long processes of relating as a human being within a place. In other words, these models are not systematic, ordered representations of ‘fact’. Subsequently, each *place* maintains uniqueness in scale, locality, and history with resultant local perspectives that are also particular to the context of the locality. Through our ‘places’ in life we thereby construct databases and systems of knowledge, which reflect both our interactions with, and knowledge of, our surroundings. As Latour remarks in his analysis of conceptual oppositions within Western Ideology, the natural/social dichotomy is part of a greater attempt of creating a system of environmental understanding.

Just as the adjectives ‘natural’ and ‘social’ designate representations of that which are neither natural nor social in themselves, so the words ‘local’ and ‘global’ offer points of view on networks that are by nature neither local nor global, but are more or less long and more or less connected. What I have called the modern exoticism consists in

taking these two pairs of oppositions as what defines our world and what would set us apart from all others. (Latour: 122).

In agreement with Levi-Strauss' views of 'motivated' versus 'arbitrary', Latour's 'modern exoticism' reflects the arbitrariness of classifications. I argue that the separation of 'natural' or 'social' (nature/culture) is not 'arbitrary' as Latour proposes, instead this dichotomy is *motivated* by our own culturally biased perspective of the natural world. We justify this crucial separation as an inherent definition of our world, just as we justify our assumptions of one predominant, homogenous world point-of-view. As an alternative to a synthesis of concepts, this separation results in the permanent exclusion of the dependency of our lives as human beings on the well being of the environment.

In the following Sections, I consider some of the 'systems', particularly agricultural ones, involved in the complex issues of water quality in Haiti. As I discussed in the previous Chapter, these issues are neither isolated, independent systems nor are they completely interdependent, cooperative systems. Instead, they are a series of complex cycles and flows, which are part of both 'nature' and 'culture' categories and which overlap throughout their various stages. In this Chapter, I outline some of the systems involved and analyze some of the assumptions being made about these systems' movements by 'local' and 'global' perspectives. What is important to remember about this Section is that the complexities of these systems are not uniformly distributed, nor do they neatly fit into the ordered expectations of their proper categories. In the first Section, '*Flows, Cycles and Renewals*', I discuss concepts of flows, such as labor, population, cash and nutrients. Additionally, I separate the cyclic properties of the Haitian landscape, such as the Hydrological Cycle, nutrient and agricultural cycles.

Nutrients, Capital and Technological Change

Flow: 1a. To move or run smoothly with unbroken continuity, as in the manner characteristic of a fluid. 2. To issue in a stream; pour forth. 2. To circulate, as the blood in the body. 3. To move with a continual shifting of component particles. 4. To proceed steadily and easily. 5. To exhibit smooth or graceful continuity. 6. A continuous output or outpouring. 7. A continuous movement or circulation. 8. The sequence in which operations are performed. (American Heritage Dictionary, fourth edition).

The above definition shows how the concept of flow both represents linear/sequential movements, cycling and fluidity. What then does it mean when we use ‘flow’ to describe the movement of materials and systems? And what are the conflicting structural elements of these cycling and flowing materials?

All economies and especially agricultural ones are dependent on the natural environment for their sustenance, so that economic change is best visualized as development in geographical space. (From States and Social Evolution, Williams: page unknown).

Environmental structures and channels directly mediate the flow of agrarian energy and the rural economy. There are specific structures that are leading rural Haitians to the flow of cash and commodities. Cash flow is not an inherent attribute of farming. Through exchanges within small-scale rural markets, imported and non-local commercial goods institute the need for currency and currency exchange. Although I cannot explore the complexities of the Haitian market system--predominantly run by rural Haitian women²⁰--in this paper, I do want to emphasize it as a key economic structure linking rural Haitians to cash flows.

Within the Haitian landscape the flow of soil nutrients is directly affected by the intensity of land cultivation, which in turn directly affects the need for extensive cultivation for production.

Intensive cropping is independent of food needs. In a subsistence farming system there is no need to produce excess. However, where there is a cash market, there is no ceiling to the intensity of the farming of the land. (Murray: 55). During my fieldwork, I realized that although the farms in Cayes-Jacmel and Fondwa were of fairly small scales, there was a surplus being produced--albeit a small surplus. The flow of cash from the markets was not, however, being put back into the agricultural process--It was not cycling to increase the productivity of the land or to increase the size of the farmer's landholding. This means that the money being exchanged was not being put into new equipment, labor costs, or new farming techniques. One reason for this may be that there is not *enough* cash flow to provide for these changes. Furthermore, as I mentioned in previous chapters, massive erosion and steep-sloping plots make the use of heavy machinery impractical. Without learning methods of maximization and increased production that systematically replenish nutrient levels in the soil, increasing intensity of agriculture leads to erosion, the outflow of nutrients from the soil coupled with nutrient depletion, and decreased production.

When the population grows, so does the labor force. With nowhere for this labor to go in a constant land area, the man/land ration must increase in agriculture, i.e. the cultivation techniques become more labor-intensive. Products of a more labor-intensive type are thus substituted for those requiring less labor per hectare. Schematically, this imposes the following temporal sequence on a given plot: Forest, pasture, land-intensive crops, labor-intensive crops, eroded land (Lundahl: 37).

So, we see that there is a direct link between the flow of population and labor into agriculture and the erosion of the land. Figure 3.1 shows how there are direct ties between the flows of nutrients, erosion, and the quality of water. As erosion increases and the flow of essential soil nutrients run down the hillsides, the increased erosion leads to the increased silt and contamination of water sources. Hence, we are seeing the flow of materials such as cash, soil, nutrient, labor and water.

²⁰ See Appendix III for further analysis of the importance of the woman in the Haitian economy.

Technological change requires capital. In Haiti, there is a surplus of labor. However, credit and capital are hard to come by. Agricultural credit from formal sources is very restrictive for the rural farmer. This is because the type of credit available is almost always limited by both amount and length of borrowing time. Additionally, high interest rates create a situation where the amount of money the Haitian farmer must pay on interest for borrowed money far outweighs the increase in production created by the purchase of new technology. One of the largest factors contributing to high interest rates is the focus on short-term rather than long-term spending. This is a necessary concern for most Haitian peasants in that they are living on a survival basis and have little on which to fall back. As standards of living deteriorate, the niche available for the creation and implication of new technologies is slowly diminishing. Resources are being transferred from activities focusing on future productivity and are being used for increased current yield and higher consumption. Unfortunately, these trends result in a cumulative decrease in both standard of living and environmental health. (Lundahl).

It is important to remember that technological change in agriculture is applicable only on a very local scale. The amount of risk the farmer has to undertake in the face of change is very high. It is not enough to present an abstract idea to a farmer and expect them to risk their entire livelihood and family's well being on that recommendation. It is crucial for the agriculturalist to be able to decide for themselves the efficacy of new agricultural ideas or technologies. Furthermore, both environmental and social conditions are variable throughout the Haitian landscape. Likewise, each individual or community may have differing ideas on the length of time they want to attempt to apply this new technology.

In this Section I have focused predominantly on cash flow in relation to nutrient flow and technological change in Haiti. I proposed that cash is not cycling into agricultural systems. In the next Section, I offer some potential channels of ‘cash flow’ for the Haitian farmer.

Where is the money going?

According to Murray, rural Haiti exemplifies a cash-oriented livestock economy where livestock often serves as a ‘bank’. Cash profits may be used to invest in animals such as mules, cattle, goats or pigs, some of which are used to decrease transportation labor (mules) and others that are used as sources of food. (Murray: 56). With increasing amounts of cash flow from external institutions, there is also an increase in the extraction of resources through increased cultivation in the hopes of increased production. Moreover, external institutional structures—despite the fact that they are in Haiti for the purpose of ‘aid’--are known to siphon off resources in the pursuit of institutional or personal objectives. Unlike most development efforts, it is important for cash flow to be allocated to parts of the system that are already commodity related (i.e. the market systems) and to install more knowledge-based capital in areas of agriculture and land-usage. In other words, many of the ecological issues at hand are a direct result of not only the lack of funds, but also the misallocation of funds and resources. The problem then is not as much that the already existing structures cannot work; it is that the agricultural systems are treated as isolated entities rather than as members of, and contributors to, many cyclic processes including the Hydrological Cycle and soil nutrient cycles.

In the following Section, I examine these related cycles and show that there is a distinctive difference in the categorization of variables into flows and cycles.

Cycles and Renewal: The Fallow Cycle

Cycle: 1. An interval of time during which a characteristic, often regularly repeated event or sequence of events occurs. 2a. A single complete execution of a periodically repeated phenomenon. b. A periodically repeated sequence of events. 3. The orbit of a celestial body. (American Heritage Dictionary, fourth edition)

In the previous Sections, I discussed unidirectional nature of ‘flows’ such as capital and nutrients. In this Section, however, I focus on ‘cycles’ and their roles in the environmental systems of the Haitian landscape. By definition, these cycles are directly associated with concepts of renewal and ‘repetition’. I would like to show how ‘flows’ and ‘cycles’ are not only culturally specific, but are also overlapping throughout their movement. I do this through a discussion of the placement of the Hydrological Cycle within the greater system of agriculture and emphasize the importance of the interactions between the Fallow Cycle, Hydrological Cycle, and the Haitian landscape.

The cutting of trees is not inherently problematic; it is the elimination of the fallow cycle, which would permit soil restoration through the growth of trees. (Murray: 7).

The Fallow Cycle that Murray speaks of is part of a repetitive cycle of cultivation and uncultivated plots. When plots are allowed to remain uncultivated so that nutrients may be replenished, this is called fallow. The period of time needed for land nutrient replenishment varies depending on where the fields are located, the intensity of agriculture techniques and the types of crops that are being planted there. Up until now the integration of the tree into the cash flow regime of the rural Haitians has been done in a fashion that prevents its simultaneous functioning as a soil-preserving and soil-regenerating mechanism. Allowing for the cycling of nutrient replenishment results in a system where the tree can be used simultaneously for both economic and ecologically restorative measures. The general critique is to cease promoting the tree among rural Haitians as a

sacred, untouchable legacy for future generations in that many are living on a day-to-day survival basis. However, according to Gerald F. Murray, an anthropologist who conducted numerous field studies in Haiti concerning reforestation, there should be a promotion of the planting of fast-growing wood as a privately owned cash-crop planted by rural Haitians on their own land.

If certain anthropological insights were applied and certain institutional barriers removed, a flow of resources would be activated, and Haitian peasants would plant millions of trees on their own land. (Murray: 38).

Because only 1% of Haiti's original forest coverage still remains, a community that is able to develop a cash-crop tree production industry would be opening up an entirely new national market. Therefore, the potential for economic gain is very high.

The Fallow Cycle directly affects nutrient flow, land-use techniques, deforestation and the Hydrological Cycle (see Figure 3.1). Likewise, the movement of water on a local scale is often described as 'flow'. However, as I discussed in Chapter 2, the movement of water is not restricted to the flows of streams and rivers. There are many other forms of water movement contributing to the greater movement of water within the Hydrological Cycle: There is movement of water by evapotranspiration, which is dependent upon vegetation quantity and quality. There is evaporation, which is dependent upon surface temperatures. And there is movement of water through precipitation, which is due to cloud formation and is directly correlated with forest coverage.

In this Chapter, I have discussed the movements of people, labor, land, water, plants, and money. The interchangeability of nutrients, goods, currency and ideas are not restricted to static boundaries. Boundaries of all types--political, ecological, and social--are inherently dynamic. Mountains move and shift over time, rivers expand and contract, politics change, and societies transform. Most importantly, relationships between man and nature are parts of dynamic systems of interactions. Therefore, in order to understand one component of the system, it is not possible to

isolate them from the rest of the system while maintaining structural integrity. For these reasons, when looking at issues of water quality and availability, one must look at other components of the system like land-use, forest coverage, population, labor and religion.

In the following Chapter I present the results of my fieldwork in the Southern coastal town of Cayes-Jacmel, Haiti. Chapter 5 focuses on issues of water quality in this region and responds to some of the questions I had before, during and after my fieldwork in Haiti.

Chapter 5: Fieldwork and Results in Cayes-Jacmel, A Southern Coastal Town in Haiti

Description of the Region

Cayes-Jacmel is a region directly to the east of the city of Jacmel along Haiti's Southern Coast. According to the local 1996 census provided by the mayor of Cayes-Jacmel, Ernès Fils, the population of Cayes-Jacmel is 32,045, with a population composed of 14,473 men and 17,572 women. In Raymond, a section of Cayes-Jacmel where two water samples were taken, the population was 8,332 with a composition of 3,785 men and 4,547 women. Historically, this section of Haiti's Southern Coast has been hardest hit by hurricanes and other natural disasters due to the settlements proximity to the shoreline. I was brought to Cayes-Jacmel to participate in a Disaster Prevention Training Workshop for the Center for Development and Human Resources (CDRH). The purpose of the Workshop was to instruct local community leaders in how to organize and prepare in the case of a natural disaster.

The area surrounding Jacmel is heavily forested compared to other regions of Haiti. According to Jean-Sébastien Roy, the Director of CDRH, the reason behind this is that the French protected the area during the Colonial Period and, for reasons, which he did not clarify, it continues to be fairly protected from the rampant deforestation affecting the rest of the country. While I was conducting my own personal research in Cayes-Jacmel, I was asked to make a presentation to the workshop members concerning my studies and informing them about both the results of water quality tests I conducted in the area and of some of the preventative methods and solutions I would suggest. In Chapter 2, I outlined most of the background information I presented to the community of Cayes-Jacmel. This included information concerning water-borne disease, reasons for the contamination of water sources

and purification methods.²¹ In the following Sections, I present the data that I found concerning water contamination in the region and talk further about my interaction with CDRH.

Figure 5.1 Example of Source ‘Capture’ of Cayes-Jacmel



In Cayes-Jacmel they have begun collecting water in covered reservoirs in cooperation with some engineers from Jacmel, the nearest city. A system of PVC pipes is used to transport water from the ‘captures’ (see Figure 5.1) to the fountains in the center of town and near local houses. According to my guides, there were large calcium deposits/buildups in the PVC’s. Some of the community members were concerned about the PVC’s and their condition in relation to the mineral deposits and buildups. I remarked that it was very important in order to prevent contamination of the water sources to regularly check the condition of the PVC piping all along the path of the water, particularly in jointed areas where leakage and, therefore openings for possible contamination, are more likely to occur.

Throughout my field research in Cayes-Jacmel, I was not only accompanied by a guide, but was also confronted with a ‘hierarchy’ of protection of the water sources. When I first arrived in

²¹ See Appendix VI for examples of water purification methods.

Cayes-Jacmel with the CDRH training group, I was told to begin taking samples at the main water faucet in town (Site 3). As I began to take samples, people began to gather around me, which to me indicated curiosity. However, as I continued to run my tests one of the men in the crowd asked if I had permission to take samples, questioned my purpose for being there and told me that I would have to speak with the mayor of Cayes-Jacmel about these issues. A few moments later, as I was packing up my things, a member of the CDRH Training Workshop came over and explained that I was with the group and that there was no need for people to worry. In retrospect this event indicates to me both the existence of local water control hierarchies in Cayes-Jacmel and the community's perception of the importance of local water sources. After the man apologized to me, he explained that researchers there had come to Cayes-Jacmel in the past to 'take samples' and shortly after they left many people of the community became ill. Clearly, the locals didn't want this instance to be repeated so they were wary of 'research' and of foreigners in their village. This initial encounter with local custom, pessimism and authority opened my eyes to the importance of making my motives clear upon arrival in a community. It also reinforced for me the value of giving credit and respect to local customs and to being sensitive to local powers throughout my field research.

Figure 5.2 Examples of Trash Collected near Water Sources, Cayes-Jacmel and Port au Prince (Left to Right)



Upon arrival in Cayes-Jacmel, I was shocked to see eight-year-old girls sweeping trash onto what could have been a breathtaking beach. I soon found out that there is no sanitation infrastructure in Cayes-Jacmel, Fondwa and even in many areas of Port au Prince where the garbage is merely dumped on the streets or in a ravine (see Figure 5.2). As a result, Styrofoam containers litter Cayes-Jacmel's scenic coast.²² In my presentation to the Cayes-Jacmel community I outlined potential ways to prevent water-borne diseases, placing some emphasis on the role of trash and water stagnation in relation to the breeding and development of malaria-carrying mosquito larvae. Additionally, I remarked on how piles of trash not only collect water, but if near water sources are likely to clog open flowing water and create stagnant pools, which are unsuitable for cleaning, drinking or bathing. Additional suggestions included prevention of erosion along watershed areas that would help to prevent disaster impacts and the contamination of water sources.

Some questions I had during field research:

During my fieldwork in Cayes-Jacmel, I wanted to analyze water sources for fecal contamination, agricultural chemicals--including the contamination of nitrates and nitrites, which are residuals of pesticides and some fertilizers--as well as the presence/absence of hydrogen-sulfide producing bacteria, which are indicators of fecal contamination of water sources. For already treated water sources--those that have been treated with chlorine--I used the Hach chlorine colorimeter to determine if chlorine levels were adequate for proper purification of water sources. Questions that I wanted to explore concerned the species of flora and fauna near water sources and the types of diseases in the region associated with water contamination. Additionally, I was curious about the type

²² The house I stayed in belonged to Jacqueline, one of the local women who was known for her cooking and her freezer in which she stored homemade coconut slushies. In her back yard was where the meetings took place in a large, open air veranda by the ocean. During the days of workshop, women organized by another local group IPDG made meals of fried

of farming present in the potential runoff area near the water source, which included the types of fertilizers, pesticides or herbicides used. These were all questions I had before conducting field research. I discovered that some of the questions including that of nitrate/nitrite levels and those concerning fertilizer, herbicide and pesticide use were not applicable with the water sources I tested. Following, I have coupled some of my initial questions upon arriving in Cayes-Jacmel with answers based upon conversations with local residents and personal observations:

Is there an organized dump for sanitation? Is it located down hill from water sources and is there some method of sand or other filtration to help prevent leakage of fecal materials into the water sources? According to my observations there are no formal ‘sanitation’ or waste disposal systems in the area. The majority of houses had makeshift outhouses. Many of these were subsequently located near water sources such as faucets and streambeds. In the house I stayed in there were two ‘outhouses’ constructed of plywood walls and palm-leaf roofs. Inside the stalls, there was a stone pedestal for sitting and a pit beneath. One of the outhouses was located approximately ten feet from the faucet used for washing, drinking and cooking water. I don’t think that there were any methods of containment installed in these structures, which means that feces and bacteria were readily absorbed by the soil and were, therefore, likely to contribute to the contamination of water sources. One positive aspect of the Cayes-Jacmel region is that due to its proximity to the shore, the soil in the area tends to be very sandy. This may act as a natural filter for some waste materials.

Do people boil their water? According to those I spoke with in Cayes-Jacmel, most residents do not boil their drinking water. There are many reasons for this. One of the primary reasons is that fuel (timber) is both rare and expensive in Haiti. This makes the use of fuel when not absolutely necessary wasteful. At the same time, residents of Cayes-Jacmel showed great concern about water

plantains, pickleaz (spicy cabbage and carrot relish) and whatever meat was available for the entire workshop. These meals were packaged in the styrafoam containers and subsequently discarded, each day.

quality in their region. When I made a presentation to the leaders of the area, they appeared surprised to know that diseases such as cholera and typhoid were almost always contracted due to fecal contamination.

Is there any access to chlorination methods, fluoride for teeth? Although I did not hear any mention of fluoride, some in the area added chlorine to their drinking water. According to one farmer, he used two drops of chlorine for a gallon of water. Recommended health standards claim that it is necessary to put as much as 16 drops of chlorine in untreated water in order to kill all potentially harmful microorganisms. Therefore, it is evident that although there was some use of chlorine, there was not enough to be effective.

In the next Section, I present the results of my water analysis tests in Cayes-Jacmel. The results of these tests are meant to serve as a validation of the data sets presented in the previous chapters. Therefore, I do not dwell on the results, however I do use them as a backdrop for understanding the health of the local environments and water systems that I am studying.

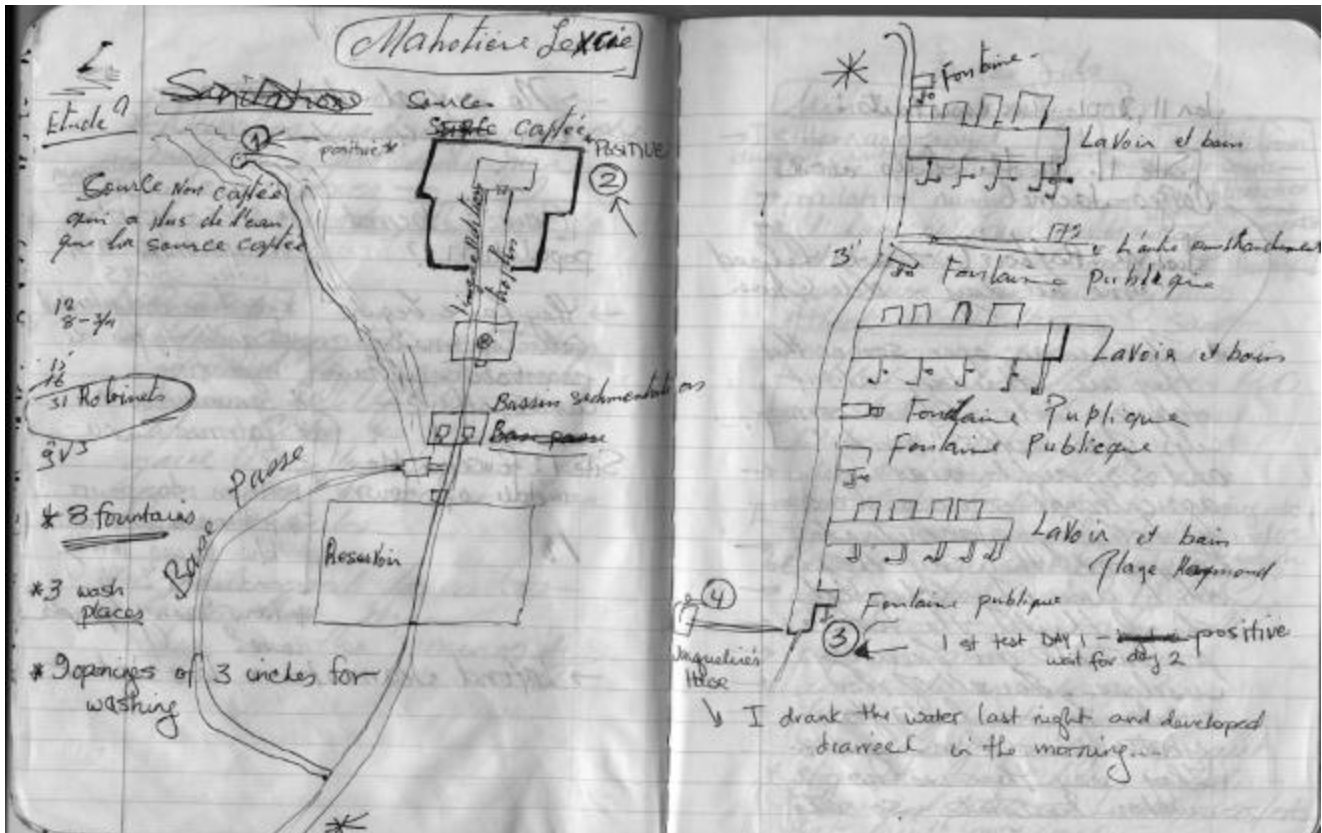
Figure 5.3 Examples of Cayes-Jacmel Washing Area and Traditional Robinet (Left to Right)



SITE DATA: Water Sample Collection

There were two water sources located in this area in the hills above Cayes-Jacmel, one already established and covered, another a potential source that had recently been discovered. The distance from town was approximately a 45-minute hike through dense vegetation (the majority banana trees of some variation). I was accompanied by Lissage-Raphael as a guide.²³ The first site was a potential new source that the community was thinking of using and the second site was one of the main sources, Source Mahotiére Lexcie, for the town of Cayes-Jacmel.

Figure 5.4 Map of Mahotiére Lexcie Source and Site drawn by Ernès Fils, Cayes-Jacmel



Note: Circled numbers in map indicate corresponding site location.

²³ Throughout my travels in Haiti, I was always given a guide or local to accompany me. I think this was both a way to ease people's curiosity about my presence in their area, to have someone with me at all times who understood local customs and language (although most could understand French), and to ensure a certain level of comfort and safety on my part.

Site 1: Potential New Source for Capture

This is an open source that they are thinking about tapping into. It is coming up from a segment in what appears to be a small creek right next to land that is worked by a farmer growing what appear to be banana trees of differing varieties (See Figure 5.4 for location). However, in both Cayes-Jacmel and Ray mon (the neighboring province) they say that there are no chemicals of any sort used for the production of crops. Additionally, when questioned about fertilizers, natural or otherwise used for crop production, local farmers said that they don't use any sort of fertilizers at all. All of the tests for nitrates and nitrites came up negative. Additionally, because there is no method of water treatment for these sources (no boiling, chlorine, iodine, or filtration), the chlorine tests are not applicable to these sources either. The Pathoscreen for this source was positive, which indicates the presence of hydrogen-sulfide producing bacteria. After one day of incubation there was a small amount of black precipitate on the bottom of the test tube. The presence of black precipitate indicates that this water source is contaminated with bacteria present in fecal material. I did not run a chlorine test for this site in that it is untreated. Additionally, both the nitrate and the nitrite tests were negative.

Source Mahotièrè Lexcie

Site 2: At the Source

The water collection is covered, but takes in rain as well as the water coming from the ground source. All water appears to be clear, without excessive floating debris and there are no noticeable odors to the water. There are no treatment methods at this source, which is the capture source feeding to eight fountains, three 'showering' areas, and nine openings for washing of dishes and clothing (see Figure 5.4). According to locals, there are many cases of malaria in the area, although it is apparently

reduced from earlier years,²⁴ and cholera is very common in the area, which is contracted from drinking contaminated water. The Pathoscreen Test for the Mahotiére Lexcie Source was positive for hydrogen-sulfide producing bacteria. After one day of settling, the solution of sample water and Pathoscreen powder turned completely black, indicating contamination of the water source²⁵. Chlorine testing was negative, which is not surprising in that the water is untreated. Nitrate/Nitrite tests showed no signs of contamination in the area even though the source is surrounded by agricultural land. This supports local claims of the absence of fertilizers and other agrochemicals.

Site 3: Main Faucet in Town

Site three is the main faucet or ‘robinet’ in Cayes-Jacmel proper and comes from the Site 2 source of Mahotiére Lexcie (see figure 5.4). The faucet was used as a drinking water source as well as a place for washing. Because the main source was contaminated and there are no treatment processes present along the water pathway, it was assumed that there would be contamination of this site as well. Furthermore, the positive results of these sites help to validate the results of the main water source tests. This faucet was located next to the paved road and in the center of town. There were not many signs of vegetation or animals directly near the site. Additionally, there were no latrines near the faucet. The Pathoscreen for this site was positive. After approximately 30 hours, black substrate was present in the sample (The test requires 48 hours before concluding ‘negative’ results.) Chlorine tests were not applicable for this site. There were no indications of Nitrate/Nitrite contamination.

Site 4: Jacqueline’s House

This site was located behind Jacqueline’s house--the house in which I stayed during my time in Cayes-Jacmel. As mentioned previously she lives in the middle of town, perhaps a block from Site 3

²⁴ This might be due to the time of year, in that it’s not the rainy season, or due to the overall precipitation for the year.

²⁵ Ideally, I would have liked to repeat the procedure using the MPN technique (most probable number) to estimate the concentration of bacteria present, but did not have enough sterile equipment to do this.

(see Figure 5.4 for details). Her faucet is located approximately ten feet from a latrine²⁶ and the PVC pipes that ran to the source were suspended in the air. After one day, the Pathoscreen tests were positive. Both Chlorine and Nitrate/Nitrite tests were not applicable for this site. The water at Jacqueline's house is also fed by the main source of Mahotiére Lexcie, which further validates the initial results. **NOTE:** Before testing the water at Jacqueline's house, for some reason I decided it was okay to have a glass of water in the evening. The next morning I started feeling ill and had diarrhea coupled with intestinal discomfort, indicating the presence of bacteria or pathogens in the water source.

Source Ray mon, “Ravine Normande”

The Sites from Source Ray mon are located between Cayes-Jacmel and Jacmel and, according to the local mayor, are under the same governmental municipality. We visited the main water source, Source Ray mon—approximately a one-hour hike from the main road—however, the reservoir was too large to obtain a sample. There was another source that was uncovered and located in a streambed, which apparently serves as a source for water for people in the area. The third site were the main faucets and wash basins in the center of Ray mon, which were used as both water sources and for doing washing of all sorts.

Site 5: Open Source in Hills

This site was an open water source in the hills above Ray mon. The area was surrounded by varied vegetation and was located in the middle of a small streambed. The results of the Pathoscreen were positive. The sample became completely black and cloudy within 24 hours. Both Chlorine and Nitrate/Nitrite were not applicable.

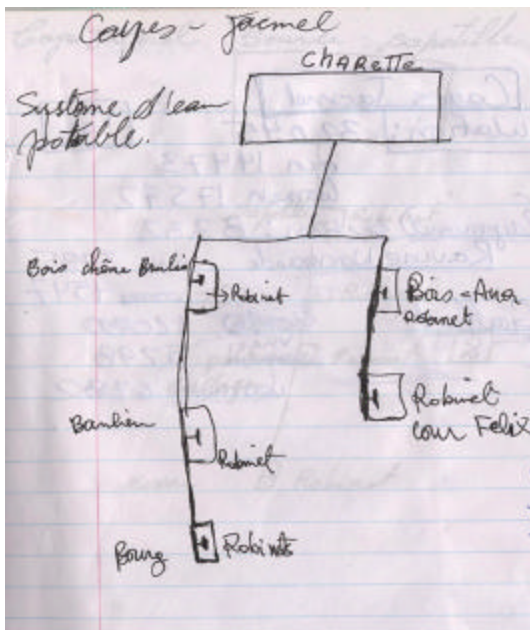
²⁶ The latrines were were much like outhouses, covered and with a handmade stone stool to sit on over a pit. There was no plumbing in the area.

Site 6: Main Faucet in Ray mon

This site was covered with a cement rain shield and consisted of three faucets and washbasins. As I took samples, it was being actively used to fill water containers and for laundry.²⁷ There was a side faucet on the small structure being used for bathing. The Pathoscreen test became a cloudy gray after two days, resulting in a positive reading. Both Chlorine and Nitrate/Nitrate were not applicable. **Note:** Both of these samples appeared to have a soapy film on the tops of them. Sterile test tubes were used, however, it may have been the Pathoscreen powder.

Source Charette

Figure 5.5 Map of Source Charette and the Robinet Cour Felix



Site 7: Robinet Cour Felix

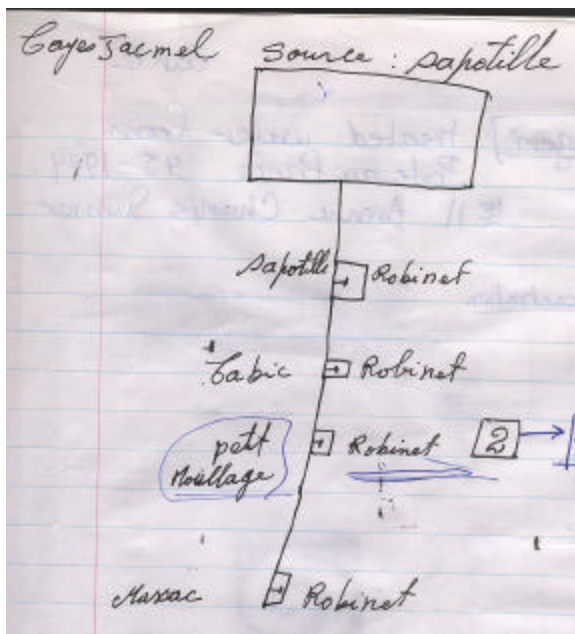
The main source, Charette, for this area of Cayes-Jacmel was apparently a four-hour hike and we were not able to visit it for testing. However, I was able to procure a layout of the faucets

²⁷ However, the majority of laundry appeared to be done in the rivers in both the Cayes-Jacmel area, Fondwa and Bèl Fontèn.

stemming from the Charette water source (see Figure 5.5). The Robinet Cour Felix was a simple design for the water faucets, similar to all of the designs encountered in the areas where I did my research. The faucet was dripping continuously and appeared to have been neglected for some time. Children were in the area collecting water in buckets and were curious of my presence in the area. The Pathoscreen Test was positive for this site. I attempted to do the MPN (Most Probable Number) test for this sample, which indicates the concentration of contamination of the sample, but I do not think that I did the dilution properly because all of the tubes turned black. I did not perform any other tests on this site.

Source Sapotille

Figure 5.6 Map of Source Sapotille and Robinet Petit Moullage



Site 8: Robinet Petit Moullage

This faucet was in the front 'yard' of a local home, which was located right next to the paved road. Agricultural land was not directly next to the source (See Figure 5.6). The Pathoscreen test for this site was positive. I did not perform any other tests on this site.

Culligen Drinking Water Results

Culligen drinking water is sold throughout Haiti in both small plastic bags and in bottles. The water is processed and treated in Porte Au Prince, Avenue Charles Sumner No. 11. Tests were performed on this water to be used as a comparison for chlorine levels with other treated drinking water. The Pathoscreen tests for Culligen were negative. The Chlorine content of the water sample was 0.2 (I need to read the colorimeter for conversion into concentration levels and compare this to the recommended EPA standards for chlorinated water.) There was no Nitrate/Nitrite in the sample.

Site Data: Soil Tests in Cayes-Jacmel

Site 9: Banana Trees in the Hills

This sample was taken near banana trees in the heavily forested area of Cayes-Jacmel. The color of the soil was a darker brown black color and was sandier than the clay soil of the Fondwa region. The results of the soil analysis are as follows:

Potassium: High

Phosphorous: Medium

Nitrogen: Low, however not very low such as the samples taken in

Site 10: Jacqueline's House by the Shore

This site was located right near the houses of Cayes-Jacmel and approximately 4 meters from the ocean. The results of the soil analysis are as follows:

Potassium: High

Phosphorus: High

Nitrogen: Very Low, dark yellow

It is evident that the statistical data concerning water and soil quality in Haiti were applicable an accurate in relation to my results from the Cayes-Jacmel region. Regardless of their location, all water samples, both from the sources and from the various collection areas, came up with 'positive' Pathoscreen results. This indicates that all of these water sources were contaminated with fecal matter. These results are not surprising due to the structural integrity of the systems. As mentioned before leaking PVC tubes, open-floored water captures, the lack of filtration or purification methods, and the lack of waste-management techniques results in the contamination of water sources. Because

the water sources themselves were positive for contamination, I believe that much of the contamination of water sources in Cayes-Jacmel is stemming from the poor construction of water captures.

Although I was neither prepared, nor qualified to give an in depth analysis of the local environmental issues, I felt that the presentation I was asked to make to the workshop members in Cayes-Jacmel was both helpful and well taken. According to other members of the CDRH training workshop, immediately after my presentation those present at the workshop had already begun planning preventative action they could take to restore water quality in their area. For these reasons alone, I feel that my time spent in Cayes-Jacmel was very beneficial. Upon my arrival back home, I have written to some of my friends in Cayes-Jacmel with information answering questions that I did not have the answer to when I was in the field.

In this Section, I have gone over my field results in Cayes-Jacmel. In the next Section, I outline some of the work I did with CDRH and their program objectives.

CDRH Disaster Prevention Workshop

Through the Haitian discussion group, Corbett list, I was lucky enough to meet Jean-Sébastien Roy, the Director of the Haitian Center for Development and Human Resources (CDRH). CDRH is headquartered in Delmas, Port au Prince, and is concerned with various ‘developmental’ issues across the country. During my stay in Haiti, I not only stayed with Sébastien and his family in Port au Prince, but I also worked closely with him and a CDRH Training Group in Cayes-Jacmel, a rural town approximately five miles to the East of Jacmel—by my estimation--on the Southern Coast of Haiti. According to Roy, his organization recently received funding from the USAID Hurricane Georges Disaster Prevention Fund. Accordingly, Roy and his colleagues have been traveling throughout Haiti

conducting multiple day Disaster Prevention Workshops, which both serve to educate local rural populations on how to best organize, communicate and prepare in the event of a natural disaster's approach and draw international attention to concerns of remote rural Haitian villages. During my visit, David Crisp from the Florida Emergency Disaster Relief Program was also visiting CDRH, having been sent as an 'expert' to aid in the Cayes-Jacmel CDRH Disaster Prevention Project.

During a meeting with David and Sébastien, we discussed the objectives and structural makeup of the CDRH Program. According to Sébastien, due to recent funding provided by USAID and PADF²⁸, it is obligatory for the communities chosen to be involved in CDRH projects to provide documentation, maps and outlines of progress and approaches in their region. Ideally, the maps indicate the level of vulnerability of the community to natural disasters, and written reports outline the extent of community efforts and the success of the overall Project. According to Roy, funding is dependent upon the expectation that rural Haitians must accurately represent the topography and demographics of their area, must be able to clearly construct a risk-analysis assessment of their local community, and must be able to maintain and update these records throughout the length of the project. Unfortunately, in a country with nearly a 70% illiteracy rate, these mandates are not realistic expectations for the rural Haitian communities. To me this shows that PADF and USAID do not appear to be sensitive to the realities of the Haitian communities in which they are working.

As a result of the importance of literacy in the preparations for the CDRH Disaster Prevention Workshops, those members of the community chosen to participate in the workshops are likely to be literate. According to Roy, the local community usually selects workshop participants who are often chosen because of their community leadership skills. The group that I joined in Cayes-Jacmel was composed of approximately twenty representatives from surrounding communities. Within the group

there was a distinctive minority of women, approximately four, which might be indicative of the status or the availability of women in the region. During my conversations with Sébastien, he emphasized the importance of targeting women in these leadership groups, which was evident during the workshop I witnessed. He was careful to directly speak to the women at the meeting and remarked repeatedly on the disproportionate representation. Accordingly, he appealed to the significance of the role of women in the community openly and called for acknowledgement of the immense responsibility placed on women within the community: taking control of the families, children, the home and the markets as well. In Cayes-Jacmel, those at the meetings were all well dressed and prepared for the presentation. The majority of men wore suits or nice pants and women wore dresses or “nice” clothing. Additionally, the majority of representatives had notebooks and paper for taking notes²⁹ in addition to the maps they had constructed of their areas, which varied greatly in both detail and accuracy.³⁰ Not only the actual Training Workshop provides assistance to local communities. The processes involved in choosing representative leadership from the community are also fundamental to the efficacy of

²⁸ Pan American Development Fund, which is currently funding intensive road restructuring, repair, as well as water collection and flood prevention projects throughout Haiti. I witnessed projects run by PADF in Cayes-Jacmel, Fondwa, and Bèl Fonten.

²⁹ The presence of note taking is a significant indication of the process of choosing representation for these workshops, and indicative of attributes associated with ‘leadership’ positions. The vast majority, if not all, of the representatives at the workshops showed relatively high levels of literacy. In a country where illiteracy is rampant, the ability to read and write is a powerful tool towards local power and respect. Additionally, the ratio of men to women in the group may also be indicative of the criteria associated with leadership roles and abilities. However, this may also be reflected in the labor situation in the rural areas, and the roles of men and women therein. Additionally, there is the relevance of labor excess, particularly in respect to ‘male’ labor. The ages represented in these leadership groups seemed to range from mid to late twenties to mid fifties with few older than fifty. However the majority of those present were probably in their late thirties.

³⁰ The majority of these maps included the number of houses in the area, rivers or creeks in the area, some of the trees and other things that would be considered community landmarks, such as schools, churches, particular family houses, etc. Sébastien explained to me that the creation of these maps is not only fundamental to the funding regulations set by USAID, but is also crucial to the actual communities. For the majority of rural areas in Haiti, there are no official governmental records of where people live and how many people there are. I was surprised to find in Cayes-Jacmel, a fairly recent (1996) census of the surrounding areas. However, the accuracy of these numbers is disputable. Due to the lack of demographic records it is very difficult, if not impossible for large-scale governmental programs to be effective in that they don’t know the resources (human or natural/material) that are available to them. Additionally, many of the rural villages are not even acknowledged by the government, and therefore don’t exist in their eyes. This was even more relevant during the Duvalier period and before where rural areas were completely isolated from the urban centers.

structural change within a community. The entire workshop revolves around the process of allotting specific roles and responsibilities to individuals. This is done to create networks of communication and to organize communities so that they are more adept at dealing with problematic or changing situations—in the case of the workshop the problems at hand would be approaching natural disasters. Additionally, the ‘grassroots’ organization of the workshop format aids in efforts of decentralization of power through a ‘union of the masses’. Through educational training, organization and documentation, a community’s participation in one of the CDRH Disaster Prevention Programs leads to increased credibility for the community, potential for increased local commerce and investment from outsiders. According to Roy, often when a community shows active involvement not only within their existing community but also in instigating change within the community this serves as an impressive sign of ‘advancement’. This sign of ‘advancement’ from the ‘rural peasant state’ is, unfortunately one of the keys to external financial investment.³¹

According to the program outline of CDRH, as a result of the Training Workshop community groups are provided with models of program efficacy and approaches, assistance in local need assessment, and have highlighted corresponding internal regulations preexisting within their own community. As I have noted in previous chapters, these structural, local hierarchies play key roles in resource allocation and control, particularly in the case of water sources. Within the plan assessment, it is important to determine the resources that are readily available to the community and what the building standards are. Accordingly, the focus of CDRH’s approaches is to incorporate issues of

³¹ As I have discussed aspects and differing concepts of development, I’m not certain if this is a positive attitude to be integrated into local communities. Within the concept of advancement are coupled ideas of increased materialism, Westernization, and international markets, not necessarily beneficial to the smaller, peasant communities. This issue is one of intense, increasing complexity within the ‘age of globalization’. However, I believe it not merely an issue of semantics. The concepts associated with ‘development’ are key to understanding social stereotypes and stigmas associated with developing and developed countries.

collective action, participation, rules and statures of rapport for the future into the rural Haitian community structure.

Chapter 6: Fieldwork and Results in Fondwa, A Mountain Village



Figure 6.1 Photo of Main Road, Fondwa

Description of the Region

Fondwa is a mountainous region in the hills between Jacmel and Léogane, approximately a three-hour drive to the Southwest of Port au Prince. The extent of deforestation in Fondwa is immense. While I was walking with one of the teachers from the local school, he pointed out to me a peasant that was in the midst of cutting a tree down—off in the horizon. What really struck me was that it was actually possible to see this one lonely tree disappearing from the sienna colored landscape. As is apparent in the photo at the beginning of this chapter, most of the hillsides of Fondwa are bare of any type of vegetation. When I say this, I am not merely talking about tree coverage—In many areas there is no grass and there aren't any weeds to hold the soil on the steep slopes of the mountainous terrain. The levels of soil erosion and the lack of essential nutrients in the soil further emphasized the disruption of nutrient cycling due to intensive agriculture and overall land use.

The APF Community Center was not only where I stayed, but was also the center for local meetings and instructional activities as well as the headquarters for the Peasant³² Association of Fondwa (APF). My interactions with APF began with an email concerning some of my questions concerning water quality issues in Fondwa and their organization. I had had a friend who spent over a month in the vast mountains of Fondwa through a cooperative program between Global Exchange and APF. She recommended that I contact Father Joseph, the Head and Founder of APF, to see if I might find some way to work in Haiti. After many emails explaining my project and my reasons for wanting to come to Haiti, Father Joseph generously offered that I come to his home village, Fondwa, and stay at the community center for five days, free of charge. My experience in Fondwa was not only very informative, but it was a place of great sharing and community. In this Chapter, I would like to discuss some of the soil samples I took in Fondwa, but most of this Chapter is devoted to describing 'grassroots initiatives' I observed and participated in during my stay in Fondwa. These initiatives include: A cooperative agricultural reform project between local farmers and visiting Cuban agronomists as well as educational meetings set up to increase dialogue between groupmen³³ throughout the dispersed community.

Youth and Migration

According to the WRI statistics, the majority of the Haitian population is under 15 years of

³² Throughout my paper, I have avoided using the word 'peasant' due to negative connotations with this word in our society. However, 'peasant' is the direct translation of the French word 'paysan', which is used throughout Haiti to describe rural communities. To avoid the many connotations associated with 'peasantry', I would like use the definition of Mintz, reiterated by Richman: "A peasantry can be defines as 'rural landholders who produce both subsistence and commodified for sale, who are part of a larger social system, and upon whom others of great power exercise an exaction of productivity in one or another form". (Richman: 43). Although this does relate directly to the peasant farmer of Haiti, there is also a strong sense of separation from the power of the state in rural areas. Landholdings are small, indicative of both a kinship-based system of land tenure and the increasing population of the small island.

³³ 'Groupmen', as it was explained to me, is the name given to members of a 'group' of farmers that tend to work together to discuss local issues and to deal with problems of agriculture or community affairs.

age. This is indicative of both the actuality in Haiti and of the labor force in Haiti. There is an overwhelming surplus of labor in this predominantly rural country. Over 70% of Haitians are agriculturalists and Haiti has next to no industry. Consequently, there is a very competitive job market for low-wage labor. In rural Haiti, the spatial component of population distribution is quite low. Excluding the capital Port au Prince, which maintains nearly a third of the entire Haitian population, population distribution is disbursed throughout the Haitian landscape.

Although mass migration from Fondwa to Port au Prince and Cap Haitien continues, there are now some programs such as the one in Fondwa, which are urging young members of the community to become involved in local development. These programs also are teaching them of the hardships and dangers of the cities. While meeting with a group of 'twenty something' adults in the rural region of Fondwa, we talked of many issues concerning their daily life. To them, it is important to educate other young people in their area as to the hardships of urban life in comparison to rural life in their community of Fondwa. They have apparently learned that at least by staying in rural areas they are assured food, family and friends for support. This reality is contrary to many stories of rural youth migrating to Haitian cities, such as Port au Prince. There housing is virtually nonexistent and there exists little support for the poor. Additionally, the great strength of kinship support that exists for these youth in rural communities is virtually nonexistent in the city. The spatial separations between families and youth, coupled with poor communication technology and the proportionately high cost of transportation, are difficult to overcome.

When talking about aspirations, the Fondwa Youth Group spoke of continuing their educations, but in reality it was evident to both them and me that their options are very limited. Some had dreams of being doctors and nurses, but many had aspirations for more vocational work such as masonry, carpentry (difficult in an area where there is complete deforestation), cooking, and sewing

indicating a need for vocational training and schooling in rural areas. Surprisingly enough, as I am sure that the majority of their parents are agriculturalists, not one of the young people showed any interest in farming. Whether this position holds some sort of social or generational stigmatism, I don't know.

The Cubans of Fondwa

On January 14th and 15th of 2001, I participated in discussion groups with the Cubans in residence in Fondwa, Roberto and Simon. I was also fortunate in that their supervisors from Cuba overlapped with my stay in Fondwa. The Cuban workers were all from the 'Instituto de Investigaciones Horticolas "Liliana Dimitrova", La Habana, Cuba. Marissa Chailloux Laffrita specializes in Tropical Soil Analysis, Adrisi Hernandez Chavez specializes in Agroforestry, and Dr. Roberto Caballero Grande is the Chief of Projects, Rural Development. The two Cubans in residence were Roberto, who also specializes in Agroforestry and who is a former Professor, and Simon, who is a Livestock Veterinarian. At the time of my visit, Roberto and Simon had been there for two years; however, Roberto was being called back to Cuba, hopefully temporarily, for some complications with his papers.

During my stay in Fondwa, I was able to tour Model Farms set up by Fondwa farmers in cooperation with the Cubans, participate in discussions and presentations concerning the methodology and psychology behind the developmental approaches of the Cubans in Haiti, observe the relations between Cubans and Haitians, and be party to recommendations from local groupmen³⁴ and residents of Fondwa. In this Section, I outline the approaches to development issues that were practiced, emphasized and reinforced by the visiting Cubans. Furthermore, I relate these concepts of

environmental preservation, restoration, and cultural adaptation to some of my other experiences of developmental aid and program applications, which I witnessed during my stay in Haiti. Through this comparison of both local and International Development Aid Programs, I hope to both offer and invite criticism.

According to Dr. Roberto Caballero Grande, Chief of Projects of Rural Development, Instituto de Investigaciones Hortícolas, Cuba, of the near ten million people of Cuba, one million of them are Haitian or of Haitian descent. This linkage of cultural heritage is one of the key driving forces behind the increasing exchanges between Haiti and Cuba. Additionally, the consistent influxes of Haitian refugees on the shores of Cuba provide additional initiative for the Cuban government to support “development” efforts in Haiti. The aid being provided through the Instituto de Investigaciones Hortícolas in Fondwa is indicative of approaches to rural development, environmental restoration, and local “sustainable” practices.³⁵

Haiti and Cuba share many of the same ecological positioning in that they are both island systems within the tropical climate of the Caribbean. However, Cuba has is unique in that they have been both economically and politically isolated from the world due to embargoes and isolationist methods of the United States government. At the same time, Haiti has been subject to various forms of economic and political isolation. As the first ‘Black Republic’, Haiti was not only forced to pay royalties to the French government long after independence, she was not acknowledged for decades

³⁴ Groupmen are peasant groups that are created for both decision making reasons and for organizational meetings. I will attempt to explore the importance of the groupmen structure later in the paper when discussing empowerment and solidarity within the context of social change.

³⁵ The issues of “sustainability” in both development and the environmental sciences is both touchy and controversial. I think that the main issue is that the definition of sustainability is quite vague in both its meaning and in its possible applications. Therefore, on a scientific level, it is nearly impossible to know what the classification of something as “sustainable” is truly indicating. Deliberations over this issue could fill an entire dissertation, so I will not provide in depth analysis of sustainability in this paper. However, I would like to present some of the issues that the Cuban workers as well as other developmental programs attributed to their own concept of “sustainability” within a community and within their specified projects.

after her independence by the majority of Western nations, including the U.S. This initial economic and political isolation has been mirrored today through repeated U.S. embargoes and conditional aid from both U.S. and international aid programs that have been coupled with political preferences.

The installation of the current program in Fondwa is a collaborative effort headed by the Cuban Ministry of Agriculture³⁶ and willing Haitian organizations. It was not made clear as to the extent of Haitian governmental involvement in either the Fondwa program or the overarching larger cooperation between the countries. However, due to the nature of the APF programs I suspect that involvement of the national government is minimal at best. In Fondwa, the program itself is part of a ten-year development initiative. Although there is a limited time frame attributed to the Cubans direct involvement in the project, it was made clear through discussion with the Cubans in Fondwa and the visiting superiors that the expectations extend long beyond the ten-year time commitment. According to the goals outlined in the discussion of the terms and expectations of the project at the APF community center, the theories behind the Cuban project are those encompassing empowerment, local solutions to local problems, “sustainability”, and the exchange of knowledge as both a tool and an optional application.

Within the Cuban/Fondwa initiative there are certain assumptions being made including assumptions of the local economy, environment and social structure. According to World Resources Indicators, there remains only one percent of the original forest coverage in Haiti. This means that there is 99% deforestation in the small island of an approximately 8 million Haitians. Therefore, the vastness of deforestation in Haiti is an indicator of the condition of most local soils. In Fondwa, the soil is in very bad condition due to extensive farming and grazing, coupled with massive erosion³⁷

³⁶ According to the resident Cubans in Fondwa, the Ministry of Agriculture deals with a broad variety of environmental issues including agroforestry, forestry, watershed management, and pig and chicken production.

³⁷ For further information on the quality of the soil and my own analysis in the Fondwa region, see the section for ‘Field Research Results, soil analysis’.

from lack of root structures for holding topsoil in place. Therefore, according to Dr. Grande, the soil in Fondwa is only good for some species of pioneer trees including Eucalyptus and Peanut varieties. Although the main focus of the Cuban/Fondwa initiative is not reforestation and is more focused on agricultural methodology, it is impossible to ignore the consequent conditions of deforestation in Fondwa. Accordingly, the Program has included suggestions and ideas on how to initiate reforestation methods into local farming techniques and into education concerning the ecological makeup of Fondwa. In order to do this, the program is attempting to emphasize the link between economic development and improved environmental conditions. Grande emphasized in a presentation to the staff of APF how the production of trees in Fondwa could prove to be a very lucrative business for local farmers. According to him, if Fondwa peasants were able to produce a regenerative supply of wood, then they would have isolated the market of Haitian wood supply and could get good prices for their products, while encouraging other localities to engage in reforestation initiatives³⁸ and soil conservation techniques.

One of the harshest criticisms I hold for the majority of development programs is the existence of strict quotas and rapid change turnover expectancies. The Cuban program in Fondwa is deliberately a slow, long-term approach to development that is initiated with the sharing and *demonstration* of agricultural and environmental knowledge from the Cuban professionals coupled with a sense of individual empowerment and choice. The program goal is not for the visitors to be doing or implicating “development” it is for the local farmers and ‘peasants’ to choose from the information and education provided by the Cubans and to use this information to develop their own community as they see fit. In this way, the Fondwa project is in the hands of the people it is affecting, rather than foreign institutions. The Cubans emphasized the importance of not giving donations to locals in that the initiative itself is a program that will help them. Accordingly, all of the methods used are ones that

³⁸ For further information on wood as a cash crop in Haiti, see Murray studies as cited in references.

work within the available resources of the peasants. There is no additional machinery, fertilizer, etc used to implement the changes, only optional changes in methodology. With this approach, they hope to develop a sense of “self-help” and confidence within the peasants. To the Cubans, this is the key to long-lasting changes in both actions and philosophy.

In this Section I have discussed the Cuban/Fondwa relationship. I have looked at both some of the practices and the philosophies behind this cooperation working towards environmental restoration and a greater way of life in Fondwa. In the next Section I outline my results and observations concerning soil quality in Fondwa.

Soil Analysis Fondwa

In this section I present the soil analysis data that I obtained from my research in Fondwa. Unfortunately, I was not able to obtain water samples from the sources in Fondwa due to problems with my sampling equipment in the field. Upon my arrival in Fondwa, I encountered a problem with my testing equipment in that I ran out of sterile test tubes for sampling water. However, I assumed that I would be able to sterilize the tubes by boiling them. After boiling the tubes for fifteen minutes, there was still visible residue inside of the containers, which made me fear invalid results. Therefore, I must discount the Pathoscreen tests in Fondwa and have not included them in this paper. I was able to test the chlorine content of the water at the APF community center due to the fact that the containers for this sampling did not require sterilization. According to my results, the APF water had the same concentration of chlorine as the Culligen water, which is sold as purified bottled water throughout Haiti. This indicated to me that the water at the community center contained enough chlorine for purification standards. Additionally, the fact that I drank this water throughout my stay in Fondwa and had no adverse reactions supports this conclusion. Another contributor to the potability of water at the

Center may have been that the majority of the water was collected from rainwater and stored in a vat on the roof, instead of by the traditional methods of surface water extraction.

Site 1: APF Community Center Plot³⁹

This site is located uphill from the APF community center. The majority of the areas around Fondwa are extremely barren and deforested. The soil here had very little ground covering of any type and no fertilizer or other organic material has been applied to the site. The results of soil analysis are as follows:

Potassium: High, very cloudy

Phosphorous: High, very dark blue

Nitrogen: very low, the color change peaked with a very light orange.

Site 2: Banana Plantation

This site was located on Minik's land, a local farmer and participant in the Cuban/Fondwa Initiative, which had been intensively farmed for bananas among other crops. The farm is one of the model farms incorporated in the APF Program.⁴⁰ This site is located in a valley where there is moderately heavy tree coverage and a very humid atmosphere. The soil has a darker coloring, not as red as the more exposed soil at the APF Community Center. The results of the soil analysis tests are as follows:

Potassium: high

Phosphorous: medium

Nitrogen: Very Low. The results of the nitrogen remained below the scale.

³⁹ This plot of land was currently planted with beans plants.

The above soil samples reemphasized my hypothesis concerning the adverse affects of erosion on the nutrient content of local soils. All of the soil samples I took in Fondwa showed that there were very low levels of nitrogen in the region, which is one of the most fundamentally important nutrients for the growth of most plants. Additionally, many of the tests showed that the phosphorous and potassium levels of the soils were low. These results indicate to me that the levels of erosion are high enough to cause the depletion of the majority of the landscapes topsoil—the section containing most essential nutrients for plant growth.

In this Chapter and the previous one I focused on qualitative environmental results from my fieldwork in Haiti. These two Chapters represent the ‘biological perspective’ of the regions of Cayes-Jacmel and Fondwa. In the following Chapter, I expand beyond data collection and delve into the intricacies of spirituality and metaphor in relation to the natural Haitian environment. As a result, I hope to present a very different perspective of the Haitian environment and the roles of the Haitian within the landscape.

⁴⁰ I explain the model farming techniques in the section allotted to Fondwa development approaches and the Cuba/Haiti relationship.

Chapter 7. Natural Symbols: Water and Trees in Haitian Voodoo and Metaphor

There is the ocean. There is the island. On the coast of the island, memory is not new; it is not young either. Most parcels of land, considered as a magic earth, are where the manes of ancestors, the figures of heroes of the independence, mysteries, spirits and gods hide. Mountains and valleys, rivers or estuaries, water sources and lakes, routes and paths, are inhabited by memory. Without her, there is not knowledge or growth. This country is nothing but a large tree, a Mapou, who often says in a sentient tone; one day, she will run away, will reunite with the ocean, and head towards the expansive waters-- her wood, floating and rolling, ravished by the salt, she will take her definitive form and prepare for death (Ollivier: 18, My translation).⁴¹

In this Chapter, I further emphasize the need for a greater understanding of Haitian culture, symbolism and ritual. These perspectives are fundamental to understanding how Haitians view their natural environment and to understanding how these local perspectives have affected and continue to affect the treatment of the natural environment. When Laura Rival writes of the relevance of natural symbolism in better understanding human/nature interactions, she writes of the importance of metaphor as an indicator of social structure and the division of the biological world.

Natural symbols are not just projections or metaphors of social life. So, rather than looking for the correspondence of a particular social structure and a unique way of dividing up the continuous and undifferentiated biological world, she [Mary Douglas] now suggests that we identify the theories that sustain the classification of animals and humans, and give meaning to the metaphors. (Rival: 4).

⁴¹ Il y a la mer, il y a l'île. Du côté de l'île, la mémoire n'est pas neuve; elle n'est même plus très jeune. La moindre parcelle de terre peut être considérée comme une terre magique où se sont réfugiés manes des ancêtres, figures des héros de l'indépendance, mystères, lwas et dieux de sand. Montagnes et mornes, rivières ou estuaries, sources et lacs, routes ou sentiers, sont habités par la mémoire. Sans elle, pas de connaissance en profondeur... Ce pays n'est qu'un grand arbre, un mapou, disait-il souvent d'un ton sentencieux; Un jour prochain, Il s'effondrera, rejoindra la mer, s'en ira vers des eaux profondes où son bois, flotte, roule, ravine par le sel, prendra sa forme définitive de barque pour la mort. (Ollivier: 18).

Following, I have chosen some key symbolic representations of environmental consciousness present in Haitian Voodoo and metaphor both of which are reflective of important aspects of Haitian culture. I am not proposing that these are the only examples of these interactions and perspectives, however these are potent symbols of the ties between local ecology, social process and land use. I also discuss the process of 'identification' or symbolic association between Haitians, the land of Haiti and the 'natural environment'.

Agriculture and Ritual

In many places throughout the world, agriculture serves as a means for production and subsistence as well as an integral part of spiritual and ritual systems. Thus, interactions with the land associated with agriculture are closely tied to many rituals. Stephen Lansing, an anthropologist who studied the complex water temple systems in Bali in depth emphasizes that the importance of the presence of ritual in local agricultures must not be overlooked.

Precise observation of the affairs of daily life persuaded Condominas that agricultural work is not merely a sequence of technical tasks; it is a meaningful series of interactions between social groups and the natural world. The field rituals that accompany each stage of agricultural labor form a kind of commentary on the productive process. Moreover, the rituals of work in the fields may be 'performative', in that they call forth particular social groups to engage in activities such as planting or harvesting. Agriculture, in short, is a social as well as a technical process, which is structured by the sequence of agricultural rites... To the extent that the agricultural cycle of rites becomes the abstract calendar of social life; the analysis of one is equivalent to the analysis of the other. (Lansing: 6).

Here, Lansing stresses that the farmer not only maintains a direct relationship with the land through labor and the extraction of nutrients, but also that his interactions with the land create dialogues of the greater collective processes involved and of the local culture. It follows that correlations between spirituality, ritual and natural systems are fundamental to understanding how

local people view their landscape and reasons behind trends in land use.

In the following Sections, I explore some uses of ‘natural symbolism’ within Haitian Voodoo and folklore. Specifically, I focus on the roles of water sources and certain tree species in Haitian symbolism, metaphor, and mysticism. Additionally, I attempt to create a base for understanding the potentially significant roles of nature in the constructs of rural Haitian life. By paying attention to natural symbolism in Haitian rural society, I am hoping to delineate a clear sense of interactions between Haitian rural peoples and their natural environments.

Symbolism and Her Power

The exclusion of symbolism, ritual and spiritualism from ecological policy or any process in the realm of ‘development’ results in a lack of local and historical perspective. Paradoxically, it is specifically these perspectives that dictate the success of these programs and policies. It is through a greater understanding of the symbolic role of interactions (social, cultural, and ecological) that one is better able to understand action and interactions reflective of this symbolism. In this Section, I explore examples of symbolism in Haitian Voodoo and reinforce the commonality and inseparability of natural landscapes and the people who inhabit them.

Haitian Voodoo serves not only as a religion of Haiti, it is also an entire system rich with symbolism and tied closely to Haitian perceptions of the environment. Historically Voodoo has served as a signifier of community, freedom, communication and strength. It presents itself through the intensity of ritual, music, art and dance and is largely practiced by rural Haitians and the urban poor. However, Voodoo does spread throughout the Haitian class structure and even spreads to upper classes that tend to identify strongly with a Euro-Haitian cultural heritage rather than the afro-Haitian

heritage. However, there is a cultural stigma placed on Voodoo as an afro-Haitian cultural trait attributed solely to the lower classes.

Alfred Metraux, a prominent French anthropologist who has studied Haitian Voodoo extensively argues that there are “domestic” and “public” forms of Voodoo. He claims that there are many different social contexts in which Voodoo may play a major role. Some of them include places such as the household, lakou, temple, parish church, cemetery, spirit kapital (spirit repositories), pilgrimage sites, and dances. It is apparent when talking to people in both rural and urban areas that the beliefs and practices of Voodoo permeate almost every aspect of daily life. In the U.S. Voodoo has been misconstrued as a form of “devil worshipping” or “black magic”. These misconceptions of Haitian spirituality and mysticism have resulted in the exclusion of the wealth of knowledge and history concerning the natural environment within Haitian Voodoo.

According to the detailed analysis of Haitian Voodoo by Metraux, spirits are present in all aspects of Haitian life and in the Haitian landscape. Souls are assigned to, or inherent in the sun, the earth, and plants because these things exert an action on nature and on humans.⁴²

Plants, in particular, are considered to have a particularly personal spiritual component that is invoked and emphasized in medicinal healing with leaves and other parts of the plants. The souls of the great Mapou, Ceiba pentendra L., spend the nights on the roads, and their monstrous forms terrorize travelers. (Metraux: 137, my translation)⁴³

In Haiti, spirits animate the things of nature. Old trees in the yard or near a spring are spiritual capital, repositories of spirits, which cannot be cut on threat of misfortune and dishonor from guardian spirits. Plants and animals in Haiti have specific names but there is a marked preference for using

⁴² According to Metraux, the notion of “spirit” is less our Western conception of soul, and more of an indicator of a movement of life, or the presence of a “spiritual component” or of sacredness.

⁴³ Les âmes des grands mapous (Ceiba pentendra L.) errent la nuit sur les routes, et leur forme monstrueuse terrorise les voyageurs. Certaines nuits de l’année, les “âmes” des “mauvaises plants” se reunissent au pied d’un arbre eant et y tiennent une sorte de sabbat pendant lequel elle discutent de crimes a perpetrer .

generic names even with reference to a creature in the garden. This is reflective of a reluctance to use personal names in public for naming has magical and political overtones. As the following quote shows, in Haiti plants may be jealous and creatures in gardens may be lost souls:

Next to the 'great soul of the earth' (ga nam te), each field is animated by a spirit who, awakens the plants and assures fertility. The soul of the earth is not immaterial. The cultivator, who in plain day works his fields, can sense her presence like a breeze on his face and can see her shadow reflected behind him. (Metraux: 137, my translation).⁴⁴

According to Metraux, Haitian mysticism serves as both an explanation of natural, inexplicable phenomena and creates careful categorizations for abstract concepts such as the division of time and natural flows. Additionally, the mystical nature of trees, the earth and water sources serve as not only anthropomorphic representations of the Haitian perspective, but also as a means of parole between nature and the rural Haitian. Therefore, the mystification of the natural world is an indicator of the incorporation of social life and environmental understanding into greater systems. In the following Section, I use examples from Voodoo symbolism and metaphor to show the historical importance and vast presence of the “natural world” in Haitian culture.

Roots and Sacred Sources

My observations suggest that Haitian spirits are archetypal personalities whose characteristics give entrée to a fuller understanding of Haitian values and the issues of human relations. (Smucker: page unknown)

It is the spirit of the rain who fortifies the spirit of the earth. She, in turn, gives to the spirits of the plants. The rivers, lagoons and sources are naturally spirits, with their anthropomorphic appearances. They are the “masters of water” who are represented with the traits of beautiful women with light skin and long hair (Metraux: 138, my translation).⁴⁵

⁴⁴ A cote de la “grande ame de la terre” (ga nam te) chaque champ est anime par un esprit qui, agissant sur les plantes, en assure la fertilite. L’ame de la terre n’est pas immaterielle. Le cultivateur qu, en plein midi, travaille son champ, peut sentir sa presence comme une brise sur son visage et voir son ombre se profiler derriere lui. (Metraux: 137)”

⁴⁵ “C’est l’ame de la pluie qui fortifie l’ame de la terre, laquelle, a son atour, agit sur celles des plantes. Les rivieres, les lagunes et les sources ont naturellement des ames, s’apparence nettement

In this Section, I investigate the Sacred Water Source and the Sacred Tree and observe ways in which metaphor in Haitian culture incorporate human /environment interactions into the everyday life of Haitian rural peoples. I also discuss the role of the ‘Sacred Tree’ in Haitian Voodoo⁴⁶ and in everyday life. Throughout these analyses, I show how Haitian representations of ‘humanized nature’ are not only useful but fundamental to the greater understanding of the man-made environment of the Haitian landscape.

In numerous cultures water is a sacred element that not only brings life to people and animals alike but also is a carrier of greater spiritual elements. For example, in Balinese society there are strict, age-old systems that synchronize hydrological and irrigation cycles linking the productivity of the land with the underlying problem of water availability. As Lansing shows, the importance of spiritual rituals and anthropomorphic qualities given to water sources is not only indicative of the traditional knowledge-based systems of ecosystem/cultural understandings and control, but are also key organizing factors which enable ordered, cyclical communication between the various levels of the social hierarchy:

Essentially, water temples establish symbolic connections between productive groups and the components of the natural landscape that they seek to control. The natural world surrounding each village is not a wilderness but an engineered landscape of rice terraces, gardens, and aqueducts created by the coordinated labor of generations of predecessors. Anthropomorphic deities evoke this residual human presence in an engineered landscape, which Marx has called a “humanized nature”. Each weir is the origin of an irrigation system, which has both physical and social components. The concept of a “deity of the weir” evokes the collective social presence at the weir, where free flowing river water becomes controlled irrigation water (Lansing: 128).

anthropomorphe. Ce sont les “maitresses de l’eau” qu’on se represente sous les traits de belles femmes a peau claire et a longue chevelure.” (Metraux: 138).

⁴⁶ Specifically, I refer to both examples from Haitian voodoo and to explications from the field of the ‘mysticism’ of certain natural resources, including specific tree species and water sources.

Consequently, ‘natural symbolism’⁴⁷ results in a greater level of organization and communication between rural peoples. This ultimately leads to more coordinated actions relating to their environment and the allocation of resources. Balinese Water Temple Systems are primary examples of this coordination between social hierarchy, organization, and the collaborative allocation of natural resources. I will return later to the examples outlined by Lansing to both compare and contrast the topographic structures of Haitian and Balinese water systems and also to emphasize the importance of ritual in figuring a locale’s environmental perspective.

In Haiti, there are many *loa* (Gods or spirits) who live at the source of rivers in the depths of the ocean. *Loa* are also represented as “repository trees” surrounding rural habitations. One knows that a tree is a “repository” of a divinity by candles surrounding the tree and the offerings left between roots or attached to branches. (Metraux: 80). These ‘natural’ structures are thereby given significant roles in both the rituals and in the beliefs of many Haitians. In the following quote, Metraux describes his encounter with a woman possessed by a Simbi, one type of water loa:

The Simbi are also the guardians of the sources and the seas. The freshness of water is indispensable to them. I remember a woman who, “mounted” by Simbi-yan-kita, would not stop repeating “water, water”, while opening and closing her mouth like a fish out of her element, in time she threw herself fully clothed into a fountain. (Metraux: 92).⁴⁸

The reaction of the woman in Metraux’s example is indicative of both the power of possession and the intensity of spiritual ties to nature. When I visited the town of Bèl Fontèn, a remote village outside of Port au Prince, two local men defined for me some of the importance of mysticism and animistic spirituality in Haitian beliefs. They told me stories of local water

⁴⁷ I use the term ‘natural symbolism’ to denote those representations within nature which serve as key symbols within Haitian society. When referring to the ‘natural world’, I am simply talking of the ecosystem, or a biological fraction of what we call our environment.

⁴⁸ Les Simbi sont eux aussi les gardiens des sources et des mares. La fraîcheur de l’eau leur est indispensable, Je me souviens d’une femme qui, “montée” par Simbi-yan-kita, ne cessait de repeter “de l’eau, de l’eau”, puis ouvrant et fermant

sources protected by giant ‘mystical’ crabs and fish; of ‘sacred tree species’ like the Mapou, Trumpette, Almond, and Bambou where spirits come to rest and offerings are made; and of *loa* who can transform anything on land, water or sky into a mystical thing. Their stories both intrigued me and made me realize I was overlooking a very important aspect of the Haitian perspective of their native landscape.

In this Section, I have outlined some of the literature concerning sacred water sources and trees in Haitian Voodoo. In the following Section, I use the information given to me by the men from Bèl Fontèn and research the biological attributes of the so-called ‘sacred tree species’. In doing this, I hope to draw correlations between ecological roles of these trees and the sacred roles they play in Haitian mysticism.

Sacred Tree Species and their Potential Ecological Roles

A tree becomes sacred through recognition of the power that it expresses. This power may be manifested as the food, shelter, fuel, materials used to build boats, or medicine that the tree provides [...]. Sacred trees have also provided beauty, hope, comfort, and inspiration, nurturing and healing the mental, emotional, and spiritual levels of our being. They are symbols of abundance, creativity, generosity, permanence, energy and strength. (Altman 1994: 9).

As we have seen the imagery of the tree offers rich poetical resources to Caribbean writers wanting to express the crux of identity, which is developing in a double historical and cultural movement of uprootedness and rootedness. (Malena: 85).

As previously mentioned, in Haiti certain species of trees are considered sacred. These trees, often believed to serve as shelters for the spirits, are used as alters for Voodoo rituals and the calling of ancestral spirits. In this Section, in keeping with collaborative interactions between ‘biological’ and ‘anthropological’ perspectives, I have included detailed descriptions of some of those ‘sacred species’ mentioned to me by local residents of Bèl Fontèn, Haiti. I have done this to reach a better

la bouche comme un poisson hors de son element, elle allait de temps a autre se jeter tout habillee dans une fontaine. (Metraux: 92).

understanding of both the ecological positioning of these trees and to explore possible connections of the symbolic meaning of these trees with their productive relationships with the land.

The ‘sacred species’ mentioned were Mapou, Trumpette, Bamboo, Almond and Laurel/Sweet Bay. The locals of Bèl Fontèn consider these tree species sacred throughout Haiti and are unique in their inherent mystical nature. However, they also indicated that anything could become mystical through the rituals of calling spirits to an object, whether it is a tree or a rock. However, there is significance in these trees in that they represent a historical linkage between particular trees and Voodoo. I would like to explore this concept further and see if, in addition to the “spiritual” connection between Voodoo and these trees, there are underlying ecologically significant roles that these tree species play in the Haitian landscape. I am especially interested to see if these tree species have the potential to serve as “natural indicators” of water sources. Showing a tie between these two systems would indicate many important ecological and societal structuring methods in rural Haiti. Correlations between “sacred trees” and the tree’s role as an indicator species of abundant or deep-water sources would infer a deep-rooted acknowledgment and knowledge of local hydrological systems.

The spirit of all vegetation is the god Loco who is mostly associated with trees, which personify him. He gives their leaves their curing and ritual properties. Loco embodies the figure of a warrior, protector of “leaf-doctors” who never lie and whom invoke him before deciding upon any medical treatments...The cults of Loco associate with those of the trees, particularly with Mapous and Antillies Fromagers, which are among the highest essences of Haiti. The offerings made are put in sachets and attached to the branches of the sacred tree (Metraux: 85, my translation).⁴⁹

⁴⁹ “L’esprit de la vegetation est le dieu Loco qui est plus étroitement associé aux arbres dont il n’est d’ailleurs qu’une personnification. C’est lui qui donne aux feuilles leurs propriétés curatives et leurs vertus rituelles. Loco fait donc figure de dieu guerisseur, protecteur des “docteurs-feuilles” qui ne manquent jamais de l’invoquer avant d’entreprendre un traitement médical. Le culte de Loco confond avec celui des arbres, tout spécialement avec celui des mapous ou fromagers antillais qui sont les plus hautes essences d’Haiti. Les offrandes qui leur sont offertes sont déposées dans des sachets accrochés aux branches de l’arbre sacré.”

Figure 7.1 Photo of a Mapou, Bèl Fontèn



Mapou (Ceiba, Fromager, *Ceiba pentandra* L.)

The Mapou, otherwise known as the Ceiba or the silk-cotton-tree, is one of the largest tropical trees in the Americas. It reaches 5-8 feet or more in diameter and has a smooth, gray-green trunk at maturity. The root structure of the Mapou extends as much as twenty feet below the surface. It is a rapid growing, deciduous tree that becomes 80 feet or more in height. The buttresses of the branches extend over above ground root structures. Seed capsules mature in spring and summer splitting to release round black seeds and “gray wooly hairs”. The wood of the Mapou is very soft and extremely lightweight. It is easily worked and may be used as wood for boxes, carving, light construction, and canoes.

With a classification as a good honey producer and having edible leaves when cooked, the multiple-use value of the Mapou is impressive. Additionally, the hair from the seedpods, otherwise known as Kapok, is a fine, elastic fiber that serves as a good insulating material. The fiber is brittle and inflammable. Ceibas, or Mapou, as they are called in Haiti, are often found along riverbanks and open hillsides, on the coastal plain and in lower mountain regions. However, they are more common in drier areas. The Mapou is also called the 'Fromager' in Commerce, Guadeloupe, Martinique and French Guiana. (Common Trees: 332).

Trumpette (Trumpet-tree, *Cecropia peltata L.*)

The Trumpette tree is a medium-sized evergreen, which grows to a maximum of about seventy feet high and two feet in diameter. It is deciduous in areas where there is a well-pronounced dry season. The wood is light, soft weak and brittle and the main trunk is solid while the rest of the tree is comprised of hollow branches. In Puerto Rico the wood of the tree is used for the production of excelsior. These trees are abundant in open areas and in forests but not as common in dry coastal and limestone areas. The Trumpette tree is considered a weed tree and often serves as a gap closer in forest areas. Additionally, the Trumpette tree's open shade provides a good environment for the development of a new forest. (Common Trees: 66).

Bambou (Bamboo, *Bambusa Vulgaris Schrad*)

Bambou is an evergreen grass, which grows in clumps of several stems rather than that of the single stem of most tree species. Bambou grows best near streams and in moist soil. The maximum height of the Bambou is reached after approximately three months and the stems of the tree reach between thirty and fifty feet in height. Bambou is a shade provider and its massive intertwining root

structure of the plant contributes immensely to soil conservation, particularly on steeper slopes.

(Common Trees: 87).

Almandier (Almond, *Terminalia catappa* L.)

Although the Almond tree is not native to Haiti, it has been cultivated and planted for its shade and nuts. The bark, roots and green fruits contain tannin, which have been used in many tropical countries as chemicals for the tanning of leather. The trees are often planted along sandy shores because they are hardy and salt tolerant. (Common Trees:394)

Laurier (Laurel/Sweet Bay, *Laurel geo*, *Ocotea leucoxylon*)

The Laurel/Sweet Bay is characterized by its leathery leaves and is a small to medium-sized evergreen tree (fifty feet in height with a ten-inch diameter), The wood is used for small-scale carpentry and construction. In the Dominican Republic the fruits are used as a prime food source for hogs. The Laurier grows best in moist areas, moist limestone in particular, and lower mountain regions. (Common Trees: 122)

Of all of these species, the one with apparently farthest-reaching root structures (reaching depths of up to fifteen feet) is the Mapou, which is considered one of the most “sacred” species of Haiti. In the field, all Mapou’s pointed out to me were growing directly above water sources. According to the above description of species traits, the Mapou develops best along riverbanks, which indicates to me that the species may well serve as an indicator of freshwater sources. Because of their extensive root structures, they are able to grow in areas that are moderately dry at the surface but which have water sources deeper down into the ground. Therefore, I feel that the sacredness assigned

to Mapous serves as a strong symbolic gesture of the potentially important role of Mapou, among other tree species, in rural Haitian society because it is likely to also be an indicator of freshwater sources used for capture. In addition to the Mapou, all species volunteered as 'sacred species' by the locals in Bèl Fontèn grow best close to water sources such as rivers and streams. To me, this reinforces my hypothesis that the sacredness of these tree species is directly correlated with freshwater availability. If this is true, then the significance of the 'sacred species' lies not only in specific Voodoo ritual, but also indicates that symbolic 'sacredness' may be indicative of a greater Haitian environmental consciousness.

Chapter 8. Conclusion: Through the Local Eye

There is more here than meets the eye. The Haitian moral code recognizes the full range of human propensities. One person cannot trust another outside the bonds of reciprocity, which tie them together, as Haitian morality is conditional and relative, based on reciprocity. Relationships are transactional; they are subject to a give and take among human beings and between human and spirit. (Smucker: page unknown).

Actuality

As I stated in the beginning of this paper, the purpose of this project is to emphasize the need for *redefining* the multifaceted issues of water quality in Haiti through a multi-perspective, interdisciplinary approach. There is no denying that water quality in Haiti is poor. In the first few Chapters of this paper, I presented a plethora of data concerning freshwater availability and contamination in Haiti. Through my fieldwork and research, I have not only gained qualitative data concerning contamination of water sources and soil quality in the rural towns of Cayes-Jacmel and Fondwa, I have also been exposed to new, dynamic perspectives of the relationships between humans and their environment. In spite of the grim statistics resultant of a battered Haitian landscape void of trees, clean water and wildlife, there exist many available resources, human and ‘natural,’ in rural Haiti.

In Chapter 4, I argued the existence of an inherent dependency between man and the environment and disputed the common distinction of a separate ‘culture’ and ‘nature’. Through the analysis of the various flows and cycles contributing to issues of water quality, I showed how these interactions are not only codependent, but that they are mutually dynamic in the evolution of their processes and in their relationships with one another. Furthermore, I emphasized the important ties between land use and water quality for rural Haitians.

As I argued in Chapter 2, it is evident that although there is *theoretically* enough freshwater in Haiti to provide ample drinking water for the entire population, due to economic, technological and political reasons, less than half of the Haitian population has access to safe drinking water. This shows that although ecological resources are supposedly sufficient, due to societal systems and structures, raw ecological data is not indicative of the actuality of Haitian freshwater availability. Additionally, lack of sanitation and increasing erosion of the mountainsides caused by deforestation and intensive agriculture are directly and heavily affecting the *quality* of those freshwater sources available to rural Haitians.

Chapter 3 emphasized the importance of control of water resources and showed how it is fundamental to wielding power over the allocation of natural resources. Although the Haitian Ministry of the Environment (MOE) was created in 1995, there is a minimal amount of nation-wide infrastructure dealing with natural resource; The MOE produces little other than outlines of the country's major environmental concerns. As a result, rural Haitians lack financial support and lack a government-organized infrastructure that would ideally aid in locating, distributing and conserving local natural resources. However, as I have shown in Chapters 4 and 7, rural Haitians use other methods of observation and organization, such as Haitian Voodoo and the allocation of symbolically sacred trees and water sources, which allow them to exploit local water sources. These symbolically-based systems serve as niches for local knowledge and expand beyond the scientific, 'fact'-based perspective. These systems of spiritual and metaphorical knowledge are based upon years of observation and experience and are passed from generation to generation.

Spirituality and Local Knowledge

Their [the trees] gradual disappearance symbolizes, beyond the all too real hunger and poverty due in part to desertification, the loss of the power of imagination to sustain life on the island...Amedee's vision urges him to take the gamble and leave since his country is turning to dust and the tree of life may continue to grow and produce somewhere else (Malena: 96).

As discussed in Chapter 7, local 'systems of classification', spirituality and metaphors in Haitian culture serve as a way of sorting out attributes of the natural world for the rural Haitian. At the same time, these systems may also serve as an organizational tool for previously discovered relationships. This appears to be applicable to the 'Sacred Tree' and the 'Sacred Water Source' as outlined in the previous chapters. In the case of the 'Sacred Tree' species of Chapter 7, they filled a dual role of 'indicator species', or trees located in or near water sources, and as 'repository species' that spirits inhabit. Accordingly, the presence of 'protectors' of water sources, such as the Giant Crab or Fish, indicate that rural Haitian symbolism acknowledges both the vulnerability of the actual water sources and dependency of the local communities on the quality and abundance of water sources. These symbolic metaphors are indicative of the causal qualities of human interference within natural cycles as well as a desire for the Haitian's greater control over their local environment. If control over the cycling of water, trees, agriculture, and weather are assigned to the *loa*, then subsequently through ritual sacrifice and ceremony, Haitians appear to be attempting to gain greater influence over 'natural' phenomenon. Most importantly, these relationships show that there are strong environmental/societal/individual relationships between the rural Haitian and the landscape. These relationships serve as a fundamental section of the majority of Haitian religion and culture. I believe that through understanding these different *perceptions* of the natural environment and subsequent initial controls, change on any level has potential for being substantially more effective. Hence, the

‘Sacred Water Source’ and the ‘Sacred Tree’ serve as symbols fundamental to rural Haitian life and to the health of local ecosystems.

Trees are systematically associated with environmental health, community welfare and prosperity. The welfare of a forest estate often becomes the material expression of a community’s health; so tree cutting can mirror social disorder, as Pamela Leonard’s ethnography of China’s Sichuan region (Leonard 1995) so well illustrates. In the three historical periods she examines (the Great Leap Forward, the Cultural Revolution, and the present day), the treatment of trees is caused by, and reflects, society’s orderly or disorderly state. Villagers explain the massive destruction of trees in the late 1950’s as a reaction to the ‘Old Society’. The aim of the revolution was to destroy old ways, including the peasant conservation ethic and concern for kin and descendants...In Japan, where the social chaos caused by massive upland out-migration is reflected in environmental disorder, particularly well expressed by the condition of abandoned forest plantations. (Rival: 13, 28).

As the above quote indicates, trees often serve as symbolic representations of the integrity of a community and of the members of the community themselves. In Haiti, where there remains only 1% of original forest coverage, applying this metaphor to Haitian life is indicative of the political, ecological and economic hardships facing most Haitians today. As ‘Sacred Trees’ are scattered across the landscape and ‘Sacred Water Sources’ become contaminated with fecal matter, life for the rural Haitian becomes increasingly difficult. For these reasons, the deep-rooted spiritual connections between rural Haitians and the environment need to be emphasized and researched in depth. It may be that understanding these systems will aid in more effective, long-lasting environmental restoration of the Haitian landscape. Furthermore, development programs are more likely to be able to work within the preexisting social structures, rather than struggling through broad sweeping administrative projects, isolated from specific cultural awareness. I believe that, in order to change the circumstances of the rural poor in Haiti, local solutions need to be applied to local problems. Programs like the Cuban/Haitian Initiative in Fondwa as described in Chapter 6 create a balance between giving ‘foreign’ suggestions and listening to ‘local’ suggestions.

All in all, the collectivity of water quality, land use, labor, population and agriculture create intricate systems of complex interactions. In order to understand these interactions it is necessary to both *separate* the varying sections of the system in order to understand the details specific to each section and, once a certain level of understanding has been reached, to *synthesize* the previously separated sections and to recreate the whole system. This is done through increased communication, detailed observation, interdisciplinary cooperation, local participation and through full access to quality, open-minded education.

Education and Opportunity

The educational system [in Haiti] does not serve first and foremost as a means for human capital formation, but rather as a filter. The combination of French, poor teachers, and tough exams makes it exceedingly difficult for rural youths to pass the primary cycle. This, in turn, contributes to the peasants' isolation from political life by stifling social advancement and breeding ignorance. In this sense, rural education constitutes a medium of social control. (Lundahl: 89).

Contrary to the above quote, the isolation of rural Haitians due to poor education and the resulting high levels of illiteracy is not isolated to their exclusion from political and social life. It is also isolating them from basic necessities for sustaining life, such as clean water. As I discussed in Chapter 3, the control of water sources are directly tied to social and political control. Likewise, in Haiti it is very difficult to achieve significant levels of social or political control without education. Therefore, those who control water in Haiti tend to ignore rural Haitians when contemplating resource allocation. This cause-and-effect relationship will continue until rural Haitians have access to quality education and, therefore, water control. Additionally, the assumption of the 'ignorance' of rural Haitians is indicative of the observer's lack of multiple perspectives. The rural Haitian may not be educated as to governmental policy or even as to how to read the daily paper; however, as I have emphasized throughout this paper, the rural Haitian is learned in direct man/land interactions and may

be more in tune with the fragility of natural resources. What needs to occur is an exchange between these two types of ‘knowledge’ or educational systems eventually resulting in an interdisciplinary perspective of the local environment and systems therein.

Education, both formal and informal—like the CDRH Workshop in Cayes-Jacmel—is key to restoring water quality in rural areas of Haiti. Additionally, education is important in developing pride, self-esteem and opportunity for Haitian children. No matter how much I learn about water quality in Haiti, water quality will not improve in Haiti unless environmental education, from multiple perspectives, is emphasized in the everyday life of the rural Haitian.

Figure 8.1 Photo of Girls at ‘Maison des Soeurs’ Orphanage, Fondwa



I believe all children have the inherent potential to shine in one way or another. For this reason alone, all children deserve respect, attentive ears, and acknowledgement. The smiles on the children’s faces at the ‘Maison de soeurs’ orphanage in Fondwa illustrated for me the immense power that one child can have. They have the ability to *create* beauty out of what many see as emptiness, to *create*

excitement where many think it is hopeless and to *create* joy, not only for themselves, but to spread it to those around them. Personally, I have come to where I am now and have seen and experienced many things because of the things I have learned in school. I have been lucky to grow up in a region of the U.S. that reportedly has some of the best education systems in the world. Likewise, my opportunities for personal growth and enrichment have been virtually boundless. I have the luxury of choice and the privileges that come with quality education. In Haiti, where reportedly 70% of the population is illiterate, children are not being given the opportunity to grow and to learn about all of the wonders they possess as individuals, nor are they learning about the powers of their local communities. Therefore, these children face the consequences of lack of self-esteem, hard-fought pride, and political representation.

I strongly believe that the priorities in Haiti and around the world need to lie in education. This is not exclusive to education in the schools. Education extends beyond the classroom to the fields, where we learn to observe how plants grow and the earth provides us with food; to the streams where we watch the water that never stops coming; and most of all to the homes, where families, friends and neighbors communicate ideas and stories about their own experiences and those of their ancestors.

In order to initiate change, we need to begin realizing the fragility of our own existence in this world. We need to open our eyes to the differences and the similarities of the lives we live on this planet. Through communication, education, giving and receiving, I believe that we will begin seeing, if not understanding, the multitude of perspectives that exist within and across cultures—these perspectives are the daughters of the natural world and of the societies we struggle to maintain. By doing this, we will learn how to deal with the multifaceted issues of how we, as humans, relate to our environment.

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Appendix I: Field Journal excerpts

I did a lot of doubting during my trip to Haiti--Doubting of myself and doubting of others too, of our reasons for acting, our reasons for being. It was only when I started to look past my initial misgivings or attitudes towards people that I began to see their possibilities. As a young, western raised anthropologist, I questioned people like myself, foreigners, wealthy more than I questioned peasants and the everyday person on the street. In odd ways, our questioning of society, how I've been raised to fight against ideas of prejudice, of differences...it turns around on you in a weird way. I questioned the workers that were there from foreign countries, the aid organizations, the church groups, and the other whites in the airport.

I have the luxury of being an observer, a transient if you will. I had the luxury to see, to judge to learn, to share, then to leave. No questions asked, no real commitment, nothing. And this is what every foreigner represents, potentially. Someone who can come in, with new ideas, good or bad intentions, money and support, possible routes to new worlds and they install themselves however they see fit. Whether it is a development organization, a church group, or a student working on her thesis, in many ways the people being helped are mere shadows, ignorant to be changed.... So, as a person playing this transient role, how can we present ourselves in a way to be trusted and welcomed? I struggled with this throughout my trip. Wondering how and why I was there. What my real motives were and what others might think my motives were. I decided that the only thing I could really do was represent myself as honestly as I now how. As someone who could not stick out more as a foreigner, I was constantly being judged and questioned. There was no avoiding it and no way of defending against it except for showing. I had to earn my place everywhere I went and I wasn't always sure that I would be able to. I didn't succeed with every person I met on the street. But I do feel that I was successful with those that I let into myself. I had to show that I was willing to give of myself, that although I was transient in my actions...I was only there for weeks at most, that my heart and a piece of myself was not something that could ever leave these people that I worked, played, talked with and learned and taught from. I hope this is something that I was able to communicate to others and not just a feeling that I maintain inside of my mind and body.

Field notes/personal reflections

Day 1 Miami Airport January 8th, 2001

My thoughts tend towards fear- I have really never done something so alone. I don't know what to expect, where to go, what I'll see. At the same time, I feel excitement...of course I wish I spoke the language that would make quite a difference. This is good though. It will give me some real time to think-about my relationships and myself. I really want to be respectful-to learn-to try and understand. I really hope there is some way I can escape being the "blan" that is rich and has everything. Unfortunately, I don't think I can, nor will I ever be able to. What does a hole represent-my own insecurity-poor upkeep-reuse-We'll see.

I'm amazed at the disparity of what people say. How so few have so much and so many have none---as a Haitian citizen wouldn't you want to be working somehow to fix that. People laugh when I say I'm going to look at water quality...Maybe I will too.

But I don't want to be going to Haiti just for myself at the same time—I didn't like to think that I could represent that sign of "good" or "bad"... can't ever escape myself. And in some ways, I can't be myself either. I know I am a strong woman, person, and girl. I also know that I have fear...I feel like this naïve child everyone looks at and decides is silly, going on her little whim. I hope that's

not what I'm doing. I want to be more than that. (What does that word mean, "want"?) In some ways, I feel its stupid to be even testing water or talking about deforestation...if people are so desperate don't they just want to survive?

I think we should help parents to give to their children. They should look up to them and both may have pride in each other. I look at a lot of the whites on the plane and I'm questioning their motives for going to Haiti. I'm judging them because of their color—wondering which are "missionaries"—or whatever. Then I see how much I am "one of them" and I'm stuck questioning my own motives again. Questioning my thoughts—questioning how skin color can mean so much. My mind is racing. Part of me wanted to turn around and go home—part of me wanted to sell the ticket—part of me wants to cry—part of me...all of me wants to learn.

I'm here. I'm at Sebastien's---it's so beautiful here. God—there's so much to say and it's only the first evening. I can start with the fact that I'm listening to crickets, fogs in the distance, writing by candlelight as there is no electricity tonight. The sky is crystal clear—I spent about five hours in a bar with Georges—who picked me up and is extremely nice. We talked and talked in French and English about life—himself—everything. But then I told myself to relax—to not judge so quickly-to not classify everyone there as a bourgeois that didn't care—So I met a musician that said he was famous and we shared talking about the beauty of creating for oneself because if you create for anyone else—you're selling yourself short. And we spoke some of perspective—he said for him there is today-the present. The future is all in your head. How can we say what affects our actions will have in that we don't know what tomorrow will bring. He has a point but yet my insides want to fight it. No, we have to have long-term thinking, planning, but at the same time aren't we spending our lives thinking about tomorrow, the next step, etc.? We do think long-term it's there..we just don't think about the right things maybe

January 9th (pm)

Walking...drumbeats in the distance—mansions around followed by shacks. A boy sitting by a fire, man standing in the doorway—wondering who I am and why I am there—suspicion on both sides—regretfully. Darkness here on Pelerin—overlooking the city—hearing shouts in the distance—masses. Again, sitting in candlelight. Nannan purrs. Cows...beeps...crickets. I walked down the main highway day-during "lunch" and felt so bizarre. I was the only white—everyone looked with harried expressions. A woman shouted something from a bus.. not in a friendly way, with a look in her eye. Then men passed—one said something—then they all laughed. Some smiled, many scoughed. I've never felt so out of place and the fumes poured around black clouds but women sat there all day, everyday selling their bottles—candy—chicken....I saw one blonde woman and wondered "what's she doing here..She must be rich, a tourist-lives in Petionville. I just heard a frantic child screaming in the distance. A crash-then silence. I wonder what it was. No one will ever know. It's everywhere, violence—but we expect it more when they're poor. You know, "It just goes with the territory"

Oh, and I'm not afraid of the hole in my jeans anymore.

January 10-Ready to leave for Jacmel

I think my skin color delineates me from the rest of the crowd. But I want to break through tat-I feel as if maybe I need some guidance-I'm not sure what I'm supposed to expect-but I don't want to be sheltered-you know. Tennis courts, banana pancakes-Evian. This is not what Haiti is to most, but

the fact that it is to some—that's what matters. Waiting. I'm not good at that. How can one escape when all of the people controlling are the minority and most of them couldn't give a damn about the rest? How would I live if I was here? Where would I send my kids? How can I explain that I want to live with a family—if I can give them money instead of some hotel that, I'm sure has enough. Someone says, "I have no money"—yet he travels all the time, wears Oakley's and pays \$250 US to have the lenses fit...How much do I do this? Isn't this what we're teaching---mass consumerism? The only way to go. Maybe I'm naïve, in fact I know I am—but there has to be something else out there.

Jacmel, Jan 10th

So we came. Be true to your convictions. We went, after waiting forever to Cayes-Jacmel, a small village that is so beautiful. Crashing oceans, trees—beautiful colors. It was so interesting to see the immense change in vegetation between here and PAP. Really, it was crazy...there was no vegetation no trees, until we approached Jacmel. Supposedly, this area had always been targeted as special "zones" to protect in some ways. There look to be quite a few old, dying attempts at terracing, but there's really not much. So, we talked—Sebastien talks a hell of a lot, but he's so passionate too. Paradoxical, just like the country. I really love it here in Jacmel. It's so much softer here—PAP is really harsh, mean in a lot of ways. I'm dying to do my "thing" but at the same time I'm really seeing how my patience and nonjudgmental approach allows me to learn. I'm learning Creole---thought it was French. I think I'm going to stay with a woman and her family from Cayes-Jacmel. I hope I can. I think it would really help to get started early.

Jan 11th Cayes-Jacmel

I'm so lost right now. I really at some point today felt really good. But now, I feel like there's no reason for me to be here. I'm not a specialist—I'm not helping these people. I'm just a 'blan' who is laughed at, called a racist, advanced upon. I can't escape it. They look at me as if I have no reason to be here. And they're right. What is this? Some way for me to "explore" myself? How is it that our "studies" are so demeaning and what am I doing other than doing that more? They gave me food and I didn't want it, but I have no choice. The only reason they would be interested—men at least---in talking to me is because I'm a tall blonde. I feel hated and I'm hating myself for being here. I was talking with this guy---hiking through the forests with Lissage and this guy and I thought we were having a very interesting conversation. Suddenly, he starts coming on to me...asking about Matt. Why and American? And then he likes me, etc. I finally say enough—I've already explained...please stop. Then he tells me when we stop that I can take a child home with me. I say no, I don't want a child. He says that it's the color of his skin that's not adorable. That I have talked a lot and revealed how I think. That he studies psychology and all American's are racist. I'm racist, there are no exceptions. I just don't know what I can do. I couldn't keep from crying while I forced food down my throat. Who's the mean one here? He asks. I guess me. Then I watch as little kids throw all their trash to the coast. Just piling it up—but who really gives a fuck? You know. Then someone just came—they're inviting me into their house and it was very nice. Welcoming. But then again—I just gave kids some gifts and it was crazy. Some, like Raymond were very sweet as is Janita. But I guess like all kids—they were crazy and then, many of them very nice. But at the same time, I feel like the rich white girl who gives gifts. At the same time—I think if I gave them to the parents, they would disappear...Then again, there's something really nice how they're sharing and giving things away—no fights. And yet again, a woman wanted to give her child to me again. How must this make the child

feel about herself? And she's this beautiful little girl right next to me---so sweet. I guess like my moods are paradoxical, it goes with what Sebastien was telling me----opposites at each point. I'm so conscious of myself. I don't know what I'm doing---well I know, I'm staying at Jacelyn's—the sister of Gerald. And I know that tomorrow I'm going to Marigot to test more water. And the mayor's office tomorrow...So, I should prepare. Jeanita made me some corn meal with sugar and coconut milk—it was very good. So now I'm feeling better again. But at the same time, I just don't know what to say...I guess I'm learning

Jan 12

Why would it be better for kids to come with me? To them—well it would be. They would eat, have clothes, have school, have water, medicine—it's not here. I thought things were similar, but they're not. I think the sense of self is much different. These kids do a lot, yet there isn't enough to do---with everything there's such an opposite side. In school, they're learning French, English, Spanish, but have they really learned?

For each test I have learned that I need to ask an authority. There are the responsibilities for each. When I first tried to test the water—someone came to tell me that I really needed to talk to the mayor, community counsel, etc. We marched through the forest yelling to ask for permission for seeing the water. Having a role, or position...

Now, I feel like I have been in a wonderful paradise. All day I hiked around with a man from Cayes-Jacmel who was so nice. I got his address so I can give it to Stuart for his list. What he is trying to do is so wonderful. It is so similar to what I would want to do. He's studied psychology of children and has organized a grassroots organization for artisans, cooking, agriculture, water capture. All sorts of things. But he doesn't only want to do that. He wants to bring in people from the mountains who have nothing and he wants to give them as much as he can--community support. It's really so wonderful to meet people who are like this. They do have something in a place where it is really hard to get anything and all he wants to do is give back. I hope to help him as much as I can...and staying last night with Jacqueline was very interesting... Think I'm learning that really doing what you say and really saying what you think is best. Lafond and I were talking about politeness and how I have been feeling a little lost. He told me how it was just a learning experience all of it. And that people can tell if I'm trying. Then I ate mangoes under palm trees with all these wide-eyed kids around. I hate to think of how many of them don't believe in what they are capable of. Someone needs to let kids know how wonderful they are. That's why I like spending time with them—responding to their curiosity, showing they can do the things...Then we returned after he had given me food that the women of the village were preparing for the group meeting---just as a way for them to help out. So, I sat by the beach testing more water and writing. Then these little boys came up to me and I showed them my tape recorder. They were so excited to hear their own voice. They start singing and drumming carnival songs. It was so wonderful. They laughed and I laughed. We could communicate...Children are so open and curious—life has not worn on them and it doesn't have to wear on us—It's when you meet those people that haven't let things get them down, but have pushed through and given, loved, accepted others. That's when we open our lives, our hearts and our minds to new people and ideas. I think that's when you're “successful”—that weird word that we're so obsessed with in American.

I've never wanted to know what people thought of me more than I do here. I know a lot of them don't like me. That's not even a question and I know that they don't have any idea who or what I am. Some of the time I feel like I'm talking bullshit—I'm holding back. Because I'm afraid of asking what I want to know, what do you think I'm really doing here? What do you think my motives

are? What are you're ideas of me because I'm this white girl who obviously has a lot, right? At the same time, I want to ask myself the same things.

I played in the ocean with some young boys swimming naked around curious, wanting to play. I think I'm breaking through some barriers in my own head. And am realizing that acceptance is not something that is immediate, it's something that we have to earn. And if someone gives something to us—we give back what we can. I'm lost in this trap—am I helping them or are they helping me? I think the problem is it's both.

Education. That's what's most important to all of them. That's what's most important to me—to learn and to share with others the things I have learned and that I think are worth sharing. Generosity...that's important too. To give to others without hesitation. To not be afraid of being myself...to speak what I think, but to listen because people surprise you—in good ways and bad. But I think I can learn from both. I don't want to be "blan" and I'm becoming "Tara" to more and more people. That means something because it's not just a name—it's who I am. A person, each of us a living, breathing person that only knows how to be themselves—if we're lucky. Some don't even know that.

Jan 13

So, I feel like crying again. But this time it's because I have to leave Cayes-Jacmel. Today was such a wonderful day. I wrote my report—taught at least 20 community leaders about how they can protect their water source, and then I talked and played with kids. James climbed a tree for me and they opened a fresh coconut for me. I drank the milk from the coconut while Christbita made fresh juice. I played with the boys this morning—we played basketball at the "school" I was so wonderful-I felt so accepted as I spoke French and the kids spoke kreyol. They were joking with me, asking me if I could stay with them again—when I was coming back, etc. They made me present, brought me food...The grandmother and people who liked suspiciously at me welcomed me and looked as if they didn't want me to leave. When I spoke to the seminar—everyone really listened—they were concerned about what I had found and according to Harold—they've already started planning. It's one of the first times I have really felt my impact somewhere. And although I don't know as much as I should—I know enough to help these people at least to educate them about their own health and their children. People were coming up to me left and right asking what I had found and wanting to know what they can do...On man, older and with this wonderful smile, came up to me and asked me something in Kreyol. I couldn't quite figure it out as he held my hands in his. Then someone told me that he had asked—since I was studying medicine—he had a sickness in the head and could I tell him what it was—I was touched and almost wish I had even tried, just not to let him down. Afterwards, Raymond convinced me to come swimming with them—They have no care, these kids, yet at the same time, they have all the hardships. They are the ones that have to deal with all of this disease, poverty...upheaval. It made me want to cry when Raymond had a condom and told me they use it as a ball for football. He asked me if we had those too. He wanted me to explain it to him...I don't think I did. I wanted to stop right there and teach all of the community especially the children and the women about sex, respect, AIDS, life...The life that I know about and I want them to show me more of the life they know about.

I felt and feel like crying right now. Because I don't know if I'll ever see these kids again The ones that drew beautiful picture for me, played with my hair and leaned against my shoulder. I miss my little sisters. Here I have learned so much in five days. I've fallen apart and frown together—probably to happen again I realize that I have been so lucky. I have done and lived so many lives and

I'm only 21. I guess I am paradoxes. Maybe that's why there's such confusion inside. I need to earn things more; I'm learning patience, not to judge quickly and that difference do count. I've learned that stereotypes hurt—people are very different and cultures have many similarities—but we are very different too.

Now I have arrived in Fondwa. It's really a luxury place. The people seem nice—I feel

Jan 14

The visiting Cubans and Roberto (Agroforestry) and Simone (animal vet), the Cubans who are working here in Fondwa just explained their project and what they are doing here. It was amazing how much I agree with their philosophy and approach here in Fondwa and in Cuba. My thoughts are racing as to how I might work with them one day...International agroforestry and ecological restoration (IAER)—would be a good nonprofit, eh?

I forgot to mention that yesterday we met with a youth group too—which was very interesting. We asked questions as they asked back. Women definitely have a specific role here—but supposedly they have “the same rights”. But still you see these women with many kids, the men have left and they track care of everything—that doesn't seem like “social equality” to me. In many ways it's about empowerment, but at the same time, it may be that the profession of mother is more important of respected that in the states. I think my mom is right women and men alike, who decide to make family their business should be paid by the state of the community for gratitude. After all, that will cut down on the amount of people on welfare, even kids ‘causing trouble’.

Jan 15

7 thousand people—one small clinic.

There are so many nationalities here—it's really amazing. I'm wondering if this stay in Fondwa is not too culturally isolated. We're in the big white community center—and the rest...Haiti is beautiful and I like many things here, but at the same time I'm missing that spiritualism that everyone talks of. I don't feel exposed to that, maybe because that takes time trust, etc. I do feel that I am missing home—although I felt a community forming some in Cayes-Jacmel. I enjoyed being right in the middle of things living the same lifestyle as those living here. But I'm also being exposed (or exposing myself) to a lot of very interesting people—American, French, Dutch, Cuban, and Haitian. We just had a dance party with six of us. Joyce and I had a really great conversation today—We talked about so many interesting things—basically about ourselves. I like her a lot, and would like to try and keep in touch—ideas are important. It's so interesting to see how many intersecting cultures there are here—very opposites. Today, Thomas and I took a long walk—hiking in the rain to Minik's house to see the pigsty—Tomorrow, I think I'll go back to the orphanage in the afternoon, finish my tests during the day and sit in on the Cubans' seminar with the groupmen...I'm very interested in hearing more about their farming systems...

Jan 16

I slept a lot last night, but not so well because I had bad dreams that made me tense. I dreamt about fighting with Matt because he was with other girls...the same old thing. I think maybe by writing these things down I may be able to clear my subconscious and maybe my conscious of these things—to be able to trust each other and not be possessive of one another—will make us both

happier. Then I dreamt I was in a play where some women, a mother, was going to kill her son to get his money and because the son had done something bad to her. I was pleading and sobbing with her as she was going to stab him—it was supposed to be a knife, but was really a comb. I wonder if this is reflective of something I'm thinking about here—about how children are treated how there are too many of them and many of them don't have people that really care about them.

I'm really missing home right now, maybe it's because I don't feel as useful here as in Cayes-Jacmel. But I think it's mostly because I want to be with my friends, in my house, at school. I don't think there's as much as I expected here for me to do—etc, but I've also learned a hell of a lot—I think. It's not all synthesized yet. I definitely feel more attaché to Cayes-Jacmel than to here...again maybe it was the circumstances—being completely immersed...I'm moving up to Joyce's room today—and I think I'm going to go to see Chet and his projects in the next town..I want to hike...and maybe go back to the orphanage too. It's great how much a part of life singing and dancing is...in meetings, bringing people together.

Jan 17

The sun may shine
Smiles sincere?

I feel understanding, clearness but longing. Not the same as before. Needing, wanting to be back—feeling surrounded by people...Counting pills which equals the days two more from today—but with today equals three. How many languages? I don't like the new people and I'm not quite sure why—there's some weird feeling. The horse struggles with hundreds of pounds---the rest, rest on their heads---the future on their shoulders. Falling earth from years of slavery. Injustice is forever, forgiveness is rare. "We"—reenact the feelings through misunderstanding, ignorance. A baby cries like the chickens ready for slaughter—tonight's dinner—keeping the fashion while poverty is everywhere. Beautiful blue-phalo on school children's swinging arms and grandmother's with kilos. Foreigners abound—what are they doing—who can we trust? No one really knows. I'm bored...people sit around so mach at this center==other places, I don't know...

Jan 17th

I have so much. I feel guilty when I talk to Haitians. They can't travel, they live in shacks—education is a minimum and yet they still give. The "shacks" are beautiful and I don't think they feel shame when they invite you in. They shouldn't, I think our culture would want them to. Pride is a funny thing, yet quite important. I meet kids at APF my age, then I see the house they live in, the size of half of one floor of my house—for five children, a cousin, grandmother, grandfather and mother. What happens when it rains? We cry if there's not enough air conditioning---what about clean water, food enough for your children, and communication. I don't think I can comprehend their world and likewise, I don't think they could comprehend mine. I live in a very large world—other's don't' in my world I see very little obstacles. In theirs, few options. I don't think I'm comprehending how hard life is...because it's never been hard for me. It's me who feels ashamed for what I have, but I'm not sure if that's the right reaction either. I'm a transient...how long do I want to be one? A white horse walks towards me—out of the sunset. We don't know each other, but we still say hello. I don't think she trusts me as she canters away—her leash dangles behind—and on the hill I still remain.

I think I have seen the desert and it was in the ghosts of the rainforest. I didn't know her either, but she spoke to me. We didn't understand each other. She is vulnerable but cannot cry like I do. We

haven't been raped, but have felt used...powerless and dull. But we don't give up—don't' ask us why. There's something about solitude—it gets lonely. It's nice to give without forgetting who you are. Stones break and they build, we are synonyms. I'd like to build without erasing what others before me have made. Not all paintings are beautiful—only the ones from our soul. They talk—we can communicate. That is the key. But different keys match different doors—and I prefer ones without locks or better yet, without doors, or even, better yet, without walls.

Physical growth is inhibited, but how about inside? Are there limits? Who made them and do I choose to listen? Maybe, maybe not.. I don't have to answer do I---It's nice to say hello-restructured, detached from our script. Even if the lines are nice—they aren't ours—whose are they? Even used she is beautiful, isn't she? Sienna—a beautiful color. She longs to be caressed. She is lonely, I think. Maybe she's tired of endless fertility, her work is done. I would be tired. I would want myself back even if they didn't want to return.

Jan 18

I've just come from the orphanage and I just feel like crying. They're so innocent—so gentle, but they're living in such complete and total poverty. I realize how many kids there are—with nothing but their smiling faces—as they are abused, beaten, disregarded. I feel sick just being there—it smells of urine, one young girl was naked and crying because her leg was horribly infected because she had been burned. I drew with them and sang—they smiled and so did I, but now I want to cry. The girls come up and just want you to give something—I want to, but it's not the right thing to teach them—they think that strangers are the ones who give—I don't know what the thing to do is...It's a complicated subject, I have to think more. Singing is a great thing for the kids—and adults. They're not afraid to sing out. "If you want to sing out, sing out" What is the best thing to do? I don't think there is one answer, but you have to be yourself. That's what I can give—honesty and trust—and nothing is fast. We expect things to come so quickly—but waiting is a way to grow, to be sure what you want and to be true to yourself. I want to be true to who I am and I think these past days I have been. I haven't been afraid to show who I am inside because I so want to show here that I'm not what they assume of my outside. I think I've done this pretty well, as best as I can right now. I feel like smiles have become genuine where I go...I want that to continue.

I don't think I trust enough because I feel like I need to protect myself from injury. But by doing that I am closing off a beauty that is within me—that comes from acceptance of myself and of others (neither one is more important than the other). A few nights ago, I had two dreams about my birthday—two very opposite dreams. One was full of happiness, luxury and surprise--the other mistrust, sadness. Things pass so quickly. I am in Porte au Prince again--This time, in an extremely wealthy house. I cried leaving Fondwa. I will miss everyone a lot and I really got the feeling that they will miss me too. I got big hugs from everyone and smiles—I think I did more than I thought. And I think we communicated more than I thought.

There is something magical about this place, but I don't think I'll truly realize it until I have left. My heart is full-I am lucky to meet such people knowing them makes me proud in who I am and in who they are. On this trip I am seeing so many forms of "developments" or aid. "Helping" is not an easy thing and I think it is often paradoxical. I resolve to search for good in an out...and I know that can be found most anywhere. Caring in the way you know best is important. I don't feel like I'm hiding right now—I feel the opposite, not dulled like I had been before. Afraid...Maybe it is the "wild woman" insides, as the book says. But I think it's an acceptance of uncertainty—of not being strong,

of not being accepted and of letting all those things be okay. It's true that I need to choose my battles, but not everything has a battle to be fought. Kids can teach you that. Haitians have taught me that time is a relative thing and something to be cherished and used too. It really isn't ever wasted unless your attitude makes it that way. We create our own 'world', our own perception as it were. I feel healthy right now and I think I can stay that way. Stress is something I create for myself and sometimes give to others.

Today I went from a urine-stained mattress and runny noses to an Italian leather couch and I think I can learn very much from both of them. I too, can share who I am. It hurts to leave. But I know a part of me stays and they come too. I can make promises, ones that I keep—they are beautiful. I mustn't forget smiles—as I hope they don't forget mine. I have a lot of wonderful things to do. And I do want to cry. Genuineness. Openness. Touch and feeling. If it doesn't click, then no big deal. Instincts are everything—but yet they too can be wrong. Just listen a little before you decide. Think for a while—take your time, don't commit. I am a woman and a girl. And I miss things and people and always will. They have made me, piece by piece—Cake is good, but so are mangos. There is no real better or best. I am alone within myself, but that is the only place.

Jan 19th

So, oddly enough, here I am where I first began--At Sebastien's in the candlelight. But so much has happened since. Today, I went to Bel Fonten—really, the most rural place I've been. Somehow, after hiking for an hour or so for water sources—I ended up in a discussion of voodoo, which was amazing. So spiritual, yet not offensive, and I wonder why that is... Then, as we have 9 people in the SUV and we bound through rivers, I think of so many things—as I try to understand some Kreyol. Tonight—I ate chevre and drank champagne—danced and spoke of art, perception and light... Such different worlds—It's hard to believe that I transitioned from one to the other so quickly

Jan 20th

Last night I dreamt of different scenarios after coming home—I couldn't explain what I had felt here—and I was grumpy. That's all I can really remember—luckily not reality.

Love and care comes from all walks of life—all cultures, all religions or lack thereof. I don't think everything will really hit me until I get back. I miss everyone—Everyone asks me when I'm coming back to Haiti—and I don't know—if I will at all.

Appendix II: Haiti--World Development Indicators (1960-1996), 1998

Table 1. Haitian Population Statistics (1960-1996)

Year	Population total	Population growth (annual%)	Population density (people per sq km)	Population density rural (people per sq km)	Urban population
1960	3804000	.	.	.	.
1961	3868520	1.6719	140.3671	792.5748	.
1962	3934650	1.695	142.7666	783.1827	.
1963	4002420	1.7077	145.2257	774.4217	.
1964	4071870	1.7203	147.7456	766.2519	.
1965	4143000	1.7318	150.3265	758.6293	.
1966	4215750	1.7407	152.9662	751.1366	.
1967	4290140	1.4192	155.6654	736.2783	.
1968	4365880	1.75	158.4136	729.8671	.
1969	4442580	1.7416	161.1966	716.4993	.
1970	4520000	1.7277	164.0058	717.8297	.
1971	4598210	1.7155	166.8436	719.6649	.
1972	4677300	1.7054	169.7134	717.3064	.
1973	4757260	1.6951	172.6147	723.2865	.
1974	4838130	1.6856	175.5489	725.0744	.
1975	4920000	1.678	178.5196	726.8604	.
1976	5003000	1.6729	181.5312	728.4742	.
1977	5087240	1.6698	184.5878	736.9366	.
1978	5173220	1.676	187.7075	731.8445	.
1979	5261630	1.6946	190.9155	740.4899	.
1980	5353000	1.7216	194.2308	749.42	1268661
1981	5447430	1.7487	197.6571	753.6937	1317188.5
1982	5544990	1.7751	201.197	759.5628	1367394.5
1983	5646120	1.8074	204.8665	765.7089	1419434.5
1984	5751350	1.8466	208.6847	773.5722	1473495.8
1985	5861000	1.8886	212.6632	783.2331	1529721
1986	5975030	1.9269	216.8008	792.6369	1591747.9
1987	6093380	1.9614	221.0951	802.3869	1656180
1988	6215940	1.9914	225.5421	812.4559	1723058
1989	6342570	2.0167	230.1368	819.8486	1792410.2
1990	6473000	2.0356	234.8694	830.4101	1864224
1991	6593000	1.8369	239.2235	838.6771	1938342
1992	6722040	1.9383	243.9057	840.255	2016612
1993	6860560	2.0397	248.9318	850.2194	2099331
1994	7009040	2.1412	254.3193	861.1106	2186820
1995	7168000	2.2426	260.0871	872.96	2279424
1996	7336000	2.3167	266.1829	.	2378331

Table 2.Haiti Labor Force Statistics (1960-1996)

Year	Labor Force total	Labor force in agriculture (% of total)	Labor force female (% of total)	Physicians (per 1000 people)
1960	2138562.2	79.9253	47.4743	0.10515247
1961	2160011.5	79.4224	47.3608	.
1962	2181675.9	78.9087	47.2473	.
1963	2203557	78.3844	47.1338	.
1964	2225658	77.8493	47.0203	.
1965	2247981	77.3034	46.9069	0.0697562
1966	2270529	76.7465	46.7933	.
1967	2293302	76.1788	46.6799	.
1968	2316303	75.6001	46.5664	.
1969	2339535	75.0106	46.4529	.
1970	2363000	74.41	46.3394	0.079867257
1971	2379567	74.0757	46.1648	.
1972	2396251	73.7385	45.9902	.
1973	2413052	73.3985	45.8156	.
1974	2429969	73.0557	45.641	.
1975	2447007	72.712	45.4665	0.080699195
1976	2464163	72.3618	45.2919	.
1977	2481439	72.0108	45.1173	.
1978	2498838	71.6569	44.9427	.
1979	2516357	71.3005	44.7681	.
1980	2534000	70.9414	44.5935	.
1981	2567726	70.6357	44.4544	0.110143682
1982	2601901	70.3272	44.3152	.
1983	2636530	70.0187	44.1761	.
1984	2671621	69.7073	44.0369	0.140836499
1985	2707178	69.3941	43.8979	0.137007337
1986	2743209	69.0791	43.75872	.
1987	2779719	68.7622	43.6196	.
1988	2816715	68.4436	43.4804	0.142697645
1989	2854203	68.1231	43.3413	.
1990	2892192	67.8009	43.2022	0.080024718
1991	2943429	.	43.1718	.
1992	2995576	.	43.1413	.
1993	3048645	.	43.1109	0.09212076
1994	3102655	.	43.0805	.
1995	3157622	.	43.0501	.
1996	3213563	.	43.0196	.

Table 3. Fertilizer Consumption in Haiti (1960-1996)

Year	Fertilizer consumption (metric tons)	Fertilizer Consumption (100 grams per hectare of arable land)	Private consumption per capita (constant 1987 US100 21 22 100)
1960	.	.	.
1961	100	2.4390239	.
1962	100	2.380952381	.
1963	100	2.325581395	.
1964	100	2.272727273	.
1965	100	2.222222222	.
1966	150	3.260869565	333.6932
1967	150	3.157894737	304.9933
1968	150	3.092783505	303.1979
1969	269	5.38	303.8235
1970	358	7.089108911	296.0375
1971	350	6.862745098	312.5760
1972	1398	26.98841699	314.2483
1973	1400	26.92307692	304.9940
1974	1616	30.78095238	323.4988
1975	2100	39.6226415	303.0164
1976	300	56.074766	333.8328
1977	3100	57.94392523	341.1077
1978	3600	66.05504587	338.2931
1979	3900	71.55963303	338.6233
1980	400	73.66944954	357.7145
1981	5800	105.8394161	350.1623
1982	4600	83.63636363	318.8175
1983	3200	57.97101449	322.8857
1984	3800	68.71609403	307.8934
1985	3200	57.86618444	312.2426
1986	2100	37.97468354	305.7578
1987	2300	41.59132007	303.8707
1988	2200	39.7830018	302.7898
1989	3700	66.666666	316.7081
1990	1000	18.01801801	329.9037
1991	2900	52.25225225	348.9603
1992	4300	76.78571429	310.0264
1993	4100	73.2142857	310.8163
1994	5100	91.07142857	272.9261
1995	4800	85.71428571	297.8807
1996	.	.	298.8327

Table 4. WDI Economic Indicators for Haiti (1960-1996, averages)

Year	Crop production index (1989-91=100)	Food production index (1989-91=100)	Agriculture value added (constant LCU)	Resource Balance (constant 1987 Us100 31 22 100)	GDP at market prices (constant 1987 US100 31 22 100)	GNP at market prices (constant 1987 US100 31 22 100)	GNP per capita (constant 1987 US100 31 22100)	Net income from abroad (constant US 100 31 22 100)
1960	.	.	.	.	.	.	.	.
1961	76	70.2	.	.	.	.	.	.
1962	74.4	71.6	.	.	.	.	.	.
1963	76.8	73.9	.	.	.	.	.	.
1964	78.3	75.3	.	.	.	.	.	.
1965	80.2	77.5	9797340699	.	.	.	.	.
1966	80.4	79	9800555899	-49169729.59	1077534273	1048164182	248.6305	-29370091
1967	82.4	82.3	9343967910	-24024073.48	1034395926	1008364382	235.0423	-26031544
1968	81.9	83.3	9343967910	-24228503	1053191900	1025378062	234.8617	-27813838
1969	84.2	85.8	9253937379	-25645947	1083388783	1054240575	237.3036	-29148209
1970	86.9	88.2	9061012227	-62200430.4	1079691211	1049075649	232.0963	-30615562
1971	89.6	90.9	9640428912	-58325017	1170898002	1138701305	247.6401	-32196697
1972	91.6	93.6	9590911050	-71488879	1187074873	1152828765	246.4731	-34246108
1973	91.5	95.2	9497664497	-50793596	1201218097	1169508238	245.8365	-31709860
1974	93.2	97.5	10380615460	-58485725	1277141589	1244064556	257.1374	-33077033
1975	94.5	99	10264860040	-74118717	1247530166	1218452959	247.6530	-29077206
1976	95.6	101.8	10771608770	-136848638	1354235919	1324332727	264.7077	-29903193
1977	93.7	99.4	10128527670	-192061095	1360706731	1324666856	260.3900	-36039874
1978	96.8	104.6	10315020780	-180454685	1426030436	1384943894	267.7140	-41086541
1979	103.3	106.7	10983825120	-139449333	1530147928	1491127613	283.3965	-39020315
1980	103.8	104.9	11080287690	-144753945	1646036126	1605544476	299.9335	-40491649
1981	103	104.9	10925948230	-229644383	1601018110	1563131841	286.9484	-37886269
1982	104.2	105.1	10462929840	-117169257	1546170822	1507867830	271.9333	-38302992
1983	107.8	108.9	10070649960	-153689116	1557910605	1513366807	268.0365	-44543798
1984	108.1	110.6	10424344150	-129489082	1562532591	1525458770	265.2349	-37073821
1985	108.4	111	10475790640	-233673413	1565613862	1528496888	260.7911	-37116973
1986	108	110.2	10745885520	-182057289	1563765036	1530927414	256.2208	-32837622
1987	105.3	108.2	10713731060	-204400000	1552056174	1515128919	248.6516	-36927255
1988	104.1	104.4	9440430485	-169374781	1564073147	1514521327	243.6512	-49551821
1989	103.9	103.9	11202472690	-201078367	1580712264	1542472449	243.1936	-38239814
1990	98.8	98.8	10958744750	-303070845	1791717074	1542320474	238.2698	-36851233
1991	97.3	97.2	10942700000	-451906883	1531103201	1496202403	226.938	-34900797
1992	92.2	95.1	10825000000	-259931253	1304686584	1276858099	189.9509	-27828485
1993	88.9	92.8	10548500000	-467696127	1270269379	1242779608	181.1484	-27489772
1994	87.8	94.2	10367800000	-327475587	1136079179	1110835167	158.4861	-25244012
1995	83.5	88.2	10471400000	-1046301217	1187534887	1160202263	161.8586	-27332624
1996	84.6	91.4	10659900000	-1133079569	1211286256	1187575473	161.8832	-23710782
Averages	92.80555	94.6	10265336229	-222647918.8	1363088746	1322501289	241.0327	-33731154.5

Table 5. CO2 Emissions in Haiti (1960-1996)

Year	CO2 emissions industrial (KT)
1960	285.8
1961	296.8
1962	300.4
1963	249.2
1964	296.8
1965	304.1
1966	304.1
1967	263.8
1968	263.8
1969	315.1
1970	388.4
1971	403
1972	392
1973	417.7
1974	472.7
1975	480
1976	674.2
1977	707.2
1978	754.8
1979	754.8
1980	751.1
1981	765.8
1982	824.4
1983	897.7
1984	912.3
1985	941.6
1986	842.7
1987	912.3
1988	1011.3
1989	1051.6
1990	1025.9
1991	1047.9
1992	846.4
1993	589.9
1994	564.3
1995	637.5
1996	.
Averages	609.65

Table 6. Energy Consumption in Haiti (1971-1996)

Year	GDP per unit of energy use (1987 US kg of oil equivalent)	Energy imports net (% of commercial energy use)	Electricity production from oil sources (% of total)
1971	8.803744	100	100
1972	8.992991	95.45454	33.96226
1973	8.580129	93.57142	9.836065
1974	8.186805	93.58974	25.16556
1975	7.895760	93.03797	37.87878
1976	6.212091	93.57798	19.69696
1977	6.047585	93.77777	21.53110
1978	5.820532	93.46938	23.67346
1979	5.907907	93.05019	23.21428
1980	6.830025	92.11618	29.93630
1981	8.085950	90.40404	39.51612
1982	6.442378	93.33333	51.28205
1983	5.813099	94.02985	53.77128
1984	5.600475	94.26523	54.97630
1985	5.571579	94.30604	56.91609
1986	5.625054	94.24460	57.11060
1987	5.105447	94.73684	61.53846
1988	4.739615	95.15151	65.48598
1989	4.516320	95.42857	66.95652
1990	4.245085	89.51612	20.60301
1991	4.503244	91.47058	25.42732
1992	4.181687	91.02564	20.09456
1993	4.848356	90.07633	13.15068
1994	13.52475	75	5.693950
1995	3.326428	91.03641	20.60606
1996	.	.	.
Averages	6.376281	92.62681	37.52095

Table 7. Land-Use Allocations in Haiti (1960-1996)

Year	Land use permanent pasture (% of land area)	Permanent pasture (hectares)	Land use cropland (% of land area)	Cropland (hectares)	Irrigated land (% of crop land)	Irrigated land (hectares)	Agricultural land (hectares)	Agricultural land per worker (hectares)	Arable land (hectares)	Arable land (hectares per person)	Area under cereal production (hectares)	Total land (hectares)
1961	21.2264150	584999.957	24.31059	669999.948	5.223881	35000	1255000	.	410000	0.105983	452000	2755999.8
1962	21.407837	589999.944	24.85486	685000.031	5.547445	38000	1275000	.	420000	0.106743	453000	2755999.8
1963	21.5892597	594999.954	25.39912	700000.184	5.42857	38000	1295000	.	430000	0.107435	453000	2755999.8
1964	21.7706821	599999.955	25.94339	714999.999	5.594405	40000	1315000	.	440000	0.108058	459000	2755999.8
1965	22.1335268	609999.955	26.48766	730000.273	5.47945	40000	1340000	.	450000	0.108616	460000	2755999.8
1966	22.3149492	614999.955	27.03193	744999.985	5.637584	42000	1360000	.	460000	0.109114	462000	2755999.8
1967	22.4963715	619999.954	27.75761	764999.986	6.013072	46000	1385000	.	475000	0.110718	468000	2755999.8
1968	22.6777939	624999.954	28.30188	780000.049	6.410256	50000	1405000	.	485000	0.111088	463000	2755999.8
1969	22.8592162	629999.954	29.02757	800000	6.875	55000	1430000	.	500000	0.112547	480000	2755999.8
1970	23.0406386	634999.953	29.39042	809999.716	7.40741	60000	1445000	.	505000	0.111725	483000	2755999.8
1971	23.2220609	639999.953	29.75326	820000.027	7.926829	65000	1460000	.	510000	0.110912	487000	2755999.8
1972	23.2946298	641999.953	30.26124	834000.000	8.393285	70000	1476000	.	518000	0.110747	491000	2755999.8
1973	22.3149492	614999.955	30.47895	840000.336	8.33333	70000	1455000	.	520000	0.109306	429000	2755999.8
1974	21.4078374	589999.957	30.84179	850000.000	8.235294	70000	1440000	.	525000	0.108512	390000	2755999.8
1975	20.3193033	559999.959	31.20464	860000.000	8.139534	70000	1420000	.	530000	0.107723	378000	2755999.8
1976	19.230769	529999.955	31.56748	870000	8.045977	70000	1400000	.	535000	0.106935	360000	2755999.8
1977	18.8679245	519999.961	31.56748	870000.000	8.045977	70000	1390000	.	535000	0.105165	402232	2755999.8
1978	18.6865021	514999.962	32.11175	885000	7.909604	70000	1400000	.	545000	0.105350	465843	2755999.8
1979	18.5050798	509999.962	32.11175	885000	7.909604	70000	1395000	.	545000	0.103580	444450	2755999.8
1980	18.4687953	508999.963	32.29317	889999.999	7.865168	70000	1399000	0.778519755	545000	0.101812	413000	2755999.8
1981	18.4325108	507999.963	32.47460	895000	7.821229	70000	1403000	0.775995575	548000	0.100597	391000	2755999.8
1982	18.3962264	506999.963	32.54716	897000	7.803790	70000	1404000	0.770159078	550000	0.099188	376000	2755999.8
1983	18.3599419	505999.962	32.61973	899000	7.786429	70000	1405000	0.76358696	552000	0.097766	410000	2755999.8
1984	18.323567	504997.469	32.72859	902000	7.760532	70000	1407000	0.75726588	553000	0.096151	415000	2755999.8
1985	18.2873730	503999.963	32.76487	903000.000	7.751937	70000	1407000	0.75	553000	0.094352	440369	2755999.8
1986	18.2510885	502999.962	32.76488	902999.999	7.751937	70000	1406000	0.742736397	553000	0.092518	480140	2755999.8
1987	18.1785195	500999.963	32.76488	902999.999	7.751937	70000	1404000	0.7350785	553000	0.090754	476220	2755999.8
1988	18.1059506	498999.963	32.76488	902999.999	7.751937	70000	1402000	0.7279335	553000	0.088964	489911	2755999.8
1989	18.069666	497999.958	32.83744	904999.412	8.287298	75000	1403000	0.7217078	555000	0.087503	466000	2755999.8
1990	18.0333817	496999.963	32.83744	905000.000	8.287292	75000	1402000	0.7142129	555000	0.085740	351500	2755999.8
1991	17.9970971	495999.960	32.83744	905000	8.287292	75000	1401000	0.70614919	555000	0.084180	405000	2755999.8
1992	17.9608127	494999.964	33.01886	910000	8.241758	75000	1405000	0.700049825	560000	0.083308	462879	2755999.8

Table 7. Land-Use Allocations in Haiti (1960-1996) cont.

Year	Land use permanent pasture (% of land area)	Permanent pasture (hectares)	Land use cropland (% of land area)	Cropland (hectares)	Irrigated land (% of crop land)	Irrigated land (hectares)	Agricultural land (hectares)	Agricultural land per worker (hectares)	Arable land (hectares)	Arable land (hectares per person)	Area under cereal production (hectares)	Total land (hectares)
1993	17.9608127	494999.964	33.01886	909999.999	8.791208	80000	1405000	0.692118227	560000	0.081625	435000	2755999.8
1994	17.9608127	494999.964	33.01886	910000.004	9.340659	85000	1405000	0.684031158	560000	0.079896	433000	2755999.8
1995	.	.	33.01886	910000	9.890109	90000	.	.	560000	0.078125	407000	2755999.8
1996	.	.	.	.	.	.	.	.	.	.	423200	2755999.8
Averages	20.0044795	551323.415	30.64897	854671.584	7.535058	64400	1394088.23	0.734636316	520085.7	0.100078	437659.5	2755999.8

Table 8. Haitian Import and Export Trends (1960-1996)

Year	Imports of goods and services (constant 1987 US100 31 22 100)	Agricultural raw materials (% of merchandise imports)	Food imports (% of merchandise imports)	Manufacturers imports (% of merchandise imports)	Exports of goods and services (constant 1987 US100 31 22 100)	Exports as a capacity to import (constant LCU)	Exports as a capacity to import (constant 1987 US100 31 22 100)	Agricultural raw material exports (% of merchandise exports)	Food exports (% of merchandise exports)	Manufactures exports (% of merchandise exports)	Ores and metals exports (% of merchandise exports)
1960	.	.	.	.	.	791299924	.	.	.	.	.
1961	.	.	.	.	.	664034117	.	.	.	.	.
1962	.	.	.	.	.	676164398	.	.	.	.	.
1963	.	.	.	.	.	853209295	.	.	.	.	.
1964	.	.	.	.	.	708988723	.	.	.	.	.
1965	.	.	.	.	.	705772907	.	.	.	.	.
1966	157198732	.	.	.	108029003	695504459	115617132	.	.	.	.
1967	128304435	4.171659	31.08419	55.69709	104280363	587640240	97686332	7.40985899	55.04007127	21.35175178	14.11572569
1968	150319138	1.590788	24.92800	61.87134	126090634	781087119	129843959	5.4079306	57.71928107	21.841527	14.75347626
1969	156166793	1.476189	27.88561	59.26690	130520846	762699688	126787326	8.121064	49.4081522	19.9150745	21.36235043
1970	202604055	1.737875	20.81485	68.28406	140403625	949881298	157903448	5.764537	51.70608663	23.67616316	16.905128
1971	225650697	2.497087	24.10655	62.54047	167325679	1085578716	180461098	2.4433128	53.74251497	25.6833977	16.41336441
1972	248697338	2.018853	25.56429	61.85687	177208459	1070939802	178027599	2.494859	51.66449996	27.3465384	16.70645519
1973	258672750	3.403864	24.93549	62.55762	207879154	1128753559	187638264	3.95564902	52.55774339	28.16723804	12.949215
1974	279655513	3.577825	24.01903	56.14437	221169788	1057225294	175747769	8.067491715	45.02405612	34.96352329	9.7491771
1975	297026500	3.335705	28.72268	53.98833	222907784	1143933655	190161727	4.951169517	42.27852592	37.88772438	12.9546138
1976	387837146	3.136367	30.89685	52.77687	250988509	1523994251	253341072	2.228550425	44.57185933	35.47779447	15.6172096
1977	439778062	2.837850	27.83855	56.39488	247716968	1780072052	295910146	1.624733008	50.77695369	32.62626326	12.174612
1978	452333355	3.869159	25.62539	57.84312	271878671	1895980653	315178204	1.837332759	48.35317003	36.77546968	10.93277164
1979	444043411	2.601957	23.56844	59.64095	304594079	1770000561	294235913	1.086891328	35.70762839	47.94742109	12.1914729
1980	530863892	1.106867	21.54297	61.80960	386109948	2263851502	376331187	1.131266915	31.42709749	62.85674515	3.697749367
1981	523605953	4.867257	26.10287	58.72482	293961571	1654074902	274965019	0.850821602	29.50533888	68.25810847	0.143692265
1982	577856628	1.624082	22.71407	66.87908	360687372	1896538106	315270872	0.672684496	23.71067385	69.22425219	4.759575729
1983	480195690	1.400599	19.25628	72.56921	326506575	1811821147	301187955	0.466219894	24.53533593	71.74011666	0.114790238
1984	476067934	.	.	.	346578852	1887413685	313754074	.	.	.	.
Year	Imports of goods and services (constant 1987 US100	Agricultural raw materials (% of merchand	Food imports (% of merchand ise	Manufacturers imports (% of merchandise imports)	Exports of goods and services (constant 1987 US100	Exports as a capacity to import (constant LCU)	Exports as a capacity to import (constant 1987 US100 31 22	Agricultural raw material exports (% of merchandise exports)	Food exports (% of merchandise exports)	Manufactures exports (% of merchandise exports)	Ores and metals exports (% of merchandise exports)

	31 22 100)	ise imports)	imports)		31 22 100)		100)				
1986	522161216	.	.	.	340103927	2036914229	338606287	.	.	.	.
1988	514249705	.	.	.	344874924	1973922338	328134834	1.788080573	22.07265396	72.68356483	0.012773591
1989	552087430	.	.	.	351009063	2048257522	340491938	2.615075139	27.11861844	67.6064634	0.166186776
1990	746091993	.	.	.	443021148	2456073542	408285204	0.601186243	13.87415355	85.38445939	0.114954149
1991	846883831	.	.	.	394976949	2207528313	366968306	2.483934474	14.59444738	82.39922872	0.09155938
1992	466787672	.	.	.	206856419	1073139450	178393257	.	.	.	.
1993	748506002	.	.	.	280809874	1476038196	245369100	.	.	.	.
1994	510474211	.	.	.	182998624	961100000	159768388	.	.	.	.
1995	1388859561	.	.	.	342558344	1609191118	267503767	.	.	.	.
1996	1546716246	.	.	.	413636677	2236424138	371771801	.	.	.	.
Averages	496074772.3	2.661999	25.27095	60.52033	270201047	1409047398	255976499	3.142983309	39.30423155	46.37203931	9.329850167

Table 8. Haitian Import and Export Trends (1960-1996) cont.

Table 9. Organic Water Pollution Sources and Percentages in Haiti (1975-1988, 1994)

Year	Safe water rural (% of rural pop with access)	Safe water urban (% of urban pop with access)	Organic water pollutant (BOD) emissions (kg per day)	Organic water pollutant (BOD) emissions (kg per day per worker)	Water pollution chemical industry (% of BOD emissions)	Water pollution clay and glass industry (% of BOD emissions)	Water pollution food industry (% of BOD emissions)	Water pollution metal industry (% of BOD emissions)	Water pollution other industry (% of BOD emissions)	Water pollution paper and pulp industry (% of BOD emissions)	Water pollution textile industry (% of BOD emissions)	Water pollution wood industry (% of BOD emissions)
1975	3	46	3738.957	0.2133	2.097	0.09978	76.464896	.	1.886356	0.06752293	18.5119357	0.264761
1976	.	.	3678.455	0.1975	2.279	0.15573	72.6859048	.	2.228698	1.35122567	20.8243012	0.4751275
1977	.	.	4000.328	0.1869	1.805	0.13034	69.74346	.	2.35708139	.	24.9444138	0.24063524
1978	.	.	3796.587	0.1792	2.215	0.10387	68.4149	.	2.73034691	2.70148017	23.5324123	0.30210061
1979	.	.	4917.831	0.2082	2.3955	0.10991	72.54893	.	2.15223837	1.49999513	20.1814789	1.1197399
1980	.	.	4733.779	0.1881	2.1721	0.12877	70.976237	.	2.82708982	2.2666412	20.5446550	1.08454005
1981	.	.	4617.741	0.1791	2.5259	0.12102	71.530566	1.676484	2.461962	2.5029947	18.4077721	0.77322852
1982	.	.	4776.853	0.17095	5.504	0.12299	67.237217	2.638086	3.51972945	.	21.6466714	0.7374687
1983	.	.	5068.741	0.1646	2.5382	0.13735	68.2567755	2.08893	3.6357843	4.0313592	18.5815636	0.77300202
1984	.	.	5136.000	0.1812	2.07317	0.12068	68.5918675	2.061574	4.0295972	2.7496652	19.328744	1.08069019
1985	32	59	5313.929	0.18277	1.7283	0.12742	69.260427	1.992545	3.60513377	3.20693262	19.331497	0.74772679
1986	.	.	5695.204	0.17837	1.8439	0.15306	67.83691	1.981062	3.52632399	3.19310698	20.7355392	0.73003503
1987	.	.	5594.361	0.1915	1.9696	0.1272	69.8146187	1.799582	3.40026503	3.20130623	19.0882776	0.599193
1988	35	51	5426.976	0.1962	2.0636	0.14669	69.474440	1.951039	2.7903222	3.53991572	19.1911150	0.8428545
1994	23	37	.	.	.	.	.	.	.	.	.	.
Averages	23.25	48.25	4749.696	0.186992	2.3721621	0.1274864	70.202653	2.023663	2.93935203	2.52601214	20.3464555	0.6979359

Table 10. Water and Forest Resources in Haiti (Data Collection is from varying years)

Annual Internal renewable water resources Total (cubic km)		1998 Internal Renewable water resources per capita (cubic meters)	Annual Withdrawals year of data	Annual withdrawals total (cubic km)	Annual withdrawals percentage of water resources	Annual withdrawals per capita (cubic meters)	Sectoral withdrawals percent domestic	Sectoral withdrawals percent industrial	Sectoral withdrawals percent agricultural		Annual groundwater recharge Total (cubic km)		1998 Groundwater recharge per capita (cubic meters)
11.0		1460.0	1987	0.0	0.4	6.6	24	8	68	a	2.5	b	331.8
Land Area (1994) ha	Original forest area (8000 ya) ha	Original Forest as a % of Land area	Current forest area ha	Current forest as a percent of original forest									
2756000	2400832	93.2	19206.7	0.8									

a. Sectoral withdrawal estimates are for 1987

b. Sum of all groundwater flows (as a constituent of surface water flows)

(*World Resources Indicators, 1998*)

Appendix III: Haitian/Cuban Exchange Program Initiative⁵⁰

GLOBAL EXCHANGE PRESENTS REALITY TOURS. . .

Cuba and Haiti

May 24 - June 7, 2001

An Exploration of South-South Cooperation in Sustainable Agriculture

Agricultural Comparative Study Delegation:

Until 1989, Cuba's agriculture was the most industrialized agriculture in Latin America, largely based on chemical fertilizers and pesticides. Due to the collapse of the Soviet Union and the US trade embargo, creative Cuban farmers have turned to a variety of traditional, alternative, and renewable technologies to produce food, medicine and, energy. Ox driven plows have taken the place of tractors, organic composting and pest control techniques have replaced chemical fertilizers and pesticides. The changes incurred by this sustainable model of development have been attributed to a community of scientists with a no profit motive and unprecedented government and community support. We will learn how an estimated 30,000 organic urban gardens in Havana are providing over 40% of residents' food necessities, in addition to the 1,000,000 urban gardens throughout the country. Today, Cuba's low impact agricultural system and vast implementation of alternative energy sources are pioneering a sustainable habitat for the world.

Years of dictatorship and political repression have left Haiti in an ecological and economic crisis. Deforestation, desertification, and erosion threaten the food security of Cuba's closest neighbor. World Bank and IMF imposed austerity programs have put a strangle on Haiti's government. Forced to lower tariffs, Haiti's rice growers can no longer compete with cheaper American grown rice. However, through the resilience of the people, peasant movements across the country have made bold moves to reclaim the land and Haiti's natural resources. In addition, an exciting new partnership with Haiti's Cuban neighbors has resulted in innovative projects designed to restore sustainability to Haiti's agricultural sector. Contrary to US funded aid projects, Cuban agronomists and veterinarians have been working directly with the Haitian peasantry in erosion prevention, irrigation, and animal husbandry. Working together, Cuba and Haiti are creating viable alternatives for sustainable development.

⁵⁰ This Appendix is a copy of an email I received through the Corbettelist. While I was in Fondwa, they were beginning to discuss the possibilities of setting up a small-scale ecotourism industry that included Fondwa, APF and Cuba. Personally, I have some hesitations concerning appealing to tourism in a region such as Fondwa, particularly because it often leads to greater environmental destruction. Their plan, however, was to be sure to keep the scale of tourism at a minimum in order to retain the integrity of the small community.

Why Join this Delegation?

This educational and fact-finding delegation will trace sustainable agriculture through various levels of design, research, and implementation.

We will explore successful and innovative techniques for sustainable and organic agriculture; and learn to appreciate the unique and multitiered relationships fostered by a commitment to safe, healthy ecosystems. Haiti and Cuba constitute vital educational resources for scientists, hunger activists, and green thumbs around the world. We will learn about an innovative partnership that has developed between these two countries, an excellent model of south-south cooperation. We invite you to help chart our course by providing us with your special interests and program suggestions, which makes the trip evolve into something meaningful and intimate.

Program Highlights:

- . In Haiti, stay with the dynamic community members of Milot, meet the leaders of the local peasant movement, learn about their recent controversial land reform.
- . Observe grassroots organizations working effectively in reforestation and animal husbandry specifically adapted to their unique resources and environment.
- . Talk to peasant activist groups about the hardships, as well as the successes of the Haiti's nationwide peasant movement.
- . Meet with the innovators of the Cuban-Haitian partnership, discover first hand the strength and the benefits of international south-south collaboration and exchange.
- . Witness the transformation of Havana into a viable organic marketplace.
- . Visit Cuba's Institute for Basic Research in Tropical Agriculture, the second-oldest such institute in the Americas.
- . Travel outside of Havana to visit Cuba's successful reforestation projects and agricultural cooperatives.

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Appendix IV: ‘Invisible Boundaries, visible attributes’: Haitian Women in New York City⁵¹

As I began to think about topics related to women, Haiti and migration, I was drawn particularly to New York City--a place where millions of nationalities feel at home, yet which remains strange and unfamiliar to most. I wanted to explore not only the issue of being deemed an “immigrant” in New York City, but also to explore the roles of the black woman in a city--and a country--that has a strict history of racial and gender divisions.⁵²

I have personally experienced social stereotyping and have been confronted with assumptions concerning my capabilities and personality based upon my physical appearance and the sex that I decisively represent--woman. For many, ‘woman’ is associated with weakness, domesticity and ever-flowing reproduction. Simultaneously, women are expected to remain strong and resilient in the face of diversity, as well as remain emotionally and spiritually silent when called into question. I do not mean to say that women haven’t gained great steps in the genre of political, social and economic equality, however, I know from personal experience that *policy* changes faster than *ideology*. Women are confronted with—often not so subtle—statements, laws and ideologies that reflect upon how she sees herself as an intellectual, as a physical body, and as a capable member of society.

In addition to gender issues, the complexities of race and of the stigmatization of the ‘foreigner’ in much of American society create a ‘bound’ environment for many Haitian women migrants. In this paper, I would like to explore the positions of these women in New York society. Particularly drawing on an interview I had with a Haitian migrant living in Brooklyn, I would like to see how many preexisting social boundaries and hierarchies—both in Haiti and in the US--are translating into questions of ‘assimilation’ or ‘differentiation’ in the woman’s everyday life. Likewise, I would like to see how distinctive, complex Haitian heritages are often retained in, transformed from, and translated to the New York City landscape.

As I mentioned before, there are ‘boundaries’ or ‘borders’ inherent in discussions of immigration and particularly in the situations of minorities and women in America. We are a country who both prides itself in its diversity and individuality, and whom also struggles to create the collective “American Identity”. In this paper, I would like to present some of my observations about where these boundaries are being placed through the analysis Haitian women’s roles in New York’s

⁵¹ This paper was written for an independent project in my Anthropology course, Kinship Global and Local

private and public spheres. Additionally, I would like to point to some ways these ‘borders’ are--and may continue to be--redrawn to accommodate an ever-changing American population and ideology.

Haiti, Women and New York City

Identity is something that is always fluid and is always a fiction. But for me what it means when I say I'm Haitian is that it's a place that I have allegiance to. It's probably the first place I have allegiance to, even though I'm not doing anything for Haiti right now. This is the place that's made me. This is the place that made me who I am and this is the place where my people come from. This is where my roots are. You know, before my mother's generation, people never left Haiti. In other words, people were born there and die there. I was not born in Haiti and I might not die there, but before me, everyone, maybe for five or six generations never left Haiti. So, it means that I'm a kreyol speaker, it means that I have a certain sense of humor, increasingly in the past couple years, it means that I see the world with a certain amount of pessimism--Or at least with this notion that human nature is not always benevolent. It's always meant that socially I don't really get along, although I will not hesitate to call myself black and black American and I am willing to take on issues in the black-American community as my own, socially, with Black-America (excerpt from interview with 'Sara').

I have been working on and researching various facets of Haitian culture for the past year-and-a half now. Throughout all of my research, I have been aching to ask, ‘What about in the U.S? How is it to be Haitian in my own country? How are my ideas of ‘American’ translated to immigrants coming from Haiti?’ We live in a country that was founded upon immigration and diversity yet, at the same time, our policies and ideologies have not always reflected the ‘open arms’ and freedom associated with our famous green woman planted brilliantly in the midst of Hudson River, spreading across the New York City skyline-- the Statue of Liberty.

Why did I chose *New York* and why Haitian *women* in particular? I chose New York as my site for two main reasons. According to the U.S. Department of Commerce 1990 national census, 87% of Haitians in the U.S. live in New York, Florida Massachusetts or New Jersey. Of the 292,036 people claiming Haiti as their primary ancestry in the 1990 census, 108,696 resided in New York and 104, 472 lived in Florida. Of the population n New York, 25% of Haitian Americans were naturalized citizens and 45% were not U.S. citizens. The remaining percentages were born in the U.S.

⁵² I don't know of many--if any--countries without a history of strict gender and racial divisions.

Undeniably, there is a very strong Haitian community in New York City, which not only combines the dynamic structures of one of the most complex cities in the world, but also indicates a strong solidarity among Haitians and Haitian-Americans in New York City. Secondly, I chose New York City for personal reasons. I have both a lot of experience with the city and am also thinking of living there and possibly working with Haitian social and political groups after I graduate. For these reasons alone, I find it important to better understand where and why people are moving from Haiti to the U.S. and to try to find out where they are ending up the social, political and economic hierarchy of our own country. Understanding why certain nationalities, genders and races are being placed in specific roles may very well help understand issues such as these facing our country and our society.

Why I chose to look at the Haitian *women* specifically? The primary reason is that, according to the 1992 World Development Report, of the 234,757 emigrants from Haiti in 1990, 53% were women and of the 292,036 of Haitian Diaspora in the U.S., 51% are women. This means that women are not only the majority who leave Haiti, but Haitian women are also the majority of Haitian Americans. Although the difference in numbers is not overwhelming, the fact that Haitian women are the majority of emigrants is a very significant one. It is both reflective of the roles that Haitian women have in Haiti and the ones that they are assuming by moving across national borders. Additionally, as a woman I am very interested in looking at cross-cultural gender roles and seeing how expectations and traditions relating to the role, treatment, and status of women in other societies are transforming the role of these women in American society and how these attributes are being translated from Haitian to American culture.

Sara's Story

To begin with, upon the request of my interviewee, all names included in this paper are substitutions for their real names. This is to ensure the privacy of those I spoke with.

I met Sara through a Haitian news discussion group that I have taken part in periodically. I was looking for Haitian women in New York City who would be willing to share their stories and their thoughts about being a Haitian woman in the U.S, and more specifically in New York. At the beginning of our interview, Sara told me that she thought her experiences in New York were probably

different from those of most Haitian women. She explained to me that she had come for her college education and that New York had been a choice for her because that's where her family already had made ties with the U.S. In this sense, Sara was right. According to the 1990 U.S. Census, only 25% of the Haitian population in the U.S. had more than a high school degree, with 60% having less than a high school degree. Based on Catanese's comparison of Haitian-American immigrants versus other immigrants, the ration of Haitians to other immigrants with more that a high school degree was 0.57. This indicated that far fewer Haitian-Americans are gaining degrees of higher education than other U.S. immigrants. In regards to Sara's experience, she had already attended college in the U.S. and had now returned for law school. Although her educational background and close knit experiences may be outliers from the national statistics of Haitian women and their roles in New York, Sara's story is both informative and reflective of many aspects of female Haitianity in the City.

Right now I am a law student in New York, I came from Port-au-Prince. My mom still lives there and so does my little sister. But really, my family to me is not just my nuclear family. So, my aunt is also my family, my mom's sister, and they work together and they're both still living there. My mom calls me and we usually just talk about her personal situation. Really, I'm at a point where I'm a little fed up. I mean my sister is really into this stuff [Haitian politics and current situation], she's the one that really updates me. I guess it's just denial slash avoidance, I 'm just really sad about it and I just don't want to deal with it a lot of the time.

I live in Brooklyn, but I don't live in a part of it that is terribly Haitian. I now know two other Haitian women here. I mean, I know my sister, I know my relatives; I think those are the Haitians that I interface with the most. It's not very many people-- my sister, she and I are very close, my cousin, my aunt's daughter, my aunt, and my other aunt on my dad's side are close too. And here and there, like in law school, there are two Haitian women that I know. I think that my experience is probably very different from most Haitian women who are in New York because I'm assuming that there are usually bigger Haitian networks. I've been here for eight years now. I went to college here, then took a break, then came back. Before that, I lived in Haiti since I was five. Before that, my parents had left Haiti and lived abroad and when they came back I was five years old.

My parents both studied in Europe. My mom didn't finish, but she studied medicine and my father was a pediatrician in Europe. My parents come from two very different backgrounds, not economically, but my mother is a very, very light skinned Haitian and my father is a very dark skinned Haitian. Now it's probably not a big issue now, but back then it was and that informed the fact that they chose to live abroad before coming back to Haiti. By the time we moved back to Haiti it was because my father had passed away. We lived in Africa before then, we lived in Congo. I'm finding out more and more about my dad's family now because I grew up mainly with my mother's family.

I'm sure it's not just a Haitian monopoly, but there's a lot of hiding in Haitian families and that's why I think I'm finding things out right now.

Sara's explanation of the 'different backgrounds' of her parents due to the darkness of their skin is a very interesting one. Although there are intense racial delineations in Haiti—a country deemed the 'First Black Republic'—Sara clearly felt that race was, today, more of a defining characteristic of the individual in New York than in Haiti. This concept of racial boundaries is something I will explore later in the following section, Invisible Boundaries, Visible attributes. Here, I would like to discuss Sara's parents' experience as being from different backgrounds due to their skin color and see how this has translated over to Sara living in New York. This brings into view some of the historical results of migration within Haiti in relation to the creation of racial and social hierarchy.

Invisible Boundaries, Visible Attributes

During the early part of the postcolonial period in Haiti, there was a great redistribution of land coupled with mass migration and the decentralization of power from urban centers to rural areas. Subsequently, in the beginning of the 20th century, a different form of migration began to occur. This was one where a substantial number of rural poor began to emigrate to Cuba and the Dominican Republic to work on sugar cane plantations. These emigrants were blacks and those who stayed at home in Haitian cities were mulattos. It was during this period, that the urban, mulatto began to emerge as national leaders and powerful figures (Catanese, 20). The 'elite' racial boundaries did not necessarily begin after freedom, however. Under French colonial rule, many mulattos were given privilege over the black slaves of St. Domingue (Haiti). However, the racial/class tensions that began to emerge from the emigration of black labor in the turn of the 20th century set in motion the strict divisions that were to be set between power, class, race and the rural/urban population. Additionally, this trend of a growing urban elite is neither isolated to historical transformations, nor to Haiti. According to a United Nations Human-development report, the gaps between the rich and the poor within and between countries are at an all-time high.

An emerging global elite, mostly urban-based and interconnected in a variety of ways, is amassing great wealth and power, while more than half of humanity is left out (Ong: 11).

However, Haiti's situation is a primary example of some of the complex struggles between class, race, power and social structure. Although there have been many political and social changes in Haiti since the early 20th century—including the 'noiriste' regime of Papa Doc⁵³--as is evident with Sara's parents' experience, racial tensions still remain in regards to marriage. According to Sara, there are still many existing ideologies about race that continue to haunt Haitian migrants in the U.S. that she knows.

I dated a man who I probably wouldn't have dated in Haiti and it actually went sour. You know, a lot of people get over certain things. Even though he was living in Boston and is doing very well. His thing is, even though he's made it here, if he went back to Haiti, in his eyes, he could never be perceived as having made it because he doesn't speak French, because he's dark skinned. Actually, I think he's wrong, when he focuses on being dark-skinned. When I think it's a class issue, not race so much. Because there are plenty of dark-skinned males doing just fine, I mean Haiti is a black country. Worst of all, he obviously hadn't gotten over a lot of issues from childhood, where his dignity was never acknowledged. I mean when you have people telling children, of all classes, that 'you know, you're too dark-skinned you'll never make it. You're nothing'. But you look at the situation of these children that are taken in almost as slaves in these middle class families-- what happens is the abject poverty, the lack of resources makes it so that all that people have control over is other people and, all the people have power over other people. Maybe [I see] this because I grew up in an urban setting. Maybe if I had had more exposure to rural Haiti [I would have a different perspective]. Maybe if I start talking to Haitians who grew up in rural settings, where they were poor, but not hungry, or where nature is more prevalent, it would be different.

Sara's example here brings up many complex issues about class relations, relationships, and personal dignity in relation to race. I am particularly interested in what she has to say about 'resources' and--in turn--how race, a visibly obvious attribute, creates invisible social, political and economic boundaries and directly relates to issues of power and human capital. According to Aiwa Ong's analysis of cultural capital within corporations, racial origin, kinship bonds, historical solidarity and economic relations create tremendous bonds both internal and external to the nation-state. (Ong:66). In many ways, these racial and historical ties are being used, and often exploited, much like the 'resources' to which Sara refers. According to Sara, it is the intense lack of dignity that is so

⁵³ The 30-year dictatorship of Papa Doc, followed by Baby Doc, Duvalier's son, was wrought with racial tensions and movements towards increasing the power of the black majority of Haiti. However, this period was also a time of great corruption and social and political oppression, as well as a period of gross human rights violations.

crucial to the perspective of Haitians both in Haiti and abroad. By retaining the racial hierarchies that he perceives in Haiti, her Haitian American friend is, in many ways, adhering to the very ideas with which he disagrees. In other words, although society has created borders for him, Sara's friend is continuing the anger and frustration associated with the Haitian social structure and translating it to his life in Boston.

Contrary to Sara's friend's story, there are many examples of Haitian immigrants who feel that their cultural capital will increase, rather than decrease upon their return to Haiti. Nina Schiller brings up a primary example of a Haitian woman in New York who realizes her elevated significance in Haiti, as opposed to her situation in the U.S.

In the United States, Yvette may be just another ageing black woman, but in Haiti she is a somebody. IN the United States her earning make no social mark, even if she were to hoard them or spend them on consumer goods. But to the extensive network of people she has been supporting in Haiti, Yvette is a person of substance. On her two trips back home, she was treated as a visiting dignitary (Schiller: 347).

The reason for the disparities between these two cases may, in fact, be due to what Sara had deemed as reasons of 'social class', or because of rural/urban differences in positioning within Haitian social hierarchies. Sara's friend was from Port-au-Prince, where racial and class boundaries are much more apparent; In Schiller's example, Yvette is from a rural area of Haiti where more of the population are of the same class background and are removed from the intense politics of Port-au-Prince.

The ties that Sara draws between poverty, power and racial/class divisions in Haiti are very important and insightful. As Aiwa Ong discusses the ties between cultural and social capital to racial identity, she makes an interesting point about the value given to certain cultural capitals in a country and the role of the immigrant.

Indeed, the reproduction of social power, especially for the newcomer deploying start-up symbolic capital, is never guaranteed or certain, especially when he or she embodies other signs—for example, skin color, foreign accent, and cultural taste—that may count as symbolic deficits in the host society. Thus, in transnational movements, newcomers may have acquired cultural capital that they have difficulty converting into social capital because there is a perceived mismatch between the distinction of their

symbolic capital and their racial identity, which may be associated with low social value in the host group (Ong: 91).

The links that Sara makes between the lack of ‘natural resources’ and the subsequent substitution of ‘human resources’ is reflective of this lack of dignity and the inherent instability of being an immigrant. Interestingly enough, Sara’s friend believes that he would not be able to ‘reproduce the social power’ that he has obtained in the U.S.—which is due to his economic status, the education that he has received, etc—upon return to Haiti due to the already existing ‘invisible boundaries’ associated with race and class. In this way, it seems that the black Haitian immigrant is not only having to face questions of coming to the U.S. and overcoming the symbolic capital issues of our country, but at the same time has to worry if, upon return to Haiti, the accumulation of symbolic capital in the U.S. is transferable to the existing structures in Haiti. The example here was of a black Haitian male who is now in the U.S., however, Haitian women have not only these issues of class, race and social hierarchy to overcome, but they are also faced with the complexities of gender relations and roles. For the Haitian woman immigrant, she is not only victim to the ‘abstract’ boundaries of both Haitian and American society, but she is also subject to the greater cultural issues concerning womanhood.

Who’s Coming and Why New York?

Why I chose New York? Because that’s where my link to the states was. I mean if my links had been in Florida, I would have probably gone to Florida, you know but most of my family came to New York. Actually, most of them [my family] came in the sixties...See how I use the word ‘family’, I don’t mean the American family, my family is everyone of my relatives, so that gives you a sense of the Haitian family. Most of the came in the late fifties and early sixties and actually weren’t able to get an education, to get degrees, and then they came to work in union jobs or not so unionized jobs. Back then they came to work. Those of my relatives who are migrating now, in other words, my cousins, my brother, my sister, then me and then my younger cousin, then her brother and then my other cousin, all of the ones who are coming now are coming to get degrees. Some of them, their parents were here. Like my cousin, who’s mother was here in the sixties, well she might have gotten a certificate, but no body got a college degree back then. Some left, some stayed on. Her mother went back to Haiti and ended up working with my mother and they’re both educators. And now her daughter came back, but her daughter came back to get a degree.

Sara's experience of coming to New York due to family ties there is not an unusual one. According to Nina Schiller's analysis of Haitian transnational social fields,

"The largest Haitian settlements in the United States are in south Florida and the New York metropolitan area. New York City was the initial location of settlement for most Haitian immigrants and in 1994, 30% of the newly arrived legal immigrants continued to settle there (US Immigration and Naturalization Service 1996) (Schiller, 346)."

Accordingly, although many think that the initial rush of migration was with the Duvalier regime and those Haitians seeking political refuge, there were—and still remain—many economic factors contributing to the rural/urban and transnational migration of Haitians. According to the 1990 U.S. Census, 70% of Haitian emigrants in the U.S. are 40 years of age or younger—which means that women are predominantly of child-bearing age—and 56% of Haitian immigrants have never been married. The remaining 44% of Haitian Americans are married, widowed, divorced or separated. The statistics on marriage are important in that this indicates women's social status and 'availability' to 'foreign' relationships abroad. Another interesting fact about who is coming to the U.S. is that there were nearly 100,000 of the near 300,000 Haitian Americans reported were between the ages of 0 and 20. This indicates that not only women—who are 51% of migrants—are coming to the U.S., but that many of them are either bringing their children with them, or are having children once in the U.S. This is important in understanding how the Haitian woman is able to 'fit' into New York's social and economic structures. According to Shellee Collens analysis of English-speaking Caribbean women immigrants in childcare positions in New York, often women with children are not as desirable as 'unattached' women. The reasons she provided were due to their availability for working overtime, feelings of caring just for the employees' children, and the lack of personal obligation (Rapp, 80). Additionally, the role of these women in the labor force—as caretakers—is feeding to constraints and preconceived notions of gender-defined obligations. Continuing, almost half (49%) of all Haitian Americans reported no earnings, which includes those excluded from the labor force due to their age. I will go into stratification of labor within the New York landscape more in the section concerning the economic positioning of Haitian women.

The above statistics show that there exists a diversity of age groups throughout Haitian Americans in the U.S. This indicates that the migration patterns are not solely based on individual

movement, but are part of a greater networking, familial movement of Haitians to ‘hotspots’ in the U.S., including New York City. Sara’s example of her family and her reasons for choosing New York are reflective of this concept. Even though she was coming to the U.S. specifically for an education, she nevertheless chose New York City because of her kinship ties there.

In the next section, while continuing my discussion of labor and the position of Haitian women in New York, I will discuss some of the connections being made and maintained between the immigrant, Haiti and their kin in both America and Haiti.

Roots and Perspective

My ties to Haiti are very strong. Where all of my family living outside of Haiti, I’m trying to think of what my ties would be like. They wouldn’t be probably as strong, but they would still be strong. Because no matter what, whenever I’m asked, even though I’m now a naturalized American, I say I’m Haitian. I don’t even say Haitian-American; I say I’m Haitian. You know I lived there from five to eighteen, that’s a long time. And my parents live there, and I keep on finding out a lot of stuff. I’m getting a lot of perspective on my family and I found out more and more stuff about my family, on both sides of my family, now that I’m here. It’s two things, one I’m coming of age, I’m twenty-six, in a way, it’s sort of like I’m coming into my own as a woman and I’m developing my personality and I’m finding my past. So, now more than ever, I appreciate their struggles. Now more than ever I appreciate where they came from; I think I understand a lot of things more. My ties are still strong. Being a Haitian defines me. I think the fact that I have family there keeps me in tune. My mother comes and visits me a lot and I go pretty much every year. And it’s interesting too, because my mom’s household is changing a lot too. For example, my grandmother used to live with us and she died. And there are ties as a family that we had to certain people that have severed for a variety of reasons, we had a maid that was there for all of my life and she left.

According to Schiller, Haitian Diaspora is very strong and closely knit to Haiti as a ‘homeland’. It is through the continuing home ties that involve migrants in Haiti, which connect individual life strategies and daily decisions with broad, international politics and relations across borders (Schiller, 341). Sara’s comments about her roots and her family show the intense identification that she maintains—despite her naturalization as an American—with both her family and her country. At the same time, Sara acknowledges that her perspective of kinship relations and family have changed since she immigrated to the US.

I've also become more interested in Haiti because, when I was twelve, Baby Doc was in control. I was very young when there was a surge of hope and now, it's over thirteen years and things have gotten worse. Things have gone back to how they were. So there's the question, Why is it that things never change in Haiti? There's really pessimism there. Any Haitian literature I've read, it always sounds harsh and pessimistic and now I understand why. That's why I'm saying there's a lot I'm understanding now, not just about my family, but about Haiti in general. I think it's because I was in this little bubble. We grew up in a relatively middle-class family, we weren't rich, but we were middle class. And those were the type of things I never understood--the broader realities of Haiti-- like hunger. I mean just constant instability, constant insecurity--no safety. Compared to that, I was in a bubble. I never understood the pessimism, but now that I understand Haiti better, all of its complexities and all of its' realities, I understand why the literature is so pessimistic. It's actually fatalist, not all of it, but there were pieces I understood. And it's [the pessimism/fatalism] because of the abject poverty, the abject hunger, because of the constant hunger, because of the denial of fundamental dignity. There is no concept of fundamental dignity. I think Aristede is the first one to actually have brought that about in the national language with the book that he wrote. Human rights aren't understood in Haiti. Now human rights are a concept, 'up in the air', but individual dignity is not understood. [I am able to see this because] Now that I am outside, I have the opportunity to meet with Haitians from different class backgrounds, with whom I would never have mingled when I was in Haiti, and I see their anger.

Through Sara's experiences in the U.S., she claims that she has been able to reach a greater perspective of both her family and of Haiti as a whole. Interestingly, by being in New York, it is Sara's exposure to differing classes and to rural Haitians, which she would not have in Port-au-Prince, has allowed her to understand more about her own country. And in many ways, Sara's exposure across social boundaries has made her more curious about the boundaries within her own family. In this way, the spatial separation from the realities of Haiti and her life there, are allowing Sara to better understand the social structures of which she is a part. The pessimism that Sara talks about is not necessarily isolated to Haitians in Haiti. Although Sara lives a 'middle class life', the majority of Haitians in the United States have considerably lower than average incomes and are subject to intensive structures of labor stratification.

Stratification of Labor: Haiti and New York

According to a gender and poverty report by Maria Correia, Haitian women have proven to be key to sustaining their families in times of economic hardships and decline. Additionally, much

research indicates that women carry a heavier familial burden than men in regards to family maintenance. In Haiti, the domination of women in the ‘informal’ labor sector is reflective of these responsibilities. In addition to this, the family structures in Haiti—where there are many informal unions and some prevalence of polygamy—have created a situation where men are not legally or otherwise bound to their children. This results in a situation where Haitian women are paying a disproportionate share of child maintenance costs, a situation that is common in Haiti. In Haiti, women are the main providers of water and fuel to the family and they often play key roles in agriculture as well. According to official data of the Haitian Ministry of Women (MOW), women’s roles in marketing and trading have been steadily increasing from 20 to 30 percent in the past few decades (men are 2-6%). Women are also the predominant workers in factories in Haiti.

Factory owners and managers indicate a preference for female workers because of their perceived greater manual dexterity, their more docile and less militant nature and the labor supply of women in Port-au-Prince, where they outnumber men by 30 percent (Correia, no pages noted).

However, these numbers are reflective of women in the ‘formal’, or reported labor sector. In Haiti, much of commodity flow is attributed to the workings of the ‘informal’ labor sector including markets, in which women are the predominant laborers. Labor stratification also plays a key role in the migration of women. According to Plotkin,

While little is known about the gender-specific push and pull factors of migration in Haiti, the predominance of women in rural-urban flows has been attributed to their limited rural employment opportunities and the fact that available urban employment in small scale commerce and domestic service are activities typically associated with women. Also, women are preferred for assembly work in urban-based manufacturing (Plotkin: 1984b).

In terms of labor stratification and the international migration of Haitian women, some women are faced with exasperated economic and racial exploitations abroad due to the fact that women have fewer rights than men. In the Dominican Republic, Haitian women are not allowed to work in the sugar-cane fields and are not eligible for health care, housing, or other social services. One question

that I would like to ask is how these ideas of Haitian women and their role in Haiti are translating to stratified reproduction⁵⁴ and labor in New York City.

Although I was not able to find data reflecting the census statistics of Haitian women in the labor force in New York City, I would like to look at the national data for employment of Haitians in the U.S. According to the 1990 Census, of the Haitian Americans with jobs, 74% were making less than \$20,000 per year (see table 1). If one looks at this number, and figure in the fact that the majority of Haitians who are coming to the US are single, women and that many of them have children, then this places the average Haitian woman in or below the poverty line. Just looking at the cost of housing in New York, or Brooklyn (much of the Haitian population in New York is in Brooklyn)—it’s difficult to find a one bedroom efficiency for less than \$600/mo—shows how little a salary of \$20,000 provides for. In addition to this, many Haitians in New York send money and goods regularly to friends and family in Haiti (Schiller).

Table 1. Earnings of Haitian Americans with Jobs

	Number	Percent
Less than \$10,000	49,019	33%
\$10,000-\$19,999	60,244	41%
\$20,000-\$29,999	24,129	16%
\$More than \$29,999	15, 479	10%

(US Department of Commerce, Bureau of the Census, Decennial Census, 1990)

Where are women working in New York City? I wrote and email to a Haitian discussion group, Corbett list, and asked for some contacts of Haitian women in New York City. One of the responses I received was a woman who noticed that almost all of the locker room workers in her local YMCA were Haitian women. This response was not surprising in that of the Haitians included in the 1990 census, 35% of them claimed to be in a service occupation (see table 2). Interestingly enough, the census data shows no specified section of ‘childcare provider’, which--according to Colen and many other Caribbean immigration authors—is a common position for both legal and illegal Caribbean immigrants. Accordingly, these positions are almost always filled with women, which directly corresponds with the gender-labor roles in Haiti. Additionally, of the 33,784 ‘Operators,

⁵⁴ I am using the term ‘stratified reproduction’ in accordance to Colen’s argument: “By stratified reproduction I mean that physical and social reproductive tasks are accomplished differentially according to inequalities that are based on

fabricators, and laborers’, it is easily assumed that a vast majority of the workers are women. Particularly in New York City, where there are a lot of industry and service-oriented positions available to low-wage workers, it is expected that many Haitian women end up filling these roles.

Table 2. Occupations of Haitian Americans, 1990

	Number	Percent
Service	61,321	35
Technical, sales and administrative	36,582	21
Operators, fabricators, laborers	33,784	19
Managerial and professional specialty	22,221	13
Precision, production, craft, repair	11,311	7
Farming, forestry, fishing	6,714	4
Other	1,362	<1
Total	173,295	100

(US Department of Commerce, Bureau of the Census, Decennial Census, 1990)

In Haiti, the average literacy levels of women aged 25-34 are half of those for men of the same age category. Additionally, the incidence of illiteracy is three times greater in rural areas for men and two times greater for women (numbers from Haitian National Survey, EMMUS, 1994/1995). These statistics indicate that many of the Haitian women coming to the US may have low levels of reading comprehension and are, therefore, much less likely than immigrant men to be in managerial and technical occupations. Not only do Haitian women have to deal with the difficult prospects and discrimination/exploitation associated with low-wage immigrant labor, but they also have to deal with the realities of women’s wages in the US. According to the US Council of Economic Advisor’s National report concerning gender-based salary gaps in the US, women earn nationally 75% of what men earn. This statistic alone, coupled with the common single-woman headed household, is indicative of the economic hardships of women living with the exorbitant cost-of-living of New York. In addition to this, in 1996, African-American women earned 63 cents for each dollar earned by white men, which is indicative of racial/salary discrimination lines in the US (‘Working Women’, no author noted).

hierarchies of class, race, ethnicity, gender, place in a global economy, and migration status and that are structured by social, economic, and political forces (Colen 78).”

Although gender discrimination in hiring, pay, promotion and termination has been illegal in the US since the implementation of Civil Rights laws nearly 30 years ago, there are many cases of “steering” women toward traditionally female occupations. So, it is evident that both the complex systems of American labor stratification and gender hierarchy and the social structures of Haiti that contribute to gender discrimination, place the Haitian immigrant women at a severe disadvantage in the New York job market. Needless to say, the wage differentiation coupled with the statistics of the 1990 census and the Haitian wage distribution (Table 2), indicate that the Haitian woman in New York is generally placed in a very low income and social power bracket.

‘Fitting In’: Assimilation and differentiation

Throughout this paper I have discussed many of the dynamic properties of the Haitian woman in New York City. Through Sara’s stories, I have been able to not only relate personal experiences to gathered data and statistics, but have also been able to have a ‘bouncing-off point’ for relaying the diversity of roles and circumstances of Haitian women in the US. It is evident that the Haitian woman in New York is not only forced to deal with the complex issues of immigration and transnationality, but is also faced with issues of gender, racial, and economic-based discrimination. For the Haitian woman in New York, there is often a close-knit structure of kinship ties coupled with a strong Haitian community, however, there always remain very strong association and literal connections with their family, friends and nation—Haiti.

As I talked to Sara, it was evident in both what she said and how she spoke of her experiences that she has struggled a lot with her own identity as Haitian, as a student in an American university, and as a black woman in New York City. According to her, she had been in the position of ‘differentiating’ herself from the black American identity by accentuating her ‘Haitianity’ and of ‘assimilation’, or taking part in what she deems ‘black-American’ issues and society. Although she completely identifies herself as a Haitian, and not a Haitian American—in spite of her US naturalization—she still acknowledges that much of New York society automatically places her in a larger ‘black’ category and identity.

In terms of how I fit into New York, you know, I think I’m something of a young ‘buppie-- It’s sort of like a black yuppie. The neighborhood where I live, it’s got its’

underclass world; it has its' projects, like most black neighborhoods. Most black neighborhoods have a wider variety of incomes because of segregation or discrimination in housing. You'll find a wide, wide range of incomes. When I go to school I'm one of a handful of blacks, and that comes as a hardship for me. I've had to develop my approach to all-white environments over the years. The minute I've walked into a room, I have come to realize that there are things people can't do or say around me, and that's something I've just had to develop. I think that whatever the hardships are for me, they're not the worst type of hardships that blacks have to go through in this country, because I'm black middle class.

My world is my activities. I find as I'm maturing, I leave my bubble less and less. What I'm finding out also is that when I first moved to New York, I wanted to completely enter the world of the black American. But what I'm finding as I'm getting older I'm getting pickier about that. Those differences that I'm talking about, at least the fact that there are certain things I don't like about black-American culture are things that I found out in the past couple of years.

I think what would have helped for me is if I had an accent. If I had an accent, then automatically, black-Americans would know that I'm not American and right away whites would know that I'm not black-American. I don't have a Haitian accent. The thing about me is, when I'm asked who I am, I say I'm Haitian. But really, it doesn't even make a difference because there are so few blacks at the law school in the first place. It's not that I would want it to be a difference. It's not like I'm trying to find a difference between me and a black-American--there a lot of Haitians who do--They come here and see that there is a lot of bad press about black Americans. Precisely because I'm expected to subsume myself to the group, I'm having to ask myself a lot of questions. Oh, 'I thought I was just a black-American', but in fact there are a lot of things that really annoy me and I can't explain it in any other way but that I had a Haitian education and I grew up in Haiti. There are different sets of problems growing up in Haiti. They call for a more color-blind view of the world than black America does. There are a lot of things that I feel black Americans explain with race that they shouldn't explain with race. Everything is about race. I come across this incapability of looking beyond race. Most of the Haitians I know have a more complex analysis of politics. As I'm working in my neighborhood and organizing, I'm finding that most of the women I talk to are Haitian.

In my opinion, understanding the movement or mobility of women within and across national and 'abstract' boundaries is crucial to understanding how women are fighting for equality in the face of complex structures of discrimination. To me, mobility leads to freedom, freedom leads to voice, and voice leads to dialogue. I hope that through this dialogue, we continue to narrow the many narrow-minded gaps that we have created in our society.

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Appendix V: Group and People Contacts

Some organizations working in Haiti include:

Some of the many NGOs providing relief in Haiti include :

- a. American Friends Service Comimittee
- b. B. American Red Cross
- c. CARE
- d. Childreach
- e. Catholic Relief Services
- f. Christian Relief Committee
- g. Church World Service
- h. Direct Relief International
- i. Doctors of the World
- j. Doctors without Borders
- k. Foundation for International Community Assistance
- l. Interchurch Medical Assistance
- m. International AID
- n. International Medical Service for Health
- o. Lutheran World Relief
- p. Oxfam America
- q. PACT
- r. Pan American Development Foundation
- s. Partners in Health
- t. Save the Children
- u. Trickle up Program
- v. World Concern
- w. World Neighbors
- x. World Vision

Some Grassroots Organizations in Haiti include:

1. HOPE (Borgne)
2. Haitian Medical
3. APF (Association Peasants de Fondwa)
4. Fonkoze (micro lending bank)
5. CDRH (Centre de developpement et resources humaines)
6. Rotary of Porte au Prince (water issues and others...)
7. David LaFramboise, Asset Project, Winrock International. laFramboise@netscape.net
8. Marc A. Roger, International Programs Manager, Florida International Volunteer Corps
favaca@hotmail.com
9. Dr. Roberto Caballero Grande, Instituto de Investigaciones Horticolas “Liliana Dimitrova”
liliana@colombus.cu
10. Inite peyzan pou devlopman Gaya I.P.D.G, Cayes-Jacmel
11. Jean-Sébastien Roy, Executive Director, Centre de developpement et resources humaines
C.D.R.H. cdrh_haiti@hotmail.com

Appendix VI: Water Filtration Information

Obtaining Water –

Water from a polluted source may be contaminated with organic material. Cloudy water also requires more time and more chemicals to disinfect, especially if it is cold. Chlorine, (Clorox) in particular is neutralized by organic material.

Methods of removing organic material -

Turbid water - let stand undisturbed for several hours. Pour off the upper clear portion and treat.

Organic impurities may not settle out with gravity alone. Add a pinch of alum (available over the counter in drug stores) and mix. Clumping of suspended organic impurities will occur, and the clumped particles will settle to the bottom of the container. Pour off the upper clear portion and treat. Pour the water through a course paper filter, commercial filter paper, fine cloth, or a canvas filter bag to remove the sediment more rapidly. Pour off the upper clear portion and treat.

Ceramic and glass fiber filters that filter bacteria and parasites also filter out organic material, but clogging will occur. You can either follow any of the above suggestions first, or add a sediment filter on the inlet hose. Ceramic filters can be cleaned many more times than glass fiber filters. Profilers on the intake hose should be used to eliminate large particles.

Methods of Disinfecting Water -

Boiling - Water that is brought just to a boil and then allowed to cool is safe to consume. Boiling water for 10 to 20 minutes, even at high altitudes, is unnecessary and wastes time and fuel. Some people even question the need to boil water at all-they just "pasteurize" it by heating it for a period of time at a sub boiling temperature. To kill cholera germs, for example, boiling is not necessary. Heating contaminated water to 144°F (62°C) for 10 minutes is sufficient to eliminate completely all strains of this bacterium.

NOTE: Boiling water at 10,000 feet raises its temperature to an adequate 194°F (90°C).

An advantage of boiling-Boiling water completely eliminates bacteria, cysts of parasites (amoebic, Giardia, cryptosporidium), worm larvae that cause schistosomiasis, and viruses (the cause of hepatitis, polio, and viral gastroenteritis). Briefly boiling water won't eliminate the spores of certain bacteria; hence, the water can't be considered absolutely sterile. However, bacterial spores, should they be in the water, don't cause intestinal illness and can be consumed without harm. Boiling is easier said than done. Heating the water is time-consuming, often inconvenient, and may require you to carry a source of fuel with you. Boiling is usually most easily done at a base camp, not on the trail.

Iodine or chlorine - Under proper conditions, both iodine and chlorine are excellent water disinfectants for eliminating bacteria and viruses; they are less effective against parasites, especially when contact time is brief and/or the water is cloudy and cold. Take the time to remove organic material. Iodine has been used to disinfect water since the turn of the century and is still the lightest, cheapest, simplest method of water purification. U.S. Army studies have demonstrated that under field conditions (dirty, cold water; a 10-minute contact time) iodine completely kills bacteria, parasites, viruses, and worm larvae. However, that was before Cryptosporidium came along. The one serious drawback to iodine is that it does not kill crypto. Unlike all other microorganisms (bacteria, viruses, Giardia) which iodine effectively eliminates, cryptosporidium is a super cyst with an extremely durable shell. The only way to eliminate it is by either boiling or filtering the water.

Liquid chlorine bleach (4% to 6% Clorox) - Household bleach is easily available and cheap, but doesn't kill crypto and may not kill Giardia or Cyclospora cysts, especially if the water is cloudy or cold. Add 2 - 3 drops of chlorine bleach to each quart of water if it is clear and from the tap; add 4 - 6 drops if the water is cloudy or not from the tap. Wait at least 30 minutes before drinking.

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