THESIS

KILTI PYEBWA, THE CULTURE OF TREES:

THE VALUE OF LOCAL KNOWLEDGE IN COUPLED SOCIAL-ECOLOGICAL SYSTEMS OF RURAL HAITI

Submitted by

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ABSTRACT

KILTI PYEBWA (THE CULTURE OF TREES)

THE VALUE OF LOCAL KNOWLEDGE IN COUPLED SOCIAL-ECOLOGICAL SYSTEMS OF RURAL HAITI

Haiti's area of forest cover has dropped from 80% to less than 2% since the arrival of foreign influence in 1492. Yet, Haitians remain closely intertwined with the environment, depending on trees for food, shade, building materials, medicine, and protection against hurricanes. Organizations have attempted to reforest Haiti, but 50 years of planting has provided only temporary tree cover. From lack of sustainable outcomes, conservation professionals now acknowledge the need for cultural knowledge and Haitian input. My research addresses these lacking cultural aspects and focuses on the *Pwoblem Pyebwa* (Tree Problem) in rural Haiti. I have conducted qualitative, iterative research with Haitian research partners and combined this with knowledge from outsiders. Viewing Haiti as a Coupled Social-Ecological System (as local peoples seem to do) has also allowed me to tease out complex processes that foster a cycle of poverty and environmental degradation, which I have named the *Pwoblem Pyebwa* Cycle. I have also used knowledge from locals and outsiders to situate this cycle in the historical context through the original *Pwoblem Pyebwa* Model. Doing so has revealed systemic causes of deforestation in Haiti in the form of Initiating Factors (factors that initiated and continue to impact the Cycle) and Catalyzing Factors (factors that perpetuate and increase the magnitude of this Cycle). Lastly, I studied different types of trees in rural Haiti and the local uses of such trees. I conducted this research with the mindset that local peoples hold the most knowledge about their uses of trees and should be treated as teachers and me a student of Haiti. In order to better understand what information is locally specific and what information pertains to the larger Social-Ecological Systems of Haiti, I conducted interviews, participant observation, and focus groups in three rural regions: Deschapelles, Ti Bwa, and Anse Rouge.

Each region and each village in these regions had its own set of environmental and social characteristics. Despite these differences, certain commonalities remained constant, and I have set up the *Pwoblem Pyebwa* Model as a tool to understand the culture of trees across regions of Haiti.

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TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

***Pwoblem Pyebwa*: The Tree Problem**

Forest cover in Haiti has dropped from 80% to 2% since Columbus arrived in 1492 (Williams 2011; Roc 2008). Influences on this deforestation include the rise of international timber trade, colonial sugar plantations, and widespread forest use for fuel (Farmer 2003; Diamond 2005; Smith 2001). These forces have catalyzed Haiti's cycle of environmental degradation and poverty, which lowers the quality of life for those practicing traditional Haitian culture. Through multiple fieldwork trips to Haiti and an extensive, mixed methods approach, I developed a model of the cycle I saw operate, a cycle I am calling *Pwoblem Pyebwa* Cycle. *Pwoblem Pyebwa* means "The Tree Problem" in Haitian Creole. This model is shown in Figure 1.1.

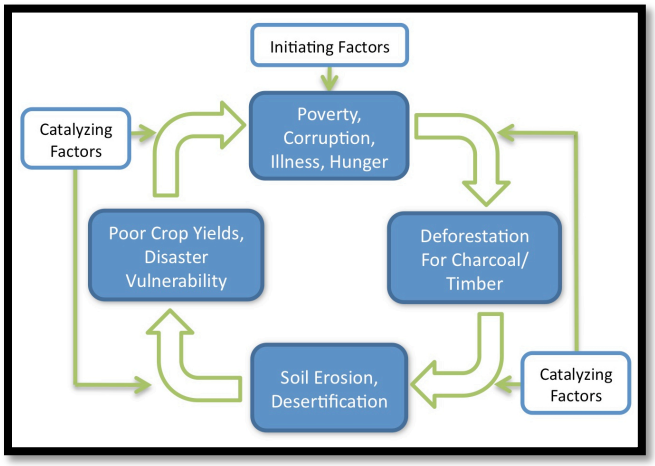

Figure 1.1. *Pwoblem Pyebwa* Cycle

The *Pwoblem Pyebwa* Cycle shows how deforestation has increased vulnerability in Haiti through loss of topsoil, decreased crop yields, and subsequent reduction of food security. Despite more than 50 years of reforestation attempts by outsiders, the Cycle continues.

Understanding the relationship between the local way of life, social-ecological interaction, and the deforestation that plagues Haiti can foster more effective, culturally appropriate solutions to this dilemma. Before acting, outsiders must first look to why foreign development initiatives have routinely

failed to break the *Pwoblem Pyebwa* Cycle. My research argues that answer lies in culture, history, and local knowledge.

Culture, History, and Local Knowledge: The Missing Links

Failed reforestation initiatives support the need for increased outsider understanding of the social-ecological processes that have occurred and continue to occur in Haiti. Despite the fact that millions of trees have been planted during the last fifty years, improvement in tree cover has remained elusive (Murray and Bannister 2004; Buss and Gardner 2008). Understanding the relationship between Haitian culture, history, local knowledge, and tree cover loss can help reveal potential solutions to this dilemma (White and Runge 1994; Raik and Decker 2007; Blauert and Zadek 1998). Michel-Rolph Trouillot, renowned anthropologist and Haitian historian, explains this need to understand peasant culture:

> *Any solution to the Haitian crisis must find its roots in the resources of the peasantry… [others] must talk less about (or 'for') the peasantry and begin listening to what its diverse subgroups have said in the past and have to say now about their future* (1990:230).

The quest to understand this peasant culture begins with January 1, 1803, when Haiti became the only country to arise from a slave revolt and the second independent nation in the Western Hemisphere (Farmer 2003). In light of their military success over hegemonic France, scholars state, "individual land ownership has been highly prized by Haitian peasants throughout Haiti's history" (Zuvekas 1979). Early interventions to combat deforestation did not give attention to such cultural historical facts. Rather, they focused on preventing Haitians from timbering while disregarding Haitian reliance on wood and charcoal (a reliance that accounts for 85 percent of fuel use in the country) (Dolisca et al. 2007; Murray and Bannister 2004). In more recent examples, initiatives fell short because "farmers' personal interests and the opinions of the communities were not considered during project planning" (Bannister and Josiah 1993:241). Because of this, those working in Haiti have begun to question the status quo of reforestation attempts. Previous efforts have provided only minimal and temporary benefits due in part

to a mindset of conservation, premature cutting of trees, and a lack of project continuation. In response, anthropologist Gerald Murray and agroforester Michael Bannister note, "decades of planting failures led frustrated expatriates to be open to new paradigms" (2004:384).

***Kilti Pyebwa*: The Culture of Trees**

With non-governmental organizations now realizing that planting trees is not enough, my thesis presents a new paradigm of valuing local wisdom in reforestation and introducing a cultural historical dimension to reforestation initiatives that is currently lacking. This thesis centers around the research questions "How do Haitians perceive trees, and how does this link to Haitian tree use?" Also, since environmental views may vary between villages (Berkes and Folke 2000), I compare how different Haitian communities understand and use trees. The findings of my thesis may impact reforestation by helping organizations to include Haitian knowledge into project planning, and thus, improve project efficacy.

More specifically, my thesis seeks to promote local knowledge, advance collaborative conservation in reforestation initiatives, and develop understanding of Haitians' relationships with trees. I attempt these goals by focusing on three areas of rural Haiti: Deschapelles, Ti Bwa, and Anse Rouge, Haiti, and learning about the following core research topics from local resource users:

- 1. Household information, information on livelihood activities (farming, charcoal production, etc…), and the tree species used for such livelihood activities,
- 2. Ecological and social changes (including tree cover and livelihood changes) seen during their lifetimes,
- 3. The processes linking these ecological and social changes,
- 4. Peasant perspectives on tree use (including the relationship between humans and trees, sacred species, and rituals), and
- 5. Ideas these rural dwellers may have to improve ecological and social conditions.

Choosing these five core topics came from the suggestion of Handwerker (2011), who recommends having a clear research question and five focus variables in order to get the most quality out of short-term ethnography. As recommended by Bernard (2006), I first conducted informal studies in Haiti to help me focus my research. My four trips to rural Haiti since 2007 gave me a rich background of insights to build upon.

I first travelled to Haiti for one week in 2007 as a freshman undergraduate. During this time, I worked with a Catholic parish from Memphis, TN that was visiting the Central Plateau as part of a long-term partnership. In 2010, I returned alone to the Central Plateau for four weeks. I did so to assess the cultural implications of solar cooking devices as part of my undergraduate program. I later presented my findings at the National Conference for Undergraduate Research. However, before the end of my stay in Haiti, the 2010 Earthquake struck Port-au-Prince. I spent the last eight days of my trip in the capital, working at the Matthew 25 Tent City with non-governmental organization (NGO) workers, doctors, surgeons, and a diligent group of local helpers. Through personal experiences in Haiti, anthropological literature, and lessons learned from previous reforestation attempts, I have decided to address these research questions and core research topics through qualitative methodology and the Coupled Social-Ecological System paradigm.

Haiti: A Coupled Social-Ecological System

> *"To better understand the multifaceted complexity in many human-environmental systems, particularly feedback and dynamics, the last decades have witnessed the advent and increasing popularity of a new paradigm: the coupled natural and human systems approach"* (An and Lopez-Carr 2012:1).

Western society has long compartmentalized nature and humanity as separate entities. Knowledge, land use practices, food systems, and daily activities seem to perpetuate this social-ecological disconnect. Social scientists argue that Western production and transfer of knowledge are tied into different "silos" of knowledge, with little collaboration between different fields. Ingold (2000) describes this process as follows:

> *These fractures ultimately seem to derive from a single, underlying fault upon which the entire edifice of Western thought and science has been built - namely that which separates the 'two worlds' of humanity and nature* (1).

Although there is a growing move to work in interdisciplinary ways, the structure of academic disciplines creates and promotes knowledge in the social sciences as separate from those in natural sciences. Spense (1999) similarly discusses how Western nations tend to separate nature out of society into parks in ways traditional societies do not. These parks are reserved as space supposedly untouched by humans, where people can encounter nature separate from their daily lives. Similarly, Western food systems tend to instill cognitive distance between humans and the food that they eat, stripping it from its natural context and creating more boundaries. Eriksen (2008) describes this process as intensification, specialization, distancing, concentration, homogenization, and the masking of feedbacks. Yet, this perception of separation is not universal across cultures.

Despite its close proximity to the United States, Haitian society seems to live as though there is no separation between humans and nature, even if some locals have internalized Western educations and values.. Throughout my interviews, one of the most common phrases I encountered when talking with Haitians about trees was "*pyebwa yo se lavi!"* meaning "trees are life!" Such a phrase was usually accompanied by energetic hand gestures (a common aspect of Haitian conversation, which coats words in emotion). While this may simply be a local idiom tossed about whenever the topic arises, the inseparability between trees and life, between ecological and social, radiates throughout Haitian life.

Thus, when non-Haitian scholars ask research questions, make observations, and draw conclusions, they may tend to do so through the lens of Western compartmentalization of humans and nature. Doing so ignores the complex web of social and ecological factors that interact and impact Haitian vulnerability. Because of this, literature about Haiti over the past decade has increasingly promoted the necessity of understanding local views and nuanced aspects of local culture in order to more fully comprehend processes in Haiti. This includes work with environmental issues (Murray and

Bannister 2004; Sprenkle 2008), health issues (Farmer 1992), and family planning (Maternowska 2006). Anthropological literature on a broader scale has also come to acknowledge local knowledge as valuable and complementary to Western science because of its ability to provide social-ecological data not otherwise accessible (Berkes 2008; An and Lopez-Carr 2012; Thornton et al. 2011; Marin 2010; Sillitoe 1998; Ingold 2000). With insight into the interrelationship of social and ecological processes, local knowledge seems imperative to understanding Haitian deforestation. I thus attempt to illuminate these interconnecting processes through the visualization of Haiti as a Coupled Social-Ecological System and the use of qualitative, ethnographic research that promotes local knowledge.

Promoting Local Knowledge

One of the main purposes of this thesis is to give credence to local knowledge in reforestation projects. This purpose comes from the encouragement of literature to incorporate the views of locals in Haitian reforestation projects and the recent emphasis in Anthropology to use indigenous ways of knowing alongside Western science (Murray and Bannister 2004; Berkes 2008). Anthropologists and ecologists have come to acknowledge local knowledge as valuable and complementary to Western science by providing social-ecological data not otherwise accessible (Berkes 2008; An and Lopez-Carr 2012; Thornton et al. 2011; Marin 2010; Sillitoe 1998; Ingold 2000). This goes against the "dominant positivist orientation of Western science" in which "conservation professionals assume they know best" (Berkes 2008:238). The positivist orientation has led to unsuccessful reforestation attempts in Haiti (Murray and Bannister 2004). I thus chose to research the local perspective in my thesis through a variety of qualitative methods. Ultimately these methods helped me create the fundamental insights that contribute to the beginnings of a new paradigm in reforestation efforts in Haiti.

CHAPTER 2: RESEARCH DESIGN AND METHODOLOGY

Why Qualitative Methodology?

As discussed by Marshal (1996), methodology should not arise from the preferences of the researcher or what Western culture deems valuable but from the focus of a project. My research attempts to create the seeds of a new paradigm related to social and environmental systems in Haiti: introducing a cultural-historical dimension to reforestation initiatives and examining this dimension through analysis of social-ecological processes and feedback loops. To best develop this new paradigm, I diverge from researchers' common use of quantitative methods in Haitian forestry research (See Swartley and Toussaint 2006). While quantitative methods have their uses (e.g., testing hypotheses, gathering large datasets in quick timeframes), such methods assume that researchers know ahead of time both the key problems and all of the categories of answers that could possibly occur (Rubin and Rubin 2012). Preliminary research reveals that there are problems in rural Haiti (deforestation, hunger, soil erosion, etc), but the range of the problems noted are by no means exhaustive or representative of all communities. Furthermore, the problems highlighted in literature have been filtered through inevitable bias and unintentional distortion of local meanings by Western scientists (Berkes 2008).

A historically heavy focus on quantitative research and outsider knowledge also leads to the mindset that Western knowledge is superior to Local knowledge, ignoring a body of knowledge that has originated from generations of observations and informal experimentation (Marin 2010). As Thomas (1998) describes, the complex issues faced in this century need "a discipline which entertains pluralistic approaches, considers the range of human diversity, and accepts as valid non-Western systems of knowledge" (44).

Failed initiatives to address the loss of tree cover also support the need for understanding Haitian culture (Murray and Bannister 2004; Bannister and Josiah 1993; Buss and Gardner 2008). While some authors (including Murray and Bannister (2004)) have encouraged the incorporation of local

financial needs into project planting, other, more culturally specific tree uses are not discussed as key components of project planning. These studies have been influential in opening outsider initiatives to incorporate certain aspects of local knowledge, and some projects have integrated those aspects that fit into outside business models and donor requirements. Yet, certain facets of local knowledge, including spirituality and tree use outside of the market economy, remain absent from project planning.

The absence of reforestation initiatives and related research in Haiti that focuses on comprehensive understating of local perception and use of trees promotes the use of in-depth interviewing and participant observation with my research partners: rural Haitians. Instead of relying on preconceived categories, I have sought locally perceived problems, tree uses, and potential solutions and compared them across and between communities. To do so, my use of qualitative methods helps foster the discovery of emergent categories and novel understandings (Marshall and Rossman 2011). Moreover, the main goal of qualitative methodology is to "understand the process and character of social life and to arrive at meaning and process" (Altheide 1996). Such a focus on processes and meanings addresses the key areas of research for this project, including the meanings people attach to trees and the processes involved in Haiti's social-ecological systems. This focus also gives credence to local knowledge and worldviews, a key component of my thesis.

With an emphasis on identifying the perceptions of locals and incorporating locals in the development of reforestation initiatives, I will follow Rubin and Rubin (2012) in treating participants as research partners instead of research subjects. I use the terms "research participant" and "research partner" interchangeably, signifying both that they are voluntary "participants" and that they are indeed the experts on their country who are considered valuable and knowledgeable "partners."

The Role of Haitian Creole

Throughout this qualitative methodology, I used Haitian Creole to further incorporate local perspectives and promote local knowledge. Even the name "Kilti Pyebwa," the title of my thesis, seeks

to provide credence to routinely suppressed views of local peoples in rural Haiti. Until 1987, the national language had remained French, the language of those who enslaved and colonized Haitians (Degraff 2005). This policy endured despite the fact that the vast majority of Haitians speak Creole. Literature and personal experience show that government officials and business elites continue to use French exclusively, further marginalizing those individuals who speak only Creole (Farmer 2003). Despite (and perhaps because of) the continued use of French by the small upper class, Creole holds cultural significance, and "even Haitians who master French consider Haitian Creole, which they use for most everyday communication, as the symbol of their national identity" (Valdman 2000:36). This backlash against the view of French as superior is seen through the common Haitian proverb p*ale franse pa di lesprit pou sa*, meaning "speaking French doesn't make you smart" (Lang 2004:134).

The importance of Creole increases in rural areas, where few people speak French and almost no one speaks English. Thus, by naming my thesis in the local language, using this language in all interviews, meetings, and focus groups, and committing to learning the language myself, I have attempted to portray to research partners my respect for their culture and my genuine interest in their beliefs, livelihoods, and ideas while working in my research sites.

Site Selection and Sampling Strategies

Site Selection

In picking research sites (seen in Figure 2.1), I sought first to spend enough time in one location (Anse Rouge area, Figure 2.3) to get a sense of the local context and get to know more about how people live and work. I use the term "Anse Rouge area" because my research focused on rural villages surrounding semi-urban Anse

Figure 2.1. Qualitative Research Sites- Summer 2012

Rouge, instead of the city itself. At times, I simply refer to this cluster of villages as “Anse Rouge.” In fact, the people of this area sometimes refer to the region as a whole as “Anse Rouge.”

As Rubin and Rubin (2012) note, the choice of appropriate sites can allow for the potential generalization of results. Thus, I next sought to triangulate my findings and determine the generalizability of results by visiting two other rural regions (Ti Bwa and Deschapelles, Figure 2.4 and 2.5) and the urban capital of Port-au-Prince (Figure 2.2). These chosen sites were useful for research comparing tree use because of differing environments, differing levels of NGO involvement, and because each area had a reforestation project at a different stage of development. In Ti Bwa, Deschapelles, and Port-au-Prince, I obtained a breadth of data in shorter visits. My research thus provides a more detailed account of life in my primary research site and more broad data from other sites. This has facilitated my understanding of what constitutes locally specific results and what can potentially contribute to general national trends.

Figure 2.2. Port-au-Prince, capital city along the coast, from Fort Jacques

Figure 2.3. Anse Rouge Area, arid coastal region, approaching from the south

Figure 2.4. Ti Bwa, high altitude area near capital, from nearby mountains

Figure 2.5. Deschapelles, fertile land in Artibonite Valley, from surrounding hills

Research Areas and Reflexive Research Timeline

After selecting sites, I formulated a research timeline. I did so in a manner that allowed for preliminary data analysis and reflexivity. I found that this timeline (seen in Table 2.1) allowed for iterative methods and grounded theory, in which "the analyst becomes more and more 'grounded' in the data and develops increasingly richer concepts and models of how the phenomenon being studied really works" (Ryan and Bernard 2000:783). To facilitate this iterative process of grounded theory, I strategically picked the amount of time to spend at each research area and the order in which areas were visited, beginning and ending with Anse Rouge. After six months of transcription, coding, and analysis, I returned to Anse Rouge once more to discuss and triangulate findings. This return visit (discussed separately later in this chapter), also served as a time to reconnect with research partners and, most importantly, to fulfill my promise to them that I would return.

Table 2.1. Research Timeline

Dates	Location	Length of Stay (weeks)	Purpose
June 2012	Anse Rouge Area	2	Data Collection
June 2012	Ti Bwa	<1	Data Collection
June 2012	Deschapelles	<1	Data Collection
July 2012	Port-au-Prince	2	Data Collection, Preliminary Analysis
July 2012	Anse Rouge Area	1.5	Refocused Data Collection
	Summer Total:	**7.5**	
August 2012-January 2013	Colorado State University	-	Transcription, Coding, Analysis
January 2013	Anse Rouge Area	1.5	Reconnecting with Partners, Discussing and Triangulating Findings
	Fieldwork Total:	**9**	

Most of my research took place over multiple stays in villages near Anse Rouge. I spent two weeks among three villages (Tiplaz, Lagon, and Bonnal) gathering data, exploring themes, and preparing discussion topics to use in future interviews. I also used the findings from these to determine how to

work expediently in Saint Marc and Ti Bwa, where funding constraints and logistics (lack of housing, transportation, etc) limited my stays to less than a week. For similar reasons, only one village was selected from each site. After this time, I spent two weeks in Port-au-Prince, where I reanalyzed data, refocused discussion topics, and reassessed areas of observation. During this stay, I also interviewed city-dwellers that had moved from the countryside. I likewise met with NGO workers running reforestation initiatives in my different research areas. I then returned for a week and a half in the Anse Rouge study area, where I used my growing body of findings to decide which topics needed more attention and which types of voices were missing from my research.

Comparing Study Sites

Each of these study sites had its unique ecological and social elements, as outlined in Table 2.2. Elevation gives a rough view of the type of land each village relies on, ranging from coastal lowlands (Bonnal) to fertile river valleys (Ti Bwa) to cooler mountain villages (Lagon, Deschapelles). Distance from Port-au-Prince (PAP) becomes useful in future chapters, where I analyze NGO presence in each area, with NGOs tending to stay close to the capital. Tree cover gives a broad picture of the amount of trees available to research partners in each study site. Lastly, availability of water for irrigation gives an idea of the dependence of local peoples on precipitation, with those that have lower access to irrigation being almost entirely dependent on fluctuating amounts of precipitation. As Table 2.2 shows, each site had its own characteristics, which ultimately impacted the findings in each village.

Table 2.2. Comparison of study sites

Region	Study Site	Elevation (Feet)	From PAP (Miles)	Tree Cover	Water Access for Irrigation
Massif du Nord Mountains (Anse Rouge Area)	Lagon	1500	130	High	Moderate
	Tiplaz	600	120	Moderate	Moderate
	Bonnal	200	115	Very low	Very Low
Artibonite Valley	Deschapelles	100	60	Moderate	Moderate
Chainx De Matheux Mts	Ti Bwa	2000	40	Moderate	Moderate
Baie De Port-au-Prince	Port-au-Prince	0	0	Very low	n/a

Variations were expected for those sites in different regions. Yet, the villages of Tiplaz, Lagon, and Bonnal (seen in Figures 2.6-2.8) featured distinctive ecological and social qualities even though they were each less than 10 miles from one another. Residents of Tiplaz typically had *jaden lakou* (family gardens/yard) with moderate tree cover or 5-10 core species. They also had some access to affordable irrigation water (an asset specified by locals as essential for growing trees in the region). Lagon, further into the mountains, was much more forested, with more tree species and higher density of tree cover in the village. They also had some access to irrigation water. Bonnal, near salt-producing villages along the coast, was much flatter and had almost no tree cover. The few trees present in the village were dominated by the drought-tolerant *bayawon* and *neem* species. Residents of this village had little to no access to irrigation, depending on how close their plots were to well pumps. Even those partners close to these pumps usually could not afford the cost of diesel needed to run the generators. Bonnal thus provided a view of life completely dependent on rainfall for tree planting and agriculture.

Figure 2.6. Tiplaz Village

Figure 2.7. Lagon Village

Figure 2.8. Bonnal Village

Access and Sampling

Before my arrival at these various sites, I contacted NGOs in each area that were in various stages of reforestation initiatives. These organizations had established ties to people of the villages I visited[1]. After explaining my research plan and experience in Haiti, each NGO agreed to assist me with site access and initial sampling. In Anse Rouge, the reforestation NGO in that area had been conducting surveys on demographics and tree use and interviewing locals for roughly six months prior. While I did not use the results of their interviews for analysis, the data collected by the partner organization helped contribute to sampling. Rather than merely choosing a convenience sample from the lists of potential participants, I actively sought the most productive sample by using what Marshall (1996) calls a judgment sample (also known as a purposeful sample). I chose participants with a range of views on the core topics of this research.

Choosing potential research partners included seeking out both women and men, people of different ages, levels of education, and occupations, as well as people who had relationships with various NGOs. Research partners ranged from 18 to 90 years of age, allowing me to better understand perceptions of tree use across generations. This sampling also allowed me to see how environmental and social processes have changed over the lifetime of participants. Judgment sampling allowed me to select those with experience in agroforestry projects and other socio-ecological initiatives along with those that had little contact with NGOs. Lastly, I sought out additional voices that were not heard by NGOs and those that disagreed with the initiatives being performed in each area. While it is impossible for every viewpoint to be heard, these procedures encouraged the sampling of locally marginalized individuals. Such sampling would not have been possible without the assistance of guides from the area,

[1] Ties established ranged anywhere from 3 to 15 years. The most meaningful of ties between NGOs and locals seemed to be those that existed longer and began before the earthquake.

who introduced me to people of each category I was looking for. These guides worked with translators I hired in Port-au-Prince, since I could not find anyone who spoke English in remote regions.

After word about my research had spread through the villages and I felt more comfortable in the communities, I reduced my dependency on guides and began simply walking the community to common areas where people tended to congregate. There, I would initiate conversation with those people I had not yet met. During the beginning of my time in Haiti, translators would assist me, but eventually my proficiency in Creole was adequate for working without translators when meeting new research partners. This strategy included going to places that *blans* (outsiders) typically did not travel, namely the bathing pools, cock-fighting rings, public transportation areas, and Voodoo places of worship. By situating myself in these settings and seeking out those people not friends with local guides or connected to NGOs, I believe I was able to collect more honest and open responses during interviews, generating a wider range of views and knowledge. In the end, my research partners included subsistence farmers, merchant women, charcoal producers, charcoal distributors, Voodoo priests, devote Christians, craft workers, carpenters, NGO employees, former NGO employees, agricultural students, former *resteveks* (oft-mistreated child workers), ex- Guantanamo Bay prisoners, and keepers of traditional medicine.

Data Collection Methods

As my primary tool of data collection, I relied on in-depth interviews that allowed me to pose open-ended questions to these carefully selected research partners. Yet, since different techniques add to the depth and quality of research, I chose to use multiple types of qualitative methods in this project (Denzin 1989). Over the course of eight weeks, I performed 30 in-depth interviews, 28 hours of participatory observation, and 30 informal interviews while walking around *jaden lakou* (family gardens/farms). Three-fourths of the interviews and observations occurred outside of the capital city, but the results of this qualitative research have helped me draw thematic connections between Port-au-

Prince and the rural villages supporting it through food production and charcoal collection.

In-Depth Interviews

When preparing for my research, I chose not to adhere to a strict number of interviews. As Morgan (1996) discusses with respect to focus groups, the number of interviews I performed depended on how many were necessary to provide a saturation of data and pertinent themes. Learning from the experiences of other researchers (Lareau 1996), I also memorized a short and simple explanation in Haitian Creole for what I was doing. I used this explanation on the many occasions that people were curious of my purpose in the area.

When setting out for interviews, my primary contact from each village would take me to the household of interested research partners. The interviews then lasted between 25 and 90 minutes, and they were conducted at a site chosen by the interviewee. Along with more formal interviews, I often asked partners if we could walk around their land and ask a few questions, as seen in Figure 2.9. In this manner, I combined interviews with observations (discussed below).

Figure 2.9. Combining interviews with observations to learn from a farmer in Tiplaz

Since many villagers had limited literacy skills, each interview began with a script used to obtain verbal consent. The informed consent process pulled from the methodology described by Adams et al. (2007), in which open-ended questions were asked throughout the consent process and partners were asked to provide a summary of what they had been told back to the interviewer. I attempted to make sure participants were informed about the research and its voluntary nature while I also learned about local comprehension of my research in the process.

I also used a two-way flow of information to promote accurate translation of research questions. When working with each new translator (three in total), a set of possible interview questions was translated from English into Creole by a native Creole speaker then translated back to English by a second person in order to ensure that the questions retained their original meaning. This process was done using the methodology described by Twinn (1997) and a constant rechecking of translation accuracy as discussed by Kapborg and Bertero (2002). With the interviewees' permission (which was always given), the interviews were audio recorded.

Given the potentially personal nature of some of my questions, which address individual perspectives, religious practices, and changes in livelihood, I used Rubin and Rubin's (2012) Responsive Interviewing Model, in which "both interviewer and interviewee are treated as people, with feelings, opinions, and experiences" (10). This model does not use rigid interview questions, since the same questions and order of questions do not work for every individual (Denzin 1989); rather, it seeks to address both predetermined topics and new topics that arise through the interview or emerge from participant observation.

A loose guideline of core research topics to discuss with research partners (i-v from the beginning of this chapter) emerged based on my preliminary research. Yet, this list was not exhaustive. Given that Charmaz' approach to grounded theory promotes not only conducting research based on what fits our preconceived ideas but also on what the research partners define as crucial (Charmaz 2008), I altered my questions frequently to ask about topics partners seemed to find important. This iterative process increased my sensitivity to aspects of tree use in Haiti that I did not consider before being fieldwork. I most importantly learned of the lack of rainfall and how this issue impacts the need for charcoal production, water rights and its connection to tree planting, the consumption of saplings by goats, and the role of the tree-dwelling *loupgarou* (identified by partners as a flying beast that takes various forms and harms children) in rural life.

Participant Observation

While interviewing provided the base for this research, I also used participant observation as a complimentary method. Adler and Adler discuss the importance of observation as follows:

> *Only by observing their subjects' everyday affairs unfolding and by talking with them about specific events as they are occurring can sociologists discover the way "natives" interpret and ascribe meaning to their complex and manifold activities* (1987:12).

Their quote provides both support for this type of qualitative research and insight into the specific methodology. I learned from locals by talking about the meanings behind activities as they occurred, a process that ultimately compliments the data gathered by interviews and helps check the accuracy of answers (Becker and Geer 1957). Participant observation also revealed key aspects of life I needed to discuss further in interviews, since participants did not necessarily discuss some of the activities I witnesses during observations. MacLeod (1995) supports this use of participatory observation in addition to interviewing, noting that while interviews alone must be accepted as they are, "ethnography based on interviews *and* participant observation can compare a person's stated attitudes with his behavior" (301).

While I never stopped observing to some extent during my seven weeks in the field, I set aside 25 hours as designated participant observation time. I chose this number as an estimate for the amount of available time I would have during my study. This number takes into consideration the 3-4 hours I have found it takes me to write notes on one hour of observation. At the encouragement of Rubin and Rubin (2012), I also performed some of these observations before interviewing. Doing so "sensitized (me) to key issues, familiarized (me) with

Figure 2.10. Participant observation in Bonnal

the environment and the language, and allowed future interviewees to get to know (me) a bit before (I) start asking them questions" (26). Furthermore, this process created a bond of shared experiences that allowed me to shift into an active membership role, improving the depth and quality of my work (Rubin and Rubin 2012; Adler and Adler 1987). Following these recommendations, I spent time in each community participating in daily activities, observing, and establishing bonds of shared experiences. At night, I wrote extensive field observation notes, recognizing that the quality of my future analysis depends on the thoroughness of my field notes (Altheide 1996).

Data Management

With the use of audio recordings in some of these observations and all of my interviews comes the increased concern for ensuring confidentiality, and I took steps in this research to protect the identity of research partners. Before each interview began, I asked the research partner for permission to record the interview. All partners agreed, and each interview was audio taped using a digital recorder. The audio files were then stored on a password-protected computer for the duration of the research and will be permanently deleted after three years.

When possible, I conducted interviews in private, with neighbors and other members of the household out of hearing range. I also incorporated a numbering system in which I assigned individuals random numbers alongside the initials of the study region (e.g., AR3 would represent interview 3 in Anse Rouge, and TB21 would represent interview 21 in the Ti Bwa). I used this numbering system to label field notes, audio files, and all subsequent data. Throughout this thesis and any associated presentations/publications, quotes will never be tied to partner names or other uniquely identifiable characteristics. It would be difficult to disguise the general study locations because this information is essential to help plan reforestation efforts specific to local livelihoods and perspectives about trees. However, I will not identify households. The list linking interviewee ID numbers, household locations,

and other identifying information will be kept in a password-protected file and destroyed after 3 years, following all data analysis procedures.

Data Analysis Procedures

According to Altheide, data analysis consists of "extensive reading, sorting, and searching through… materials; comparing within categories, coding, and adding key words and concepts; and then writing mini summaries of categories" (1996:43). Due to time constraints in the field, I performed the majority of this work after returning to the United States. I did, however, make sure to conduct preliminary data analysis while in Haiti. I used my two-weeks in Port-au-Prince to transcribe sections of three interviews and to code more than five hours of observation notes. This work allowed me to see when I may have led questions or cut off participants accidentally. I also wrote mini summaries at the end of each day, capturing new themes, successes, and failures. This preliminary analysis was essential to the reflexive nature of my project, in which emergent trends and lessons learned helped refocus my project, including the questions asked in interviews and the types of observations made.

Aside from the few interviews transcribed in the field, transcription mainly occurred in the United States using f5 transcription software. To code data from my interviews, I used Atlas.ti software and a mixture of line-by-line, incident-to-incident, and in vivo coding (Charmaz 2006). As Drisko (2004) points out, the use of technologies like f5 and Atlas.ti can assist in the data analysis process, but, "The human researcher, the software user, remains the real qualitative data analyst, as it should be" (207). Thus, I performed the actual analysis, with this software allowing for more efficient transcription and coding in the time consuming process of qualitative data analysis.

Due to the time constraints and the suggestion of Charmaz (2006), I attempted to "move quickly through the data"(49) and create many codes. For in vivo coding, I looked for general terms, innovative terms, and insider short hand terms used by participants (Charmaz 2006). These terms helped me identify emergent themes and incorporate them into future interviews. Preliminary interviews with

Haitian natives and development professionals before traveling to Haiti provided some in vivo codes to remain aware of in the field. Interesting in vivo codes that arose from my prior research include "business as usual," "getting rich at other's expense," "real news," "normal work conditions," and "survival mode" in discussion of livelihood activities and oppressive regimes in Haiti. These participant-generated concepts opened my eyes to potential themes in my research that contributed to field research coding.

I have also used interviews and observations to create an original model of human-environmental interactions in rural Haiti. After six months of analysis, I brought this model and core themes from my research back to my partners in Haiti, the rural peoples who have acted as professors in my quest to better understand social-ecological systems in Haiti.

Return Visit

To strengthen my final findings, to provide feedback to NGOs for improving reforestation efforts, and to fulfill my promise that I would return, I travelled back to Haiti for one week in January of 2013. During this time, I stayed in Tiplaz, where I felt my time would be most productive and beneficial to the new reforestation initiative starting in the village. I first travelled from house to house, visiting research partners and delivering a small token of my appreciation: framed photos of them with their families, which I had captured on my previous trip. During these house visits, I informally discussed life over the previous 6 months. I also invited some of the participants (those that had been particularly interactive and informative) to participate in two focus groups, one for men and one for women.

In order to get a wider range of perspectives, I also used my improving Creole to strike up conversations with strangers. During the hottest portion of the day, I would walk to the local water source and spend an hour or two meeting new people. During the evenings, I would walk along the maze of roads connecting the *jaden lakou*, looking for others to meet as they returned home from the fields or the market.

Three men and seven women participated in two focus groups outside of the local NGO headquarters (the NGO starting a reforestation initiative with the villagers). I selected this area because of the available furniture and the central location in the village, making it easy to tell partners where to meet. (Site selection may have also had undesirable consequences, as discussed in future sections of this chapter). During these focus groups we discussed any inaccuracies in my findings and methods to implement what we had learned in collaboration. Locals acted as teachers to help improve my understanding social-ecological processes in the area. I gave those in attendance time to discuss the research, agree or disagree with conclusions, and ask any questions they had about the project and future reforestation efforts. This process came from both wanting to understand local views as clearly as possible and from wanting to treat participants as partners.

During this time, I also presented visual representations of my findings with labels in Haitian Creole. I created the rough draft of my model, "*Pwoblem Pyebwa*: The Tree Problem", before the summer of 2012, from literature and previous experiences in Haiti. I then used this model as a hypothesis to test through my interviews and observations. After adjusting *Pwoblem Pyebwa* according to the responses of research partners during the summer of 2012, I brought back a revised version in January of 2013. During these focus groups, local peoples analyzed portions of the model representation and offered suggestions, which I then incorporated into the final version of the model (seen in the next chapter).

Before leaving, I left contact cards with each research partner. These cards included my contact information, should the individual have any questions after my departure. These cards likewise contained the information for a local contact, should the research partner not have the means to contact me in the United States. For those interested, I offered to send them a consolidated report of my findings from this iterative research process. I now have a list of interested NGOs and local partners, to which I will send a condensed version of my thesis. It is my hope that NGOs will use the findings of

this collaborative research to improve reforestation efforts in Northwest and Central Haiti, incorporating our new understanding of Haitian culture, local utilization of trees, social-ecological processes, and local ideas for improved projects and improved relationships with NGOs.

Personal Biography

I did not conduct all of this research in the absence of outside influences or biases, and my personal experiences and attributes have most likely impacted my findings in positive and negative ways. Since "good ethnographies show the hand of the ethnographer" (Altheide 1996:79), I have decided to reveal aspects of myself that may have helped or hurt my work. I believe my conscious recognition of these factors since the beginning of this project have improved the quality of my research and increased my sensitivity to potential influences on what I see or do not see in the field.

Firstly, I have developed a base of Haitian experiential knowledge since 2007. Influential relatives and my undergraduate degrees in biology and environmental studies originally prompted my interest in Haiti, a country where environmental degradation and quality of life drastically impact one another. Since that time, I have expanded this knowledge by travelling to rural Haiti, participating in medical missionary trips, focusing my undergraduate and graduate studies on Haitian-specific issues, and performing undergraduate field research in the Central Plateau. My previous research has involved interviewing locals, observing daily activities, and engaging in community meetings, with a focus on the connection between charcoal production and chronic hunger and cultural factors influencing the potential use of solar technology in the Central Plateau.

I have also established a basic understanding of the local language, Haitian Creole, through time spent in the country, continued contact with previous research participants, and two semesters of tutoring. Furthermore, I have received training on how to perform culturally sensitive Haitian research from the following experienced individuals: former Peace Corps volunteer/Haitian Peace Corps representative, Melissa Basta, and native Haitian/CSU professor of finance, Dr. Rosemond Desir. Before

conducting field research, I discussed potential research questions with Ms. Basta and Dr. Desir to promote cultural appropriateness and reduce risks to all participants. Thus, from my previous research experience in rural Haiti, basic language skills, and growing relationships with community members, I was well positioned to interact appropriately and meaningfully within the communities visited.

My long-held care for rural Haitians and the environment further supported my ability to successfully complete this research. Formed during my visit to Haiti in 2007 and solidified through my experiences in the country during the 2010 Earthquake, my core goals in life focus on effective collaborative conservation with rural Haitians. This thesis will further my efforts to form sustainable partnerships that reforest Haiti and improve quality of life for rural Haitians, who depend on their environment in daily life. Extended time in Haiti through this research has accelerated my understanding of Haitians' relationship with the environment at a rate that reading literature cannot. Furthermore, since researchers have shown the potential importance of sharing ideologies with participants (McCorkel and Myers 2003), my interest with rural Haitians proved useful for gaining local trust and openness. My interest in learning the local language, something few outsiders take the time to do, prompted much laughter, conversation, and friendship during my time in Haiti.

This research has also benefited me personally. In order to meet my long-term aspirations, I must develop a more thorough understanding of Creole and knowledge of Haitian culture. With a solid foundation for expanding on this knowledge, my research has granted me the opportunity to learn from the best teachers on the subject: Haitian men and women. Furthermore, this research will assist me in fulfilling my M.A. thesis requirements. Earning my Master's degree will also increase my future worth to Haitian people and NGOs performing collaborative conservation initiatives in Haiti.

Potential Influences and Biases

Collaborative projects with Haitians, similar work with Ghanaians through five years of partnership, my growing understanding of the Creole language, my background in biology and

environmental studies, and a foundation of preliminary research have bolstered my effectiveness in promoting collaborative conservation through this project. Yet, much of my higher education as an undergraduate developed from the lens of positivist science and quantitative methodology. I have since focused almost entirely on subjective anthropological study and qualitative methodology. Both sides contribute to my ability to see life in Haiti as a coupled human-natural system (Liu et al. 2007), but throughout my research I made sure to remain constantly aware of how my two types of education influenced me. By staying conscious of these influences, I can more accurately portray the perspectives of locals.

My status as a white, educated, middle-class, Christian, male American has also impacted my research in ways both obvious and unpredictable. As Liebow (2003) found in his experiences as a white researcher in a predominately black setting, it is important to constantly analyze how I perceive others and how others perceive me. As a white person, Haitians may see me as wealthy, foreign, and unrelateable. From previous experience, they may think I want to hear certain things in my research. Just as medical anthropologist Paul Farmer experienced in his early encounters with Haiti, Haitians are quick to point out racial differences, calling any non-Haitian a "*blan*" (Kidder 2003). While I can never fully dissolve this barrier, I believe that my knowledge of Haitian culture, my key local connections, and my ongoing effort to learn Haitian Creole have encouraged locals to open up to me in ways that they reserve for *natif natal-yo* (natives).

Research partners also noticed my gender. Even though gender issues rarely came up in conversation, scholars promote the recognition of unspoken gender relations (Warren 2001). Because of this potential concern, I made sure to set ground rules in group settings that allowed women to speak without interruption. I also actively sought out both male and female participants to make sure I received perspectives from both genders.

I also brought with me the burden of proving to locals that I do not fit the typical mold of a middle-class American, often seen as sources of easy money. I must admit that at times I have felt perceived as a walking ATM-machine when in Haiti. Due to the historical role of Americans in Haiti and the exposure of rural Haitians to charity-giving foreign development agencies, I cannot blame them for this view, but I had to take steps to avoid being perceived as such. Some of my strategies included dressing as similarly to locals as possible, limiting my use of possible status symbols (electronics, jewelry, expensive clothing, etc) as much as possible, and not favoring those Haitians that speak English or French, as elites and development workers have done in the past.

Lastly, my role as a practicing Christian (although I consider myself among the most open-minded and liberal of Christians) may have both helped and hindered my research. The majority of Haitians practice Catholicism or Protestantism, but they often do so with a strong Voodoo influence. In order not to discredit those who practice Voodoo and to prevent limiting responses about the influence of spiritual beliefs on the interaction between Haitians and trees, I made sure to present myself as open to all beliefs. This presentation included befriending Voodoo priests, not "correcting" anyone about their views of the world, and formulating questions to show my openness (such as "A lot of my friends in the Central Plateau perform rituals with trees, and I found them fascinating! Do you perform any of these rituals?").

When appropriate, I have also seen Christianity create strong bonds between researcher and participant. According to my previous experiences in the country during the earthquake of 2010, Haitians are generally an openly spiritual people that feel God's presence in daily life. Because of these factors, I attempted to provide an environment for people of all faiths to openly express their beliefs, present their ideas for an improved future, and contribute to the collaborative learning of this thesis.

Challenges and Revelations

Through my thesis, I have come to a difficult truism about Haiti and anthropological research in general: while things tend to work out in the end, they rarely do so in the way you plan them. I found that research partners cancel without notice, mosquitoes do not find my deet to be particularly repellant, certain trees make people blister for months, spare tires on rental cars sometimes have holes in them, and flat tires occur frequently in rural areas. Rather than hide the challenges of my research, I have decided to present some of them here, along with various revelations that came from experience. I do so in hopes that they will help others in developing methodology and working reflexively in the research setting.

Giving Back

When first considering the amount of valuable time research partners would be giving for my personal gain as a student, I struggled with guilt. Even though the information gathered would hopefully improve local ownership and project effectiveness for reforestation initiatives in their area, the lack of direct benefit to partners troubled me. My time in Haiti has also showed me the dangers of "NGO Contamination," a phenomenon I saw across Haiti, in which the historical levels of NGO presence in an area correlated with local perceptions of broken promises, inequality, and mistrust of outsiders. Thus, as an outsider, I set out to give back to locals without promoting ideas of outsider superiority or dependence.

I felt morally obligated to give something back and social scientists have long advocated reciprocity to communities being studied (Wax 1952; Marshall and Rossman 2011). But because I was hesitant to give material goods or money, I began by asking research partners if I could help

Figure 2.11. *Konbit* in Tiplaz

them with any farming or other livelihood activities as a repayment for their time. Only a few partners agreed, and more than one laughed while exclaiming that a *blan* like me would surely die in the Haitian sun. Most seemed genuinely shocked that an outsider would even offer to work in the fields. I must admit that dying of heat exhaustion did cross my mind while participating in a local *konbit* (a communal work party traditional in rural Haiti, Figure 2.11), but the experiences gained and relationships built remain invaluable.

While participating in activities with partners, I also had the opportunity to ask them about different activities being performed and the meanings behind them. Working with farmers in this manner acted as both a method of participant observation and a form of repayment. Thus, this aspect of my research added to the integrity of my work while simultaneously improving social bonds, building rapport, and giving back to research partners.

Pyebwa vs. PyeFwi

Just as rural Haitians tend not to divide the worlds of the social and environmental as Westerners do, categorization of tree species also differs. I also came to understand that tree categorization varies from region to region and village to village, even if villages interacted frequently. Tree species names, tree uses, and trees linked to spirituality differed depending on which village I visited or even who I asked within the same village. While I expected some variation in tree species names (as noted by Timyan (1996)), I did not prepare for the possibility that people would use different words to refer to "trees" in general.

Throughout my time in Haiti, nearly everyone referred to trees as "*pyebwa*" or its shorter version "*bwa*," which literally means "wood". All three translators likewise used this terminology, in which all trees fell under the same category of "*pyebwa*". Because of this terminology, translators and I would use *pyebwa* exclusively when asking partners about the trees that they considered most important in their daily lives. In response, 10-12 main trees emerged as having primary importance in

the Anse Rouge area. Each of these trees served a primary purpose, whether it was shade, fruit, timber, charcoal, medicine, or spirituality.

After three-fourths of my time in Haiti had already past, I noticed a peculiar trend: certain villages and certain pockets of people within these villages never mentioned trees that bore fruit when asked about *pyebwa*. Instead, they gave lists of hardwoods. I would routinely ask partners at the end of these interviews if they also found mango trees, coconut trees, or orange trees to be valuable. Predictably, all would respond with a passionate "*wi!*" While I found this question to be uncomfortably leading in nature, I could not resist asking about what I saw as such a glaring omission.

With less than a week left in Haiti, I interviewed a middle-aged woman with dimpled cheeks and a warm laugh. To finish our conversation, I asked her the same thing I asked each participant: "Is there anything else that I did not ask you about that I should have?" As she straightened her floral sundress and prepared to depart, she responded in Creole, "Yes! You never asked me about *pyefwi*!" Elisson, my long-time friend and translator at the time, looked from her to me in puzzlement. After clarification, we learned something I wish I had known a month prior: this woman (and apparently many others in the area) considered fruit trees and wood trees as completely separate categories of organisms.

Rather than separating trees into groups based on their biological characteristics (like conifers and deciduous), many people of the area separated them by their function (do they produce wood or produce fruit?). The rough equivalent to my error would be repeatedly asking a group of American farmers what vegetable they liked planting most and wondering why watermelon never made the cut. While disappointed that I had not figured it out sooner, I am glad to have discovered this nuance before returning to the United States for data analysis.

Focus Groups vs. Home Visits

When organizing my return trip to Haiti for January of 2013, I had planned on having at least five focus groups of 6-12 members. This planning came from the recommendation of Morgan (1996) to

continue having focus groups until a saturation of themes occurs and Bernard (2006) that 6-12 people worked best. I set out to invite as many people as possible to focus groups, which would occur in an open area near the local NGO building. I did so by visiting old research partners or seeking out new partners at popular gathering spots like the local water source and while *fe yon ti vire* (going for a little walk). At the water source, people would talk for hours, sharing opinions and stories and quickly opening up to me. Walking along the road, people would almost inevitably invite me into their homes as they saw me pass. There we would laugh, discuss our cultures, and share food. Despite these meaningful interactions in informal settings, the focus groups that followed provided mixed results, with many people not showing up or becoming generally unresponsive.

One impromptu house visit particularly stands out. A man named Celas invited me into his home, along with an undergraduate intern and a translator/friend who walked with me. Despite never meeting us before, Celas introduced us to his family of eight, fed us, talked with us for roughly forty minutes, and taught us how to cook cassava bread with a topping of house cat. Lively discussion included talk of politics, spirituality, tree use, and traditional medicine- nearly everything I planned on discussing in the formal, focus group setting. Upon leaving, we invited him and his eldest son to join us the following day for a focus group. Only Celas showed up, and in the new setting, his answers became rigid and filtered.

After this and similar incidents, I concluded that in this village and possibly throughout much of rural Haiti, better results and more fluid conversations came from unplanned meetings and familiar locations. Also, I understood that potentially charged locations associated with NGOs (even those NGOs generally approved of by the community) are not conducive to

Figure 2.12. Chickens perch on my arm during an impromptu home visit in Tiplaz

open conversation. After two focus groups with limited attendance (a combined 10 out of 30+ who said they would attend), I changed my plans and my mindset. I stopped conducting focus groups. I began valuing those home visits and unplanned conversations as valuable time for research and relationship building. By doing so, some of my most informative feedback has come from these settings.

Translation Issues and Revelations

At various points in the interview process, the amount of Creole I knew (which grew significantly during my time in Haiti and by the time of my return visit) allowed me to notice when translators did not relay the entirety of a response. This incongruence ranged from a word or two not mentioned to less subtle omissions. Every so often, translators would give one-sentence summaries of paragraphs worth of information. Depending on the situation and the amount of information left out, I responded in one of two ways: 1) by coming back to the audio later, or 2) by addressing the discrepancy in the moment and refocusing the translation process.

Often, when I felt as if I was not getting an accurate translation, I would discretely write down the time of the response. This practice became particularly important for interviews flowing smoothly. Rather than disrupting the interview rhythm and potentially making the research partner lose his or her train of thought or begin shortening answers, I decided to come back to the audio later. If the omission did not seem to be about a charged topic, I would ask the same translator for clarification later in the evening, as I went over notes from the day. Times also arose when the translator's opinion of a topic seemed to alter translation. For these moments, I decided to wait and seek a second translation of the audio from other Creole-speaking friends.

While it may not have happened deliberately, I did notice occasions when the level of formal education and the region from which translators came impacted how they relayed information to me from research partners. One man, a college graduate who had spent more than a decade in the United States, had an outstanding comprehension of both English and Creole. Also, his time in the United States

gave him cultural awareness for how to phrase things in a manner that would make the most sense to Americans. However, his experiences also impacted translation in less obvious ways: in slight adjustments of phrasing that still relayed information but left out bits of cultural nuance.

For example, being an educated man accustomed to the separation of religion and education in the United States, he tended to remove religion and spirituality from answers. An example of this type of omission appears below:

> *John: Can you ask her if she knows why the rain is not falling anymore?*
> *Translator:* Èske ou konnen poukisa lapli pa tonbe*? (Do you know why the rain doesn't fall?)*
> *Partner:* Sèlman Bondye konnen. *(Only God knows)*
> *Translator: She doesn't know.*

Other examples include changing thing like "we trust that God will provide food" to "they trust that they will have food." At times, this tendency would also include deleting phrases or sentences. For example, the partner response "This tree, the *Gayak*, we call it 'God's tree'… it makes great wood" was changed to "This is the *Gayak* tree and it makes great wood." In response, I began memorizing common words and phrases with spiritual meanings and took note of them in transcription. I also took at least one interview from each translator and attempted to transcribe it in both English and Creole. While not perfect, doing so allowed me to see just how much alteration occurred between partner and translator.

Lastly, there were times with each translator when I found it necessary to interrupt the flow of an interview to refocus the translation process. This need occurred most commonly when translators began correcting partners and usually because the research partner did not appear to understand the question. In response to this issue, I felt I needed to keep in mind three sensitivities. First, I wanted to ensure that I received the answers that initially popped into the mind of the research respondent, even if the translator saw them as false or off topic. Second, I wanted to preserve the dignity of the partner, making sure that he or she did not feel degraded or less smart because of the repetitive adjustments of their answers by the translator, a fellow Haitian. After all, my intention throughout this research has

been to treat research partners as the teachers and me as the student. And third, I wanted to make sure that my refocusing of the translation process did not make translators feel inferior or as if their opinions were not valuable. In response, I would reply as follows:

> You are doing great work! It must be exhausting to jump back and forth from English to Creole. This is going to sound pretty silly… and anthropology can be that way, for sure… but I just had one thing to ask: In anthropology, we are interested in learning the first thing that people think of when asked a question, even if it is wrong or way off topic. This way, we might find out something like "Hey, whenever people in this village are asked about trees, they start talking about goats. Maybe we should ask some questions about goats, because they seem to think they are important" or something like that. Even if we may not think they are correct, it gives us some good things to know. So how about this- whenever someone says something like that, before you rephrase the question, just turn to me and translate what they say exactly. Then, you can say something like "John, this lady does not seem to understand what you are asking". From there, you and I can decide a different way to ask the question and get at the answer. Through the interview, try to remember anything they say that you do not agree with. After it is all done, you can tell me everything and I will write down your notes. How does that sound?

This process brought new life to our interviews. The translator was still allowed to demonstrate to me his knowledge and understanding of my more complex ideas, the research partners felt as if their knowledge was important to our study, and as a team, the translator and I were able to refashion questions that made sense to people of the region. As a bonus, the information passed on to me before reformulating questions did indeed open up new themes to discuss with research partners, including goats eating saplings, spirits living in different tree species, and the impact of water rights on ability to plant trees.

CHAPTER 3: *PWOBLEM PYEBWA*: THE TREE PROBLEM

Introduction

Haiti's area of forest cover has dropped from 80% to below 1.5% since 1492 (Roc 2008). This loss includes a drop from 80% of Haiti's land covered by trees to 60% during the time of colonialism, a brief period of reforestation after the Haitian Independence of 1804, and a drop back to 60% by the time of U.S. Occupation in 1915, as seen in Table 3.1. Since the mid 1900's, processes seem to have initiated and catalyzed a cycle of positive feedback loops leading to more deforestation. Recent studies estimate Haitian tree cover at 1.5% or less.

Table 3.1. Loss of Haitian tree cover through history

Era	Date	Starting Tree Cover %	Ending Tree Cover %	Tree Cover Loss %	# of Years
Pre-Contact	-1941	80	80	0	200+
Colonial	1492-1803	80	60	20	311
New Republic	1804-1934	60	21	39	130
Post-Occupation	1935-2013	21	1.5	20	78

(Sources: Roc 2008; Brenner and Binford 1988; Williams 2011; Library of Congress 2006; Gibbons 2010; Mintz 1995; Walter and Ugelow 1979; Katz 2008; Food and Agriculture Organization 1988; ICG 2009; Diamond 2005)

Despite this deforestation, research partners in rural Haiti remain intertwined with their environment, depending on trees for food, housing, rituals, medicine, cooking fuel, and hurricane protection. Loss of these heavily relied upon trees has fostered a cycle of poverty and environmental degradation that I have named *Pwoblem Pyebwa* ("The Tree Problem" in Haitian Creole) occurring throughout the Post-Occupation Era. Through iterative qualitative research with rural Haitians, I have identified processes involved and visually mapped this cycle, as seen in Figure 3.1. I argue that the *Pwoblem Pyebwa* Cycle lowers quality of life through complex social-ecological processes that developed throughout Haitian history.

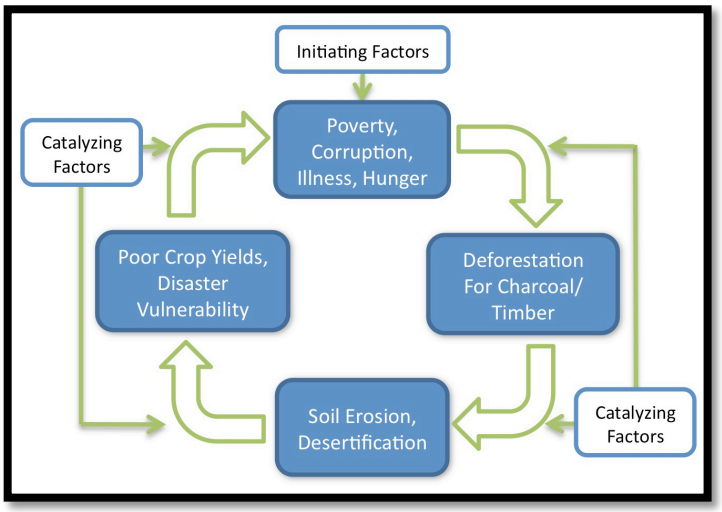

Figure 3.1. *Pwoblem Pyebwa* Cycle currently impacting rural Haiti

Understanding History and Combining Knowledge Types

This study on the *Pwoblem Pyebwa* Cycle follows the suggestion of Mintz (1995), who argues that outsiders should not attempt to address current phenomena in Haiti without first understanding the historical processes involved. Observers have long blamed only Haitians for the issues impacting this Caribbean nation. Yet, international forces have contributed more to vulnerability in Haitian history than foreigners recognize, as pointed out by Kennedy and Tilly (2010). Not acknowledging these connections has resulted in misguided and paternalistic prescriptions to Haitian dilemmas, seen in the mismanagement of Haitian disaster relief after the earthquake of 2010 (Schuller 2012). I argue that 50 years of attempts to address deforestation in Haiti have also suffered from this way of thinking. To combat this mindset, the *Pwoblem Pyebwa* Model provides a means to understand the history of deforestation in Haiti as it relates to current social-ecological processes. Mintz supports such a method to understanding issues in Haiti, and notes, “Haiti's current crisis then, is historical" (1995:73).

Along with history, literature on Haitian deforestation lacks aspects of local knowledge and qualitative understanding of rural culture. My research, which attempts to contribute these lacking aspects, comes after 50 years of outsiders studying Haitian tree loss. Over the last decade, researchers have begun calling for better understanding of local views, but nearly all studies remain focused on

statistical data. Moreover, this data originates from outsider-chosen variables like land tenure, education level, and income (Williams 2010; Dolisca et al. 2009; Dolisca et al. 2007). Such a focus leaves little room for locally observed processes or historical factors.

To better understand the complex interactions between these factors and those aspects overlooked by foreign researchers, I performed qualitative research in Haiti during the summer of 2012 and winter of 2013. I learned from experts on Haitian human-environmental interaction: the rural Haitians that rely on trees. According to Berkes (2008), these people who rely on trees possess more knowledge on the topic than outsiders. Also, rather than focusing on environmental or social factors alone, I targeted the interaction between them, viewing Haiti as a Coupled Social-Ecological System (Lui et al. 2007).

For this portion of my research, I focused on the following research questions: "What do locals perceive as factors impacting deforestation in Haiti?" and "How can this knowledge be used to help improve impacts of reforestation initiatives on resilience and quality of life in rural Haiti?" I then incorporated this data into the *Pwoblem Pyebwa* Model, combining outsider and local knowledge types to understand deforestation as intertwined social-ecological processes. In doing so, I sought to fill gaps in literature on historical and locally acknowledged processes involved in Haitian deforestation.

Haitian Deforestation Literature

As noted in Chapter 2, I have focused a large portion of my research on the social-ecological processes impacting deforestation and quality of life in Haiti. This research focus comes after more than two years of searching through literature. During this search, I have yet to find a comprehensive overview of deforestation in Haiti. Studies on the subject have identified some factors impacting deforestation (such as land tenure and charcoal production), but few researchers, if any, have looked into the complex interactions between such factors. Similarly, few researchers have addressed the

historical causes of this deforestation. Instead, they have tended to focus on Haiti's current citizens and their impact on tree loss while ignoring historical and international impacts.

The limited literature on deforestation in Haiti seems to fall into two categories. The first category includes critiques of current and past initiatives to reforest Haiti, often by those involved in such initiatives (Murray 1986; Murray 1989; Bannister and Josiah 1993; Bannister and Nair 2003; Murray and Bannister 2004; Sprenkle 2006; Sprenkle 2008; Gibbons 2010; Fischer and Levy 2011; Williams 2011). The second category involves research on the causes of deforestation in small regions near Port-au-Prince that the Haitian Government and foreign donors find important (Ashley 1989; Pierre-Louis 1989; Dolisca et al. 2006; Dolisca et al. 2007; Dolisca et al. 2009). Both of these categories provide useful information, and without them my research would not have been possible. Yet, they remain focused on outsider ways of knowing and elite priorities, providing only a partial view of what is occurring.

In the non-academic realm, the tendency has been to focus on isolated poverty and lack of environmental knowledge as the primary causes of environmental degradation in Haiti. It appears that most outsiders (but not all) depict Haiti as a helpless and generally isolated country that can only survive with outside indoctrination. This idea comes across in project websites, which tend to present photos and text depicting the education of local peoples on Western techniques. Schuller (2012) argues that such an emphasis often comes from outside pressures to present Haitians in a way that donors are comfortable with, focusing on the need for outside interaction and the role of poverty in Haiti.

While my research supports the idea that poverty plays a key role in deforestation, I argue here that the causes of such poverty extend further than the island of Hispaniola and include multiple impacting factors brought from centuries of outsider involvement in Haitian affairs. I also argue that honest recognition of such outsider-driven factors should occur before beginning project planning. While doing so may bring in less capital, I believe it can help alter donor perception of rural Haitians while promoting more effective partnerships.

Along with shifting the blame of Haitian poverty and environmental degradation away from rural Haitians, my field research refutes the notion that rural Haitians lack knowledge on the importance of trees or environmental issues. On the contrary, I have repeatedly found Haitians to possess a wealth of knowledge on Haitian tree species, uses of tree species, causes of deforestation, causes of poverty, and the connections between social and ecological processes across space and time. I have also found (to varying degrees) that outsiders working on reforestation projects in Haiti tend to possess limited knowledge on those topics that rural Haitians know so well. Outsiders seem to know little about the history of deforestation in Haiti, cultural uses of trees, and processes leading to deforestation. Instead, many reforestation projects in Haiti tend to focus only on those uses and processes that fit into Western understanding of business and agroforestry.

Understanding Haiti's complex deforestation dilemma requires new categories of knowledge and a mechanism to represent the connections between knowledge from all categories. For new categories of knowledge, my research contributes local knowledge on tree use and human-environmental interactions. To represent connections between humans and the environment impacting deforestation and quality of life in Haiti, I present the original *Pwoblem Pyebwa* Model (seen in Figure 3.2 and discussed below), which situates the *Pwoblem Pyebwa* Cycle in the local and historical context.

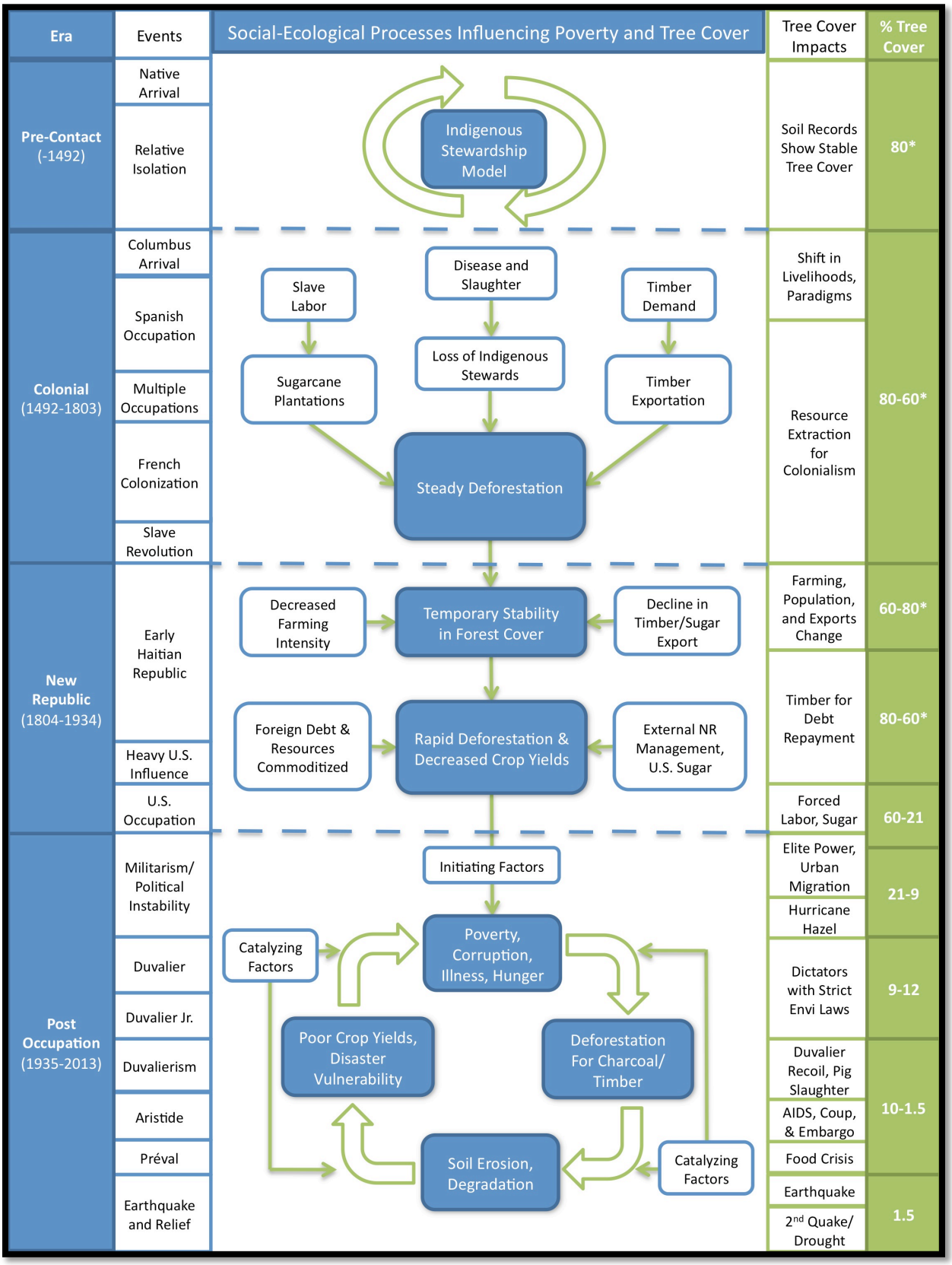

Figure 3.2. *Pwoblem Pyebwa* Model

Pwoblem Pyebwa Model

Realizing the lack of comprehensive knowledge on deforestation in Haiti and the need for such knowledge before attempting to address this dilemma, the *Pwoblem Pyebwa* Model represents social-ecological processes impacting deforestation. The central portion of the model shows the key processes impacting Haitian tree cover through history. I have broken these processes into four eras based on major political events and dominant types of human-environmental interaction: Pre-Contact (- 1491), Colonial (1492-1803), Early Republic (1804-1934), and Post-Occupation (1935-2013). Each era is separated by a dotted line, which represents that processes of each era impact the processes of the following era despite their differences.

Since authors note that Haitian issues must be understood in their historical context (Mintz 1995; Farmer 2003), I have included dates and major events in Haitian history on the left side of the model. These dates and events were not chosen at set intervals of time but rather at intervals that correspond with available data on tree cover and the factors impacting such tree cover. Since one source does not contain a comprehensive view of tree loss in Haiti, tree cover data comes from a combination of literature and the comparison of this data to field research.

The most recent figures on forest cover come from aerial imagery and geographic information systems (GIS). Despite increased accuracy of these methods compared to previous estimation techniques, statistics of tree cover still vary from study to study and even within some studies (for example, Williams (2011) says forest cover is currently 3% on page 20 and then that it is 1% on page 21). Most of the earlier trees cover figures in the model come from estimates found in early studies. Before the U.S. Occupation of Haiti in 1915, tree cover data comes primarily from triangulating pollen levels in literature on Haitian soil samples with historical events and rough estimates recorded from those times (Brenner and Binford 1988; Higuera-Gundy et al. 1999). While pollen samples demonstrate clear trends in forest cover change, they do not provide discrete numbers for tree cover percent. To represent this

uncertainty, I mark these numbers with asterisks in the model. Thus, while data on tree cover in the *Pwoblem Pyebwa* Model may not align exactly with actual tree cover, I believe this model provides the best possible approximation of trends in tree cover given the available literature on the subject and the continued variability in estimates.

For each interval of available forest cover data, I provide temporally specific impacts on tree cover that correspond with these numbers. Thus, while the central boxes of the *Pwoblem Pyebwa* Model provide an overview of social-ecological processes for each era, the green boxes to the right show processes specific to that smaller time frame and the tree cover data for the same time frame. For example, while certain processes continued throughout the Early Republic Era, the U.S. Occupation from 1915 to 1934 contributed certain specific impacts on forest cover. I present some of these impacts in the "Tree Cover Impacts" column. Doing so promotes the recognition of trends in human-environment interaction and forest cover loss, as seen by the loss of tree cover from 60 to 21% during this same time frame (Roc 2008).

Due to space limitations, the *Pwoblem Pyebwa* Model provides only words or small groups of words to represent complex social-ecological processes impacting deforestation in Haiti. The full value of this model comes from the understanding of what these words represent and how these processes combine to initiate and catalyze the cycle of poverty and deforestation currently underway in Haiti. I dedicate the remaining portions of this chapter to explicate those social-ecological processes represented in the *Pwoblem Pyebwa* Model, focusing on novel contributions from my research.

Initiating Factors and Catalyzing Factors

Qualitative research on the *Pwoblem Pyebwa* Cycle of the Post-Occupation Era has provided two categories of results. Firstly, Haitian partners have helped uncover novel themes not given emphasis in literature on deforestation in Haiti. These themes include Initiating Factors (historical causes of the

cycle) and Catalyzing Factors (things that perpetuate the cycle). Secondly, this model provides a visual method with which to educate *blan*s (outsiders) on social-ecological processes interacting in Haiti.

Table 3.2 shows those Initiating Factors already discussed in literature (not bold) and those that have arisen from this research (bold). Bold factors thus illustrate novel themes that can contribute to cultural understanding of those outsiders working with deforestation in Haiti. These novel themes include Post-Colonial Foreign Relations, Foreign Occupation, and Loss of Indigenous Stewardship. **Post-Colonial Foreign Relations** refers to outsider influence on Haiti during the New Republic Era. As discussed later in this chapter, outside governments required Haiti to pay reparations for damages associated with the Revolution of 1804, placed embargos on trade, and funded corrupt leaders. **Foreign Occupation** refers to the U.S. Occupation of Haiti from 1915 to 1935. During this time, outsiders forced Haitians into work parties. They also militarized the nation, forming the Haitian Army and giving power to corrupt leaders. **Loss of Indigenous Stewardship** refers to the death of native Haitians shortly after the arrival of Columbus. I argue that all of these factors contributed to the initiation of the *Pwoblem Pyebwa* Cycle in Haiti.

Table 3.2. Initiating Factors of *Pwoblem Pyebwa* Cycle (Bold= Novel or Modified Contribution)

Initiating Factor	Prominent in Deforestation Literature?	Prominent in Field Research?	Processes
Post-Colonial Foreign Relations	**NO But supported by linking literature and field work**	**YES Discussed heavily**	**–Reparations/Embargos –Funding Corrupt Leaders**
Foreign Occupation	**NO But supported by linking literature and field work**	**YES Discussed moderately**	**–Forced Work Parties –Militarization/Corruption**
Loss of Indigenous Stewardship	**NO But supported by linking soil data and ethnographic work**	**NO**	**–Indigenous Disease/Slaughter**
Shift in Farming Knowledge	YES	NO But occasionally mentioned	–Revolt Cleansing –Plantations, Subsistence, ”Modern”
Sugarcane Plantations	YES	NO But occasionally mentioned	–Sugar to Europe –Destroyed, Parceled, Rebuilt by U.S.
Timber Exportation	YES	YES	–Mahogany to Europe –Debt Repayment

Table 3.3. Catalyzing Factors of *Pwoblem Pyebwa* Cycle (Bold= Novel or Modified Contribution)

Catalyzing Factor	Prominent in Deforestation Lit?	Prominent in Field Research?	Processes
Climate Variability	**NO**	**YES Most emphasized factor**	**– *Lapli Pa Tonbe***
Water Tenure/ Water Access	**NO**	**YES Heavily emphasized/observed**	**– *Gran Dom*/NGO Wells** **– Lack of local irrigation water**
Commoditized Goods and Services	**NO**	**YES Heavily emphasized/observed**	**– Medical, Education, Food** **–"Chemical Foods"**
Dependency	**NO Some, not linked to trees**	**YES Heavily emphasized/observed**	**– US Food Aid** **– "Republic of NGOs"**
Pig Eradication	**NO Some, not linked to trees**	**YES Heavily emphasized/observed**	**– "Peasant Stock Market Crash" (80's)**
Corrupt Politicians	**YES Commonly blamed**	**YES Dictators good for trees** **NO Recoil bad**	**– Post-Duvalier Recoil** **– Embargo & Fuel**
Lack of Education	YES Commonly blamed	NO Extensive knowledge on trees	– Supposed Lack of Tree Knowledge
Land Tenure	YES Most emphasized factor	NO Scarcely emphasized/observed	– Less Investment in Conservation
Natural Disasters	YES Hurricane Hazel	YES Hurricane Jeanne/Earthquake	– Hazel ('54) Jeanne ('04) – Earthquake ('10)
Urbanization	YES Moderate emphasis	YES Moderate emphasis	– Increased Charcoal Demand
Population Growth	YES Moderate emphasis	YES Moderate Emphasis	– Increased Charcoal Demand

Table 3.3 shows Catalyzing Factors. Those factors most heavily discussed in interviews/focus groups or seen in observations were **Climate Variability** (*lapli pa tonbe* "the rain doesn't fall", changes in seasonal rainfall and temperature trends), **Water Tenure/Water Access** (lack of irrigation water leading to the need for income from charcoal in dry times), and **Commoditized Goods and Services** (things once found or made must now be purchased). The *Pwoblem Pyebwa* Cycle seems to also be catalyzed by **Dependency**, which I refer to as the dependence on foreign nations as promoted by U.S. Food Aid and the current status of Haiti as a "Republic of NGOs" with an undermined government (Schuller 2012).

These factors go against the idea in previous studies that Haiti lacks tree cover primarily because of land tenure issues, corruption, and lack of education (Zuvekas 1979; Dolisca et al. 2007; Dolisca et al. 2009).

The wealth of knowledge contributed by research partners also goes against the idea that Haitians lack environmental understanding and need training (Bannister and Josiah 1993; Dolisca et al. 2007). Instead, my qualitative research and studies elsewhere suggest that outsiders working in Haiti should receive education on social-ecological processes that have originated throughout history and continue to impact deforestation in Haiti (Berkes 2008). I argue that the *Pwoblem Pyebwa* Model can be used as a tool to facilitate this education and promote collaborative discussion on how to stop the cycle of deforestation and poverty.

This model also seeks to address the question many outsiders ask when considering the current conditions in Haiti: "Why Haiti?" One reason alone cannot be given to fully answer this question. Instead, numerous factors combine to explain "Why Haiti?" These factors include resource extraction early in the history of Hispaniola, the Haitian Revolution at a time when outsiders did not see slaves as fit to rule, trade embargos against the young nation, the need to pay of foreign debt, and the use of Haiti for outside gain. I discuss these and other factors in the following sections. In order to fully comprehend deforestation in Haiti, outsiders must begin by understanding the earliest European contact with Hispaniola.

1. Pre-Contact Era

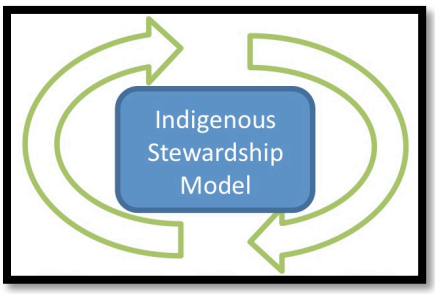

Figure 3.3. Pre-Contact Era excerpt from *Pwoblem Pyebwa* Model

Christopher Columbus first set foot on Hispaniola (later to be separated into Haiti and the Dominican Republic) in 1492. At the time of his arrival, tropical forests covered the majority of the island. Anywhere between 1 million and 8 million Arawak Indians also inhabited Hispaniola, only to die within the first few hundred years of contact (Farmer 2003). Due to their early eradication, little is known about Arawak culture, and my assumptions about this era come instead from pollen levels in soil samples and literature on other indigenous resource users of the New World.

Since the mid 1900's, pollen analysis, or palynology, has been used in archaeology and biology to learn about natural history and past interactions between humans and the environment in an area (Evans and O'Connor 2001). This includes using pollen levels in soil to test historical forest fires (Tinner 1998), analyzing climate change (Ivanov et al. 2002), and learning about past vegetation (Soepboer and Lotter 2009). While there have been critiques of pollen analysis, including that pollen deteriorates over time, studies making these critiques encourage the use of pollen analysis for understanding cultural use of plants when other means are not available (Bryant and Hall 1993). Soil studies in Haiti suggest that native Haitians had minimal impact on forest cover and support the idea that they used a method stewardship less damaging than outsider resource users, seen in later eras (Brenner and Binford 1988).

Many extant indigenous groups exhibit this sustainable use of resources when compared to outsider methods of resource extraction for capital gain. Examples include nomadic groups identifying and adjusting to feedbacks between vegetation and local weather in ways outsiders cannot (Marin

2010), indigenous fish and timber use compared to more destructive outsider methods (Brondizio et al. 2009), and the multi-generational use of animal populations compared to declining populations with outside management (Nadasdy 2003). Ross et al. (2012) also present empirically based discussions of collaborative stewardship from a variety of case studies. They use these case studies to present an Indigenous Stewardship Model (Ross et al. 2011) characteristic of North American native peoples that the Arawak of Hispaniola are thought to have originated from.

While some authors highlight examples of indigenous peoples negatively impacting natural resources, available data supports positive indigenous stewardship by Arawaks of pre-Colonial Haiti. Diamond (2005) presents instances of native forest use on other islands that resulted in environmental destruction and the downfall of indigenous cultures. Yet, analysis of population and forest cover in the Pre-Contact Era suggests that natives to Hispaniola used their environment in methods similar to the Indigenous Stewardship Model of natives inhabiting mainland North America. Arawak practices sustained at least one million people on a relatively small Caribbean island while retaining an estimated 80% forest cover (Roc 2008). Soil data also supports the presumed indigenous stewardship of the Arawak natives. By measuring pollen levels in soil preserved at the bottom of Lake Miragone, Haiti's largest body of freshwater, natural scientists have concluded that early inhabitants had minimal impact on the Haitian environment (Brenner and Binford 1988). Instead, Brenner and Binford have found two major periods of deforestation, the first of which coinciding with the arrival of Europeans in the 15th century and continuing through the Colonial Era (1988).

With the loss of the Arawak people so too was lost their systems of resource use in Haiti. Many of the plant and animal species of Haiti cannot be found anywhere else (Williams 2011). Therefore, native Haitians used these resources in ways that differ from outsiders not familiar with Haitian species. Berkes (2008) explains the negative impact of the loss of this and other indigenous cultures as follows:

> *These communities are the repositories of vast accumulations of traditional knowledge… their disappearance is a loss for the larger society, which could learn a great deal from their traditional skills in sustainably managing very complex ecological systems* (114-115).

Haiti saw the loss of this indigenous culture in the Colonial Era, when timber exportation, sugarcane plantations, and loss of indigenous stewards prompted steady deforestation.

2. Colonial Era

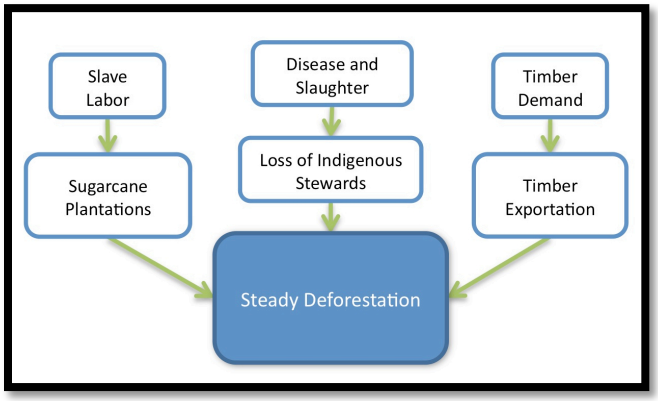

Figure 3.4. Colonial Era excerpt from *Pwoblem Pyebwa* Model

2a. European Conquest

While the first exchanges between Hispaniola natives and European explorers proved amiable, Columbus' presence began a process of cultural, environmental, and physical death. Scholars continue to debate the size of Hispaniola's native population prior to outside contact as well as the specific nature of European influence on the islanders. Most agree that at least one million Arawaks lived on the island, and some estimate numbers as high as eight million (Farmer 2003). Regardless of the original number, most of the native population disappeared in the first 25 years of European influence. In the 17th Century, the native population was completely annihilated (Smith 2001). At best, Columbus and his men inadvertently caused the downfall of natives through disease and occasional physical conflict. At worst, they actively pursued eradication of Hispaniola's inhabitants. The eradication of these people simultaneously acted as an eradication of cultural knowledge about human-environmental interaction.

The arrival of slaves in Haiti (whose descendents make up the majority of the country's current population) coincided with further separation from the rhythms of nature. As European markets determined what to grow and in what quantities, farming became detached from those dependent on the land for survival. Eriksen (2008) notes the danger of outsider control, since food systems "depend upon ecological variables for their most basic function, yet they are largely driven by social processes and policies" (6). Brondizio and others (2009) echo the dangers of this setup:

> *Often, this leads to ownership or control of harvesting operations by distant decision makers who have little or no knowledge of local conditions, strong incentives to think in terms of commoditized products, and little interest in the maintenance of ecosystem services that are important to local users* (267).

2b. Colonialism

Colonialism in Haiti shifted the stewardship of trees and other resources from Haitian inhabitants to distant decision makers removed from the local context. These outsiders acknowledged the natural wealth of Haiti, labeling it the "Pearl of the Antilles." Now known as the poorest country in the Western Hemisphere, Europeans saw Haiti as the most profitable colony in the world throughout much of the Colonial Era (McClellan 2010). Colonizers eventually found many uses for Haiti, but what most impressed them was the abundance of lucrative trees. As Diamond puts it, "The first European visitors noted as Hispaniola's most striking characteristic the exuberance of its forests, full of trees with valuable wood" (2005).

With colonialism came tree loss. Just as literature supports the idea that traditional resource users are often best suited to plan for sustainable use of the resources they depend on, it also warns of the dangers of resource management by those not dependent on the environment (Brondizio et al. 2009). Soil data shows that the first detectable loss of forest cover in Haiti corresponds with increasing European influence (Brenner and Binford 1988). This connection suggests that the colonial view of foreign lands as sources of European wealth resulted in the unsustainable extraction of resources once used sustainably.

While Haiti as a nation did not arise until 1804, this commoditization of nature came long before independence. Outsiders used timber exportation and sugar plantations as primary methods of resource extraction in colonial Haiti. Exporting timber began with European mahogany demand and the outsider perspective of natural resources as a source of gaining wealth (Gibbons 2010). This imported perspective continued as a means to pay back foreign debt and increase elite wealth long after Haitian

independence (Kennedy and Tiller 2010; White and Jickling 1995). Timber exportation thus initiated a process that would continue throughout Haitian history: the use of trees for the benefit of a select few (usually outsiders) at the expense of those dependent on trees in their daily life.

Colonial timber demand was surpassed only by demand for sugar. As seen in Mintz's *Sweetness and Power* (1985), the arrival of this crop tended to foreshadow subjugation of those of lower social status. Increases in European sugar use prompted expanded slave labor. Consumption of sugar in Europe swelled to the point that it was a necessity by 1800 and made up 20% of European calories consumed by 1900 (Mintz 1985). To satiate the changing European palate, French colonizers felled large swaths of trees and formed sugarcane plantations with slave labor as early as 1697 (Gibbons 2010). This practice impacted tree cover through both immediate tree loss and the long-term change of farming methods. These methods went from small-scale subsistence agriculture to large-scale planting and monocrop plantations.

Sugar production also initiated what can be viewed as the extraction of soil nutrients for export to other countries. Exporting timber and sugar removed nutrients from the biogeochemical cycles of Haiti that once replenished soil. This nutrient depletion, catalyzed by increased erosion without tree cover, has contributed to the loss of soil productivity in Haiti. Centuries after European colonizers first mined the land for its resources, only 20% of Haiti's surface area is considered arable even though 50% is currently being cultivated (McClintock 2004), as seen in Figure 3.5.

Figure 3.5. Farmers look over a farming plot considered too steep and not arable by outsider standards

Historical accounts and soil data support the idea that outside influence in the Colonial Era first initiated deforestation and soil loss in Haiti. Europeans perceived the mountainous forestland as

something to be controlled, altered, and used for input into international capitalism. Land (and the trees on that land) became a commodity. What began as the wealthiest colony in the world, the "Pearl of the Antilles," rapidly degraded for the wealth of a select few (Roc 2008). In his assessment of the environmental disparity between the Dominican Republic and Haiti, Diamond notes that "Haiti's burst of agricultural wealth came at the expense of its environmental capital of forests and soils" and that "an impressive-looking bank account may conceal a negative cash flow" (2005). This "negative cash flow" continued to impact tree cover in eras to come. Haiti's loss of environmental capital during the Colonial Era (an estimated decline from 80% to 60% tree cover over more than 300 years) was far surpassed by the repercussions of Haitian independence in the Early Republic Era, seen in Figure 3.6.

3. New Republic Era

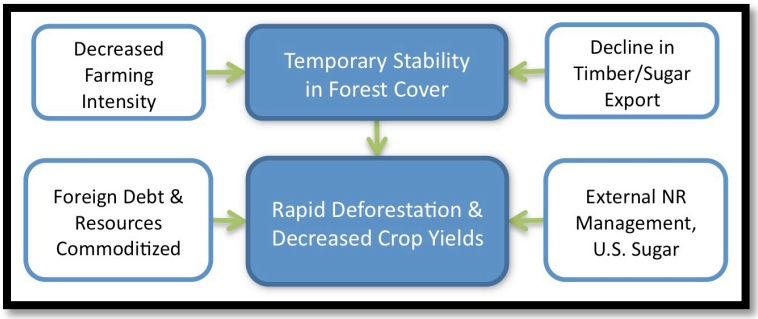

Figure 3.6. New Republic Era excerpt from *Pwoblem Pyebwa* Model

3a. Haitian Independence

On January 1, 1804, The Republic of Haiti became the first and only country to arise from a slave revolt. After the United States' independence only 27 years prior, these slaves formed the second independent nation in the Western Hemisphere. While the New Republic Era saw more deforestation by area than any other, studies disagree on the impact of Haitian self-rule on tree cover loss. Some historical accounts argue that land tenure changes and farming on high altitude hillsides led to increased deforestation immediately after the revolution (Zuvekas 1979; Diamond 2005). However, with the support of studies on pollen levels in soil (Higuera-Gundy et al. 1999; Brenner and Binford 1988) and the insight of rural Haitians, I argue instead that the social-ecological processes impacting deforestation in this era were more complex and ultimately fueled by outsider influence.

When looking at available data since Haitian independence, tree cover seems to have dropped from 60% in 1804 to present day's 1.5%, with a decline to 21% in the Early Republic Era (Library of Congress 2006). At this temporal scale, assumptions have been made by outsiders about the role of Haitian rule, land tenure, and rural ignorance on environmental degradation. Such a mindset has been perpetuated by quantitative studies that focus exclusively on outsider categories like land tenure and lack of education (Bloch et al. 1988; Fischer and Levy 2011; Dolisca et al. 2009; Dolisca et al. 2007) and the popular emphasis on educating locals about outsider knowledge during reforestation projects (Comino 1988; Williams 2011). While land tenure, corruption, and other popularly cited impacts do

seem to impact deforestation in Haiti, I argue that outsiders have influenced these factors. Moreover, I argue that novel categories are needed to understand the complexity of Haitian deforestation. Looking at deforestation data from a smaller temporal scale supports this argument.

Contrary to the idea that Haitian rule and tenure systems primarily caused deforestation, soil analysis has shown that tree cover leveled out and actually increased following Haitian independence (Higuera-Gundy et al. 1999; Brenner and Binford 1988). Brenner and Binford note that historical evidence supports their findings and that "reestablishment of natural forests may have been aided by the demise of the plantation system and a return to subsistence practices on smaller plots" (1988: 95). Thus, the shift to parceling of land that researchers have used as an explanation for deforestation during the Early Republic Era may not have had a negative effect on tree cover. Instead, a shift to smaller plots and subsistence needs for trees may have increased forest cover before outsider influence caused massive deforestation. This outsider influence primarily took the form of trade embargos and imposed debt.

3b. Trade Embargos and Foreign Debt

After gaining independence from France, Haiti was used as an example for why blacks should not rule themselves, and their eradication of slavery was met with European animosity. Farmer provides a summary of this paradox, "Perhaps it is ironic that Haiti, riddled with inequity, is considered by its people to be 'the birthplace of freedom'- a heritage for which Haiti, and Haitians, would be repeatedly punished" (2003:61).

Trade embargos arose as the first of these punishments, with white-led countries not prepared to accept Haitian legitimacy. Still dependent on slavery, the United States refused to acknowledge Haiti as a country until 1862 (Smith 2001). Siding with France, they claimed that blacks were not fit to rule and subsequently restricted all trade. Such embargos left the young nation-state little hope of fostering a lasting economy. As seen a more recent embargo from 1991 to 1994, this type of event can increase

deforestation from lack of imported energy sources and an increased reliance on fuelwood and charcoal (Roc 2008). While Arawak natives seem to have survived without much international trade, the newly freed slaves had been exposed primarily to an economy with heavy emphasis on exporting. Slaves may have passed down environmental knowledge, but this knowledge originated in the savannahs of Eastern Africa and had little use in the Caribbean tropics. Deforestation also increased in the periods following Early Republic embargos. While direct causation is not known, I argue that these embargos (along with foreign debt) stifled Haiti's early economy and ultimately acted as Initiating Factors in the *Pwoblem Pyebwa* Cycle of poverty and deforestation.

While the United States refused to trade with Haiti, France took more drastic measures to hinder the Haitian economy. Despite actions by French slave-owners (who frequently tortured Haitians, skinned them, and forced them to eat their own excrements), France imposed a form of reverse reparations. As discussed by Kennedy and Tilly, "France wrought massive destruction in attempting to recapture its former colony, then extracted 150 million francs of reparations, only fully paid off in 1947" (2010:8). This debt resulted in 80 percent of the Haiti's national revenue going directly to its former slave owners (Farmer 2003). As a result, early Haitians were left with a damaged country, unappeasable debt, and no means of trade to develop their economy.

In order to begin paying off foreign debt and to fuel the economy, tree cutting increased. Haitian elites followed the imported perspective of the environment as a source of capital on the international scale. White and Jickling discuss deforestation for timber, noting, "This process continued after the revolution when the new governments let out extensive logging contracts to international firms in order to gain hard currency" (1995:9). Certain types of wood were selected over others. Gibbons (2010) points out that of the hardwoods, which outsiders first saw as the island's greatest resource, nearly all mahogany was logged for European furniture.

I argue that such logging came not out of rural Haitian ignorance or from isolated land tenure issues. Instead, my research suggests that deforestation at the hands of the Haitian peasantry has been and continues to be intertwined with international processes. While not popularly accepted by those outside organizations attempting to reforest Haiti, researchers have noted some of this connectedness. As Smith discusses in her ethnographic work on political songs of the Haitian peasantry, "in reality, Haiti's rural poor have never constituted an isolated population, nor have they been removed from larger political, economic, social, and cultural spheres" (2001:12).

Far from ignorant about the importance of trees, rural Haitians have taught me about the many uses they have for trees in their daily lives. Among the most common phrases I heard during interviews, people or both genders and all ages routinely exclaimed "*pyebwa yo se lavi!*" (meaning "trees are life!"). And just as early outsiders prized mahogany and other hardwoods, rural Haitians reiterated the importance of hardwoods in their lives and for environmental health. Because of uses for housing, furniture, cooking fuel, medicine, hurricane protection, and spirituality, partners actively preserved and planted mahogany and other hardwoods (like the prized *gayak* tree of the arid northwest, seen in Figure 3.7). Local names given to this group of trees support their importance. Haitians of Anse Rouge routinely referred to them as *Bwa Bondye*, or "God's Trees."

Figure 3.7. *Gayak* tree in Anse Rouge Area, considered one of "God's Trees" by local peoples

Without this ethnographic data, it is difficult to see the importance of this loss of forest cover from an estimated 80% to 60% in the late 1800's and early 1900's. Resource user insight shows that with the selective deforestation of the Early Republic Era, rural Haitians lost their supply of *Bwa Bondye.* Not only did they lose environmental capital in a monetary sense but also those trees they heavily relied

upon in daily life. I argue that this Initiating Factor impacted and continues to impact the cycle of poverty and deforestation currently at work in Haiti. Such selective deforestation still impacts Haiti, but it has been surpassed by the massive deforestation during and immediately following U.S. occupation.

3c. Return to Foreign Occupation

The change in tree cover from 1915 to 1945 demonstrates the extent of Haiti's environmental destruction from outside influence. Through the first four centuries of European contact with Haiti, tree cover dropped 20% (from 80 to 60%)(Williams 2011). During the 20 years of U.S. occupation and 10 years of politically volatile aftermath, tree cover dropped from 60 to 21% (Roc 2008). Thus, American presence in Haiti fostered twice the deforestation of the previous 400 years combined. Few studies address why this unprecedented level of deforestation occurred during and immediately following U.S. presence in Haiti, but historical accounts of this time period provide some insight. These accounts suggest that deforestation accelerated so rapidly because of changes in land use, militarization, and increased inequality.

One possible reason for this deforestation is the forced labor of Haitians for mountain road building. Justified as a means to civilize the "savages" of Haiti, U.S. Military forced rural Haitians to build roads into the highlands through *corvee* work parties. Roads provided vehicle access to untouched forests and increased the rate of timber extraction. Rural Haitians forced to build these roads never saw wealth generated from their work, and this money ultimately went to the United States and a hand-selected group of mulatto elite (Smith 2001; Farmer 2003). This neocolonialist version of slavery can be seen in other societies as well. People living in rural Madagascar have experienced similar *corvee* systems of forced labor to fuel capitalistic endeavors, and these endeavors ultimately degraded the local environment (Seagle 2010). Forced labor in Haiti, as in Madagascar, continued the inter-era trend of environmental degradation for the benefit of outsiders and a small elite.

Studies also support the idea that U.S.-induced land use change for sugar production also accelerated deforestation in Haiti (Mintz 1995; Roc 2008). Haitians had shifted towards smaller subsistence plots (a shift that coincided with increased forest cover in Haiti (Brenner and Binford 1988)), but the United States attempted to shift back to the plantation agriculture of the Colonial Era. To do so, they cleared and burned large areas of land, oversaw the planting of cane, and installed sugar mills. Gibbons (2010) identifies sugar mills (which run on wood fuel like timber and charcoal) as a primary cause of deforestation during what I have identified as the Early Republic Era. Roc (2008) also connects deforestation to the U.S. concentration of landownership among a small elite. Such a process evicted rural Haitians who depended on the land for survival. While the plantation system fell apart soon after U.S. departure, the impact of this outside influence on deforestation continued long after a select few gained from the environmental degradation (Mintz 1995).

Figure 3.8. Sugar cane growing near Ti Bwa

3d. U.S. Formation of the Haitian Army

Above these labor regimes and land use changes, the most influential action of the United States was the creation of the Haitian Army. During the 1915-1935 occupation, the U.S. government installed, trained, and funded a novel Haitian Army. This army was created through an act of U.S. Congress, even though Haiti had little need or want for military. Anthropologist Mark Schuller provides a summary of the long-term negative effects of this initiative:

> *The Marines propped up a series of light-skinned puppet regimes and established an Army that suppressed and killed the opposition, displaying the crucified corpse of resistance leader Charlemagne Peralte. By destroying resistance, the Occupation thus removed barriers and safeguards against future dictatorships* (2007:149).

Another culturally oppressive move by the U.S. during this period was the declaration by Franklin D. Roosevelt that French was to become the national language of Haiti (Schuller 2007). French, the language of Haitian elite, ensured that rural peasants (the vast majority of whom spoke Haitian Creole) would not be able to hold political office or partake in business transactions.

While the U.S. came to Haiti under the pretext of increasing stability, their actions ultimately fostered violence, instability, and the formation of the Duvalier dictatorship in the Post-Occupation Era. Mintz reiterates the negative impact of U.S. Occupation on Haiti:

> *The present situation (of class warfare and inequality) is the outcome of 200 years of a war of attrition against the people by a ruling class. U.S. rule early in this century confirmed, sustained, and underwrote that asymmetry* (1995: 86).

While such political aspects may not initially appear related to deforestation and soil loss, many connections can be drawn. The aforementioned international influences culminated in a dictatorship and increased disaster vulnerability that perpetuated a cycle of poverty and environmental degradation in rural Haiti during the Post-Occupation Era. Initiating Factors and Catalyzing Factors have influenced this cycle, which I call the Pwoblem Pyebwa Cycle, seen in Figure 3.3.

4. Post-Occupation Era

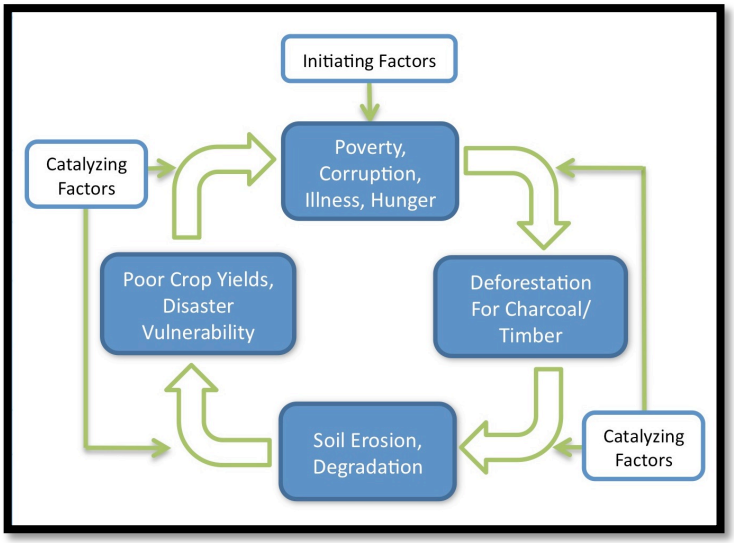

Figure 3.3. *Pwoblem Pyebwa* Cycle (excerpt from *Pwoblem Pyebwa* Model)

4a. *Pwoblem Pyebwa* Cycle: Systematic Causation Through Initiating and Catalyzing Factors

The *Pwoblem Pyebwa* Cycle that has impacted Haiti throughout the Post-Occupation Era does not act independently of the historic influences discussed in previous eras. These influences, which I call Initiating Factors, still affect the lives of rural Haitians through systemic causation (Lakoff 2012). Direct causation cannot be drawn between the history of Haiti and its current status, but this is not because things like embargos and foreign occupation did not cause the environmental damage and poverty seen today. Instead, the systemic causation is more complex. Lakoff (2012) explains this type of causation as similar to smoking causing lung cancer or driving drunk causing car accidents. He argues for the importance of recognizing systemic causation when understanding connections between society and the environment:

> *Systemic causation, because it is less obvious, is more important to understand. A systemic cause may be one of a number of multiple causes… It may be indirect, working through a network of more direct causes… It may require a feedback mechanism. In general, causation in ecosystems, biological systems, economic systems, and social systems tends not to be direct, but is no less causal. And because it is not direct causation, it requires all the greater attention if it is to be understood and its negative effects controlled* (1).

Under this mindset, Initiating Factors continue to cause environmental degradation and poverty through the *Pwoblem Pyebwa* Cycle of Haiti. These Initiating Factors, seen through the previous three eras, include Post-Colonial Foreign Relations (reparations, embargos, funding corrupt leaders), Foreign Occupation (forced work parties, sugar plantations, militarization), and Loss of Indigenous Stewardship (disease, slaughter). I argue that after these influences initiated the *Pwoblem Pyebwa* Cycle, Catalyzing Factors have continued systemic causation of the Cycle. Catalyzing Factors linked to deforestation in ethnographic literature include Hurricane Hazel, The Duvalier Dictatorship, Post-Duvalier Recoil, Changes in Livelihoods, and Urbanization. Novel categories of Catalyzing Factors identified by research partners include Water Tenure/Water Access, Commoditized Goods and Serves, Pig Eradication, and Climate Variability.

4b. Hurricane Hazel and Disaster Vulnerability

Of the Catalyzing Factors (those impacts that strengthen and accelerate the *Pwoblem Pyebwa* Cycle), I have found natural disasters and increasing environmental vulnerability to be among the most influential. At the simplest social-ecological level, tree loss leads to increased vulnerability to hurricanes and soil erosion. Soil erosion and poor crop yields then lead to a need to cut down more trees. Lastly, cutting down trees to sell for charcoal continues the cycle of tree loss and vulnerability. Along with soil, buildings, and livestock, hurricanes also sweep away trees themselves. This tree loss was particularly evident with Hurricane Hazel in 1954.

Hurricane Hazel hit Haiti on October 12, 1954 as a Category 2 storm. Moving north, it left an estimated 1000 Haitians dead. This toll compares to a loss of 95 lives in the United States, despite the storm rising to a Category 4 level before landfall. Such a disparity in impacts from Hurricane Hazel supports the idea that Haiti was particularly vulnerable to natural disasters by the 1950s. Moreover, this hurricane uprooted large areas of trees, and scholars have linked this tree loss to the beginning of increased deforestation following the storm (Williams 2011). Through processes of the *Pwoblem*

Pyebwa Cycle, this loss of tree cover (combined with economic strain and disease outbreaks) systemically increased disaster vulnerability in Haiti.

Hurricane Hazel impacted the Haitian economy through loss of crops. More specifically, 40% of coffee trees and 50% of cacao trees were destroyed, injuring two of Haiti's largest sources of export at the time (Rotberg 1971). Researchers have also linked Hurricane Hazel to increased disease vulnerability, seen through the typhoid outbreak that soon followed (Kennedy 1979). When looked at in conjunction with my qualitative research, in which research partners discussed medical costs and funerals as two of their most common reasons for cutting trees and making charcoal, Hurricane Hazel seems to have catalyzed the *Pwoblem Pyebwa* Cycle and increased disaster vulnerability.

Events since the 1950s have supported the idea of Haiti's high disaster vulnerability. In September of 2004, Hurricane Jeanne pummeled Northwest Haiti, killing 3000 people in one night in the city of Gonaives (Latortue and Vazquez 2006). Six years later, in 2010, a magnitude 7.0 earthquake decimated the nation's capitol city of Port-au-Prince, killing more than 300,000 people (Farmer 2011). These disasters appear like random happenings that fell upon an already burdened country, which is generally acknowledged as the poorest of the Western Hemisphere. Yet, looking at similar events across other countries demonstrates the heightened vulnerability of Haiti to disasters. For example: an average of 15 earthquakes of a 7.0 magnitude or higher occur each year, but the 2010 Haiti Earthquake remains the deadliest earthquake since 1556 (USGS 2012). Likewise, Hurricane Jeanne passed directly over Cuba and the Dominican Republic, but no lives were lost in Cuba, and only 18 were lost in the Dominican Republic, Haiti's only neighboring country (Bermejo 2006).

Not much has been written about Jeanne, possibly because it primarily attacked the sparsely populated Northwest. Yet, interviews with rural peoples of Anse Rouge (and other regions, to a lesser extent) demonstrate the far-reaching impacts of Hurricane Jeanne, which continue today. From my very first interview in Haiti, research partners discussed Jeanne without prompting. This Jeanne discussion

included interjections during discussions of life experiences, families, animals, crops, tree cover, and the need to make charcoal. The excerpts below (each from separate research partners) and Figure 3.9 show the impacts experienced from Hurricane Jeanne in the Anse Rouge area:

> *- So after Hurricane Jeanne I pretty much lost everything. So I do not really have any ways of living… That is when I started from scratch again.*

> *- After the hurricane, I lost all I had. Before that, I had three farms with sugar cane, papaya, and plantains. But the hurricane destroyed everything. And then I was left with my two hands having nothing.*

Figure 3.9. One of many homes seen destroyed by Hurricane Jeanne along the Anse Rouge coast

More specifically, people linked this storm to their loss of livelihood. They focused on loss of livestock, which act as financial investments for liquidation in times of hardship:

> *- I had six goats and the hurricane vanished them away.*

> *- The hurricane swept away my livestock and also destroyed my house… it swept away my donkeys and my goats.*

Others identified the impact of Hurricane Jeanne on soil erosion. They linked this impact to decreased crop productivity, loss of livelihood, and a general state of misery:

> *- Now I don't have any way of building a life because the hurricane even vanished my soil. So even my land now, it is not arable. Now I am only relying on God and* (local NGO).

When asked about why people cut down trees, partners often linked this idea back to hurricanes in general and Hurricane Jeanne more specifically:

> *- I think there are a lot of issues because people don't have anything to do. That's why they are forced to cut down trees to make charcoal. And after Jeanne, I had eight plots of shallots, and I lost them. I did not have anything the next day to cook food. That is why a lot of people believe it may have been God will, but they do not have anything more to survive.*

Along with discussion of the negative impacts of hurricanes, many rural Haitians I interviewed acknowledged the importance of trees to protect against such hurricanes. They informed me of how having trees on their land means protection of their house, livestock, and crops during storms. This discussed this fluidly, not making distinction between social and environmental systems. They also explained the role of trees in holding soil, acknowledging that during these storms "trees stand strong and protect the environment." When asked further about soil loss, research partners assured me that soil erosion began long before Hurricane Jeanne. Some cited shifting environmental regulation, political turmoil, and economic decline following the reign of "Papa Doc" and "Baby Doc" Duvalier.

4c. Duvalier Dictatorship and Post-Duvalier Recoil

Most sources agree that the Duvalier dictatorship from 1957 to 1986 left a negative mark on Haiti through fear, violence, corruption, inequality, and the erosion of the national economy (Abbott 1998; Farmer 2003; Farmer 2004; Smith 2001; Schuller 2007). These negative aspects include 20,000 to 50,000 political killings attributed to the reign of Papa Doc and thousands more during the reign of his son (Smith 2001). Sources also discuss the role of outsiders, particularly the U.S., in this regime. Farmer (2004) notes how international donors funneled millions of dollars to the Duvalier's, Papa Doc and Baby Doc (who declared himself "President for Life" at age 19). Anthropologists devote whole books to the Duvalier dictatorship and political violence (see Trouillot 1990 and Abbott 1998). Instead, I focus here on an aspect not commonly addressed in the literature: how the dictatorship and its aftermath impacted environmental health and deforestation.

Little has been written on the direct impact of this time in Haiti's history on the environment, but research partners have expressed both predicted and unexpected opinions on the matter. Some rural Haitians claimed that the rule of Papa Doc and Baby Doc was good for the environment, since everyone was required to get written governmental permission to cut trees on their land. Yet, most people lamented the negative aspects of the dictatorship and its aftermath. Partners commonly cited

this time period as the economic downfall of Haiti, when the rural way of life became unviable and cutting trees for charcoal sale became a necessity in response to the economic damage done by the regime. This suggests that deforestation slowed during the rule of Papa Doc and Baby Doc but ultimately accelerated after regulations were lifted.

Literature and knowledge from rural Haitians support the idea that the time period following the Duvalier dictatorship led to urbanization, loss of land, increased inequality, shifts in fuel use, and increased vulnerability. These factors acted as a set of interconnected processes that I call the Post-Duvalier Recoil. Authors have attributed this turmoil partly to the self-centered policies that began with Papa Doc, who increased personal wealth at the expense of a nation. Diamond, when exploring why Haitian deforestation has far surpassed that in the Dominican Republic, explains the different types of rulers involved, "Papa Doc Duvalier differed from Trujillo (Dominican dictator) in his lack of interest in modernizing his country or in developing an industrial economy for his country" (2005).

This self-interest continued throughout the time of Baby Doc and ultimately led to lack of social services, hospitals, and schools. In response, rural Haitians increasingly found they could not provide for their families through farming, and a mass migration to cities began. Estimates for Port-au-Prince support this trend, with the capital city's population doubling from 500,000 in the 1970s to over one million by the late 1980s. This shift came largely from an economic decline, with households averaging an annual income of only $100 by the ousting of Baby Doc in 1986 (Dash 2001).

Government-sponsored violence during the Duvalier regime also contributed to this exodus from rural areas. *Tonton Macoutes* (named after a Haitian character similar to the Boogeyman) became notorious for their violent ways. This violence caused property owners to leave dangerous areas, many of which fleeing to the United States. Those migrating included rural business owners involved in large-scale coffee farming, and their departure has been linked to the declining rural economy (Fischer and Levy 2011). *Tonton Macoutes* used this exodus and the lack of officially acknowledged land tenure to

acquire rural land and push farmers off their property (Dash 2001). Fear and declining productivity replaced the once peaceful and productive agricultural lifestyle of rural Haiti in many areas. My qualitative research supports this trend in the decreasing viability of rural livelihoods, which continues to this day and systemically increases deforestation.

4d. Changes in Livelihoods

One of the main themes to emerge during my research was the change in livelihood activities over the lifetimes of research partners. Research partners identified a few key ways in which their livelihoods were changing. These changes include less viability of the farming lifestyle, an increased need for alternatives to crop production, and eventual urbanization when the agricultural lifestyle becomes too difficult to support families. Research partners commonly linked these changes to changes in the environment and cited livelihood changes as causes and/or effects of deforestation in their lifetime.

Partners frequently spoke of the changing viability of their lifestyle as a farmer. They used examples from the time of their parents to reiterate the increasing difficulty. Most commonly, the previous ease of finding or growing food was given emphasis, with some people explicitly discussing the role of deforestation and soil erosion. One middle-aged woman with toned arms and braided grey hair used a specific example from her life to explain these changes. She described the difficulty in losing her shallot crops (which she depended on to pay all of her expenses) to decreased soil quality and erratic rainfall.

> *In May, I planted shallots again. I lost them. Back in the days, life used to be good. But now, even though you spend a lot of money to try to cultivate, you spend more than the outcome you will get… But back then, if you could have a penny you could make something out of it… Back then, before ten years ago, if you plant a can of beans you would get twenty out of it, but now, even if you plant one can, you get lucky if you get one and a half back.*

A middle-aged Voodoo priest/farmer used similar examples, saying, “There is a big difference, a big gap, because previously a smaller proportion of shallot would give a lot but now it is not the same.”

The recognition of these changes traversed across generations, as seen in the similar responses from respondents aged 18 to 90. One 90-year-old woman, who spoke with surprising vigor and humor, explained the changes:

> *You could find everything you needed, and you could just pick them up from the floor (of the garden). Mmm hmm. You could go to the land and get bananas, plantains, and you could go and get potatoes. You could get bags of oranges. But now it is not the same.*

While outsiders may argue that these memories are just exaggerations and nostalgic thoughts of older generations, the consistency of these reports across all age groups supports their validity, as seen in the words of this 18-year-old farmer when he described his memories of early childhood:

> *Back in the days things were easier because sometimes you would walk along the street and find stuff that you had not even planted. So now even though you take the time to plant it, you can't get anything from it.*

Not only farmers, but merchant woman also discussed the decreased viability of rural life in Haiti. One mother of nine described the increased difficulty in supporting a family as a vendor: "Back in the day I used to go to the market and make 50 goudes (about 1 USD) and then come back home, but now I only go because I do not want to stay at home and get sad." This and other discussions with vendors suggest that changes in land productivity spread to the wider economy of rural Haiti.

Triangulating these locally defined changes with changes in soil productivity supports the validity of this qualitative research. Researchers cite massive soil erosion in Haiti as early as 1938 (Lundahl 1979) and exponential increase in this erosion over the last 25 years (Brenner and Binford 1988). Currently, Haiti looses an estimated 36.6 million tons of soil (12,000 hectares) every year (USAID 2010). This occurs despite barriers installed to prevent soil loss (seen in Figure 3.10). This loss compares to an

Figure 3.10. Barrier used to prevent erosion near Deschapelles

estimate of 7 million tons in the 1930s, leading researchers to conclude, "The soil loss experienced in Haiti far exceeds that which can be considered sustainable soil loss that would allow for soil regeneration" (Jolly et al. 2007). These outsider-observed trends, when combined with the lived experiences of rural Haitians, support the idea that deceased soil productivity over the Post-Occupation Era has limited the viability of the farming lifestyle in rural Haiti. My research also supports the idea that these trends result in increased urbanization, increased need to cut trees for charcoal, and decreased tree cover in rural Haiti.

4e. Urbanization, Population Growth, Decreased Agricultural Output, And The Rise of Charcoal

Currently, 85% of Haitians rely on wood fuels (charcoal and firewood) as their primary fuel source (Dolisca et al. 2007). Many factors have impacted charcoal use in Haiti, and my research supports the idea in literature that urbanization has heavily catalyzed deforestation for charcoal production. This impact of urbanization on deforestation comes from the high reliance on charcoal in urban areas. Swartley and Toussaint (2006) support this idea by noting that 90% of households in Port-au-Prince and other cities in Haiti use charcoal for cooking, since dried wood cannot be found. Comparing this high reliance on charcoal to historical causes of urbanization and the lived experiences of research partners illuminates connections between urbanization, population growth, decreased agricultural output, and deforestation for charcoal production.

Williams (2011) connects the rise of charcoal in Haiti to increased urbanization beginning in 1954. Qualitative research with rural Haitians suggest that this urbanization came largely from Hurricane Hazel (also in 1954), the Post-Duvalier Recoil, and the changes in soil productivity that have made sustaining a rural livelihood more difficult. Deceased agricultural output simultaneously catalyzes urbanization (which increases the demand for charcoal) and increases the need for cash in rural Haiti. Population growth, at a rate of 2.5% overall and 3.6% in urban areas like Port-au-Prince, has also

increased the demand for charcoal (USAID 2007). Left with no other option, rural Haitians have been forced to turn to their last available resource: trees.

When I talked about charcoal production with research partners, I could sense pain in their words and gestures. Even getting people to discuss the topic was sometimes difficult. This difficulty was especially true for those farmers that had been chastised by outsiders for cutting trees. Only after accepting that I did not come to their village to change their ways but only to learn from them did some individuals feel comfortable enough to tell me they practiced charcoal production in times of need. As a whole, research partners simultaneously expressed the importance of trees and the unfortunate need to produce charcoal as their only means of survival.

Throughout my interviews, one of the most common phrase I encountered when talking with Haitians about trees was "*pyebwa yo se lavi*!" meaning "trees are life!" Research partners typically included energetic hand gestures and voice inflections to accentuate this point. While this phrase could be seen as a colloquialism used when discussing trees, the inseparability between trees and life radiates throughout rural Haitian culture. Some partners used examples and even a sort of fictive kin relationship to describe their appreciation for and connection with trees. One mother of nine with dimpled cheeks and a contagious smile described her connection, "I don't know for everybody, but for me, if I go and plant two trees and then someone goes and cuts them, it is like they are hurting me, because I treat them (the trees) as my children." This and similar local input challenges the notion that Haitians cut trees out of ignorance or apathy.

Instead, spending time listening to rural Haitians shows that cutting trees for charcoal comes as an unfortunate last resort for most charcoal producers. Research partners frequently used the terms "surviving", "being in misery", and "trying to get by" to explain their charcoal production in desperate times. People gave emphasis to examples of financial need, including paying for school, funerals, medical care, or house repair after hurricanes. The lack of alternative income sources in times of poor

crop yields was also cited. According to locals, all such influences increase deforestation (thus acting as Catalyzing Factors for the *Pwoblem Pyebwa* Cycle). One man described charcoal and deforestation as follows:

> *People don't have any other means. If we had other stuff to do I'm pretty sure we would not be cutting trees. For example, I am not going to cut down trees because I have other activities (temporary employment), but if people do not have any other activities, they do not have any other way. They have to rely on what they have, and then what they have is to cut trees so they can make a living.*

Such local input provides insight into the social-ecological processes impacting deforestation in Haiti. Improved understanding of Catalyzing Factors in the cycle of Haitian deforestation can help Haitians and outsiders collaborate to slow tree loss by targeting those factors that perpetuate this cycle. Research partners from my time in Haiti have contributed to this knowledge by assisting in the identification of Catalyzing Factors not previously associated with deforestation in outsider literature.

Novel Categories of Catalyzing Factors

My research with rural Haitians has supported some outsider conclusions about Haitian tree loss. These include Murray and Bannister's (2004) discussion of lack of alternate income sources, Williams' (2011) discussion of urbanization, and Lundahl's (1989) discussion of embargos. In addition to these insights, my iterative research on the *Pwoblem Pyebwa* Cycle provides novel categories of Catalyzing Factors that broaden understanding of deforestation in Haiti. The novel categories most stressed by residents include commoditized goods and services, water tenure, pig eradication, and climate variability.

4f. Commoditized Goods and Services

Many research partners, when asked about changing relationships between humans and trees during their lifetime, highlighted the increased reliance on purchased goods and services that they once found in the environment and traditional social interdependence. Neoliberal agricultural policies and food aid have resulted in drastic changes in purchasing of foreign food. This reliance can been seen

through the percentage of food imported in Haiti, switching from 19% in 1970 to its current level of 51% (Dupuy 2012). Such a change means that money must be used to purchase food instead of growing crops for consumption and monetary gain.

Farmers frequently discussed with me the changing food situation in Haiti. They lamented the increase in foreign "chemical foods," as they call them. Looking at post-earthquake events shows the recognition of these potentially harmful trends by rural Haitians, with thousands of farmers burning genetically modified seeds given by agrobusiness giant Monsanto (Bell 2010). Locals also discussed the impacts of this commoditization of food and the consumption of processed food goods. Many people linked this change to increases in illness among their villages. Such a shift in diet has become so pervasive that many research partners note how their children will not eat the nutritious *pitimil* grain (millet) grown around the *jaden lakou*. Instead, they prefer the taste of U.S. rice, which sells for significantly cheaper than local grain products and is less nutritious.

Figure 3.11. Can from imported oil in a dry field where *pitimi* no longer grows

Increases in food purchase, the commoditization of services like education and medicine, and decreasing economic value of locally grown foods has resulted in increased need to cut trees for charcoal and subsequent vulnerability to disaster. Outsiders have used such vulnerability as a justification for more food aid, the promotion of Western farming methods, and outside intervention. These outside interventions, regardless of intention, have sometimes caused increased poverty and increased deforestation (Smith 2001; Schuller 2012). To most rural Haitians in my research, the most notorious of these interventions has been the extermination of Haiti's pig population during the 1980s.

4g. Pig Eradication

In 1982, the U.S. Government led a "development" initiative in rural Haiti to protect people from the African swine fever. Even through Haiti's Creole pigs demonstrated a resistance to the illness, nearly all 1.3 million Creole pigs were slaughtered (Farmer 2003). These swine, specifically adapted for the mountains of Haiti, were replaced with white pigs from America that quickly died in the harsh terrain. Since rural Haitians relied heavily on these pigs both for sustenance and as a method of saving capital, authors have since referred to this event as the "Haitian peasant's Great Stock Market Crash" (Smith 2001). Smith's (2001) ethnographic study in the Central Plateau presents peasant songs recalling this event and its impact on the livelihoods of rural Haitians. Smith replicates the following song about The United States:

> *The Americans have us by the throat, ohhh,*
> *Uncle Sam is strangling us, ohhh*
> *Because we're small, they take us for nothin',*
> *But we solemnly swear we won't live like zombies!*
> *They killed our Creole pigs and gave us their old white pigs*
> *They force us to get rid of our little chickens and then hand us chicken feet to sell*
> *Who's doing this to us? Uncle Sam, ohhh!* (2001:59)

The event does not live on in song alone. Since the swine flu slaughter, peasants in rural Haiti have relied heavily on goats as livestock. While these small ruminants provide meat and milk, their voracious foraging habits have led to loss of crops and repeated failure of tree planting efforts (Baro 2002; McClintock 2004). To reduce this destruction, farmers have begun tying up goats to small thickets of brush, but "Because the animals are generally not tethered in cropping areas, manure nutrients are not cycled back to the areas of the highest nutrient uptake" (McClintock 2004:15). Through this social-ecological system, an international influence from 1982 continues to systemically impact both the livelihoods and environment of rural Haiti.

The impact of the United States on Haitian livelihoods also stretches past pig killings. American influence includes creating embargos (early 1800's and 1991-1994) that harmed the rural poor,

financially supporting murderous leaders, training and funding the corrupt Haitian Army, occupying the country for two decades, and playing significant roles in coups of democratically elected presidents (Farmer 2003; Farmer 2004; Dash 2001). Roc (2008) relates the 1991-1994 embargo to a rapid increase in deforestation, but research has not shown direct causation between these events and human-environmental interaction. Yet, since political instability and degraded economics leads to increased environmental degradation and decreased food security (Baro 2002), history suggests that international influences have had large impacts on Haiti's environment and the way people interact with it through systematic causation (Lakoff 2012).

Academic sources have repeatedly discussed the impact of this pig eradication on the Haitian economy (Smith 2001; Dash 2001; Kidder 2003), but only when connecting this event with the lived experiences of rural Haitians can social-ecological connections be drawn. Research partners repeatedly gave emphasis to the issue of goats eating crops and intentionally planted tree saplings compared to the less destructive eating habits of pigs. In a response to this issue, one partner made the following recommendations, "if I was president, I would say everybody should just put a rope on the neck of the animals to keep them away from the garden, out of others."

I observed the uncanny ability of goats to enter the most protected of gardens. Despite seven strands of barbed wire fence (a resource too expensive for the average farmer), goats entered the NGO funded tree nursery and ate saplings during one of my trips to a town near Tiplaz. Some villages, including Lagon, had stricter norms about tying up goats. These norms varied across locations, but all areas complained of tree and crop loss from stay goats. The majority of research partners discussed this novel category, which was unknown to me before my field research. Most people discussed goats, but every person I met with in the Anse Rouge region talked about water, either in terms of water tenure/water access or climate variability.

4h. *Pwoblem Dlo*- Water Tenure/ Water Access

Land tenure did not seem to pose much of a threat to forest cover in the regions visited during my research, and it was particularly not an issue in the Anse Rouge area. Nearly all people owned land, and those that did often owned multiple parcels of land. Some owned more than ten parcels and actively planted trees on those plots that were furthest from their home. One man in his 80s had covered his land in trees so that he would have an income even when he became too old to farm. And yet, despite this high availability of land in the Northwest, 36% of the charcoal in Port-au-Prince comes from this area (Smucker 1981). Learning from Haitians showed that the impact of water tenure (ownership of rights to irrigation water use) and water access (availability of irrigation water in the area) in rural Haiti surpassed the impact of land tenure on deforestation. This impact was seen in all study sites, but it was most pronounced in the remote and dry Anse Rouge area.

Research partners gave emphasis to this issue (often referred to as *pwoblem dlo* or the "water problem") in nearly all Anse Rouge interviews and many interviews of other regions. At the most general level, those who owned rights to irrigation water did not rely solely on rainfall. This diversification allowed for the production of crops and the planting of trees regardless of natural conditions. Those without ownership of water rights either had to purchase allotments of water (for which they needed cash and often resorted to charcoal production) or simply rely on natural conditions. According to research partners, reliance on natural conditions has become difficult with increasing unpredictability of climate.

4i. Climate Variability

For most of their lives, research partners who relied solely on rainfall for crop production could feed their families through generally predictable patterns in climate. Decades of soil erosion have slowed their crop productivity, but the soil generally allowed for enough food to eat and some to sell each year. Participants in my research reported that this productivity has decreased over the past 5 to

10 years to the point where they can no longer provide enough food to eat, let alone sell. They discussed multiple factors contributing to this decrease, such as soil loss, *cheni* (caterpillars), *AIDS* (the local name given to shallot-eating grubs, because "They are the worst!"), and crop loss to livestock. More often than all of these factors combined, research partners in the Anse Rouge area identified lack of rain as the primary cause of poor crops yields and the need to cut down trees. This year may seem like an anomaly, but many rural Haitians also discussed unpredictable changes in climate, in which rain only comes at bizarre times and in extreme amounts.

When asked about empty plots of cropland or groups of saplings sitting in reused plastic bags, ready to plant, farmers would explain they were "waiting for the rain" or *"lapli pa tonbe"* (the rain doesn't fall). I quickly identified the trend of this Creole phrase in conversation, and remained alert to its presence. While transcribing interviews, it became obvious that "*lapli pa tonbe*" was spoken more than any other phrase with "*pyebwa yo se lavi"* or "trees are life" coming in a close second. Many research partners also addressed the connection between these phrases, linking less rainfall and higher temperatures to tree loss and such climatic changes to increased need for cutting trees. One farmer explained this cyclic deforestation as follows:

> *When I was born, it was very good around here. There was a lot of food… a lot of food. It was real green, and there was more shade and more water. The temperature was cooler. So, as a result of what happened to the environment, its different now. Life is harder because of wind, less water, and less trees. Back in the days people did not cut trees the way they have been cutting them down right now, and that is the reason why the environment has changed.*

Other research partners elaborated on the many ways lack of rain, hotter temperatures, and varied precipitation patterns have impacted their life. On each of my visits to different areas, they would impress me by recalling the exact date of the last rainfall. Even when we discussed other issues, rain would enter the conversation. One Lagon man, who was quite tall (rare in Haiti) and donned a large beard (also rare), replied to my by saying, "This year there is no rain and *all* that we planted is lost! And now, we do not know where to find seeds to plant this year." Another man, who I called "Peppy" in my

notes because of his chipper attitude and abundance of energy, ran the local tree nursery. He explained to me quite emphatically how every seedling had died from lack of rain. In Deschapelles, an older farmer explained that the drought had slowed the growth of fruit and he could not sell his unripe mangoes that he depended on for income. In Ti Bwa, a woman who cleaned NGO buildings to make up for her lost income explained, "The sun is burning the garden, the *cheni* attacks our plants, and I do not have enough money to buy what I want to plant."

Just as Berkes (2008) explains the connection of resource users to feedback loops from the environment, rural Haitians demonstrated their awareness of the impact human actions had on natural processes and visa versa. This awareness was particularly evident during one day of field research in Lagon. While walking the steep farming plots that surround the town, the farmer to my left pointed to a patch of burned land and explained the cycle of land drying, "When you burn it, this year you can find more food on it, *but*, it is not good for the land because it makes the land become really dry. Drier and drier." One of his neighbors, an elder man named Franz, then contributed to the conversation, "And people are cutting down a lot of trees and that is why it is getting warmer, too."

Later that evening, we took the last hour of light to meet as a group and informally talk on the hillside. Five others joined us, including Peppy, who described a reforestation project beginning in the area:

> *We know the trees allow rain to fall. And if we have rain, we can grow a lot of things in our gardens. So, we pray to God constantly to make this project benefit for us by planting a lot of trees, not cutting them down, and we will have rain to farm.*

The bearded man and Franz then exchanged thoughts about what they would do if another dry season came. The former said he would leave the country. Mistaking his meaning, I asked which country he would go to. To which he replied:

> *If it does not rain in this area, it is not that I will leave the country like that but leave this area. Because I do not have money for a passport, visa, or a means to go to other countries. I can live in a city. I can go to Gonaives or Port-au-Prince to try to find something to do.*

Before parting ways, jokes made their way around the group. The circle of farmers reminisced on some of my silly questions, like when I asked if palm trees could be used for charcoal. They corrected me on my overuse of the word "*bon*" (good) in response to each question and mimicked my voice, saying "*bon, bon, bon!"* We then talked about facial hair, and they made fun of the bearded man. I tossed back that they were just jealous of our fertile faces (me with a thick red/brown beard by this point). I said we just had the best land and asked the bearded man what kind of crops he was trying to grow on his chin. The group erupted in a fit of laughter, and I felt surprisingly welcomed by these rural farmers for a *blan*.

I asked for a joke, telling them I heard Haitians knew the best jokes. Franz spoke up and told a story that demonstrated the concerning nature of the drought and the Haitian *jwa de viv* (joy of life). He said, "A little while ago, maybe last month, I talked to somebody and he said 'It is not raining this year, maybe God forgot us.' and I said 'No, God is here, because I saw him in *Okap*.'" I did not think the joke had finished, but the group once again erupted in laughter. Noticing that I was only laughing because everyone else was, Peppy explained that *Okap* was slang for Cap Haitian, a city to the North, and that it has rained some there over the last month. Peppy then added the joke's second punch line, "And he was probably only there because he was in Dominican Republic and decided to stop by for a quick visit." We parted ways, and I left Lagon thinking of the Haitian joy for life, the abundant rain and forests of the Dominican Republic, and the complex factors influencing Haiti's historical deforestation.

Conclusions

"Of course background facts do not tell us what to do about Haiti. But not knowing them has led to some plans for Haiti that make relatively little sense of what is possible. Haiti's current crisis then, is historical."
(Mintz 1995:73)

I have been trying to figure out why Haiti has lost so much of its tree cover since I first walked the denuded mountains of Haiti's Central Plateau in 2007. Early on in this journey, my outsider mindset and explanations from people with similar life experiences impacted my view of deforestation in Haiti. Without understanding Creole and with training in positivistic Western science, I relied on only one type of knowledge source: outsider-generated content. Through qualitative research, I have found rural Haitians to possess a wealth of knowledge about their environment.

I witnessed this knowledge through my daily interviews and my nightly walks. I would *"fe yon ti vire"* ("take a little turn") down the streets of Tiplaz, Lagon, Bonnal, Ti Bwa, and Deschapelles, point to trees, and ask people what species they were. Everyone knew. Not only that, but they could tell me what that particular tree was good for, what it was not good for, what conditions it grew best in, and why it was important in their life. In retrospect, I now notice just how impressive this knowledge is. While rural Americans may have similar knowledge for trees in the United States, the results would be much different if I were asked about the uses of such trees. This supports the idea that local Haitians possess a wealth of locally specific knowledge.

My research in rural Haiti supports the idea that this local knowledge of the environment should be included in project planning if reforestation initiatives are to have lasting impact on tree cover. I also argue that outsiders must understand the systemic historical causes of deforestation and look past the common explanations used to explain Haiti's tree problem. I present the *Pwoblem Pyebwa* Model as an educational tool to understand this problem. To me, this model represents collaboration between two types of knowledge. Publications from outsiders contribute soil data, figures on tree loss, and synthesis from Haitian deforestation experts. The *Pwoblem Pyebwa* Model also contributes knowledge from the

other experts on this deforestation: rural Haitians. Through experiential learning and generations of informal experiments, Haitian farmers possess knowledge on trees and human interaction with trees that have contributed to this model. The *Pwoblem Pyebwa* Model, a product of iterative field research, both explains Haitian deforestation and supports the idea that Haitians and outsiders can work together to improve the tree problem in Haiti.

CHAPTER 4: *PYEBWA YO SE LAVI*: TREES ARE LIFE!

Introduction

Throughout my research in Haiti, research partners provided extensive lists, discussions, and examples of the various uses of trees in their lives. Many of these came as no surprise, either since they were highlighted by previous studies or easily related to life in the United States. This includes use for charcoal (discussed in-depth by Smucker (1981), Stevenson (1989), and Timyan (1996)) or use for timber (seen in the U.S.). Others came as a surprise, either because outsiders do not generally acknowledge the use (spiritual protection) or because rural Haitians stressed a use far beyond what I expected its importance to be. I learned much from interviews with research partners, but I found that my depth or understanding increased most when applying concepts from interviews to participant observation. For this reason, I incorporate vignettes from observations for some of the locally identified tree uses.

The most locally valued tree uses seen in my research include shade, food, bringing of rain, preservation of water sources, protection against hurricanes, preservation of soil, medicinal uses, and spiritual protection. These are shown in Figure 4.1, with different arrow sizes showing the importance of different tree types for various tree uses.

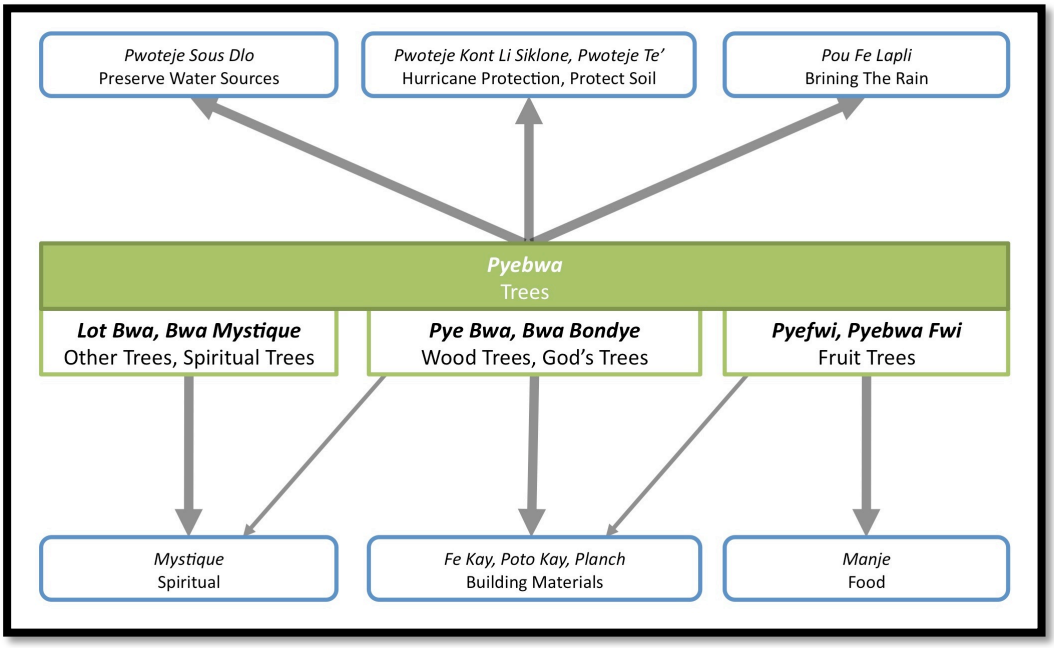

Figure 4.1 Tree Uses From Different Tree Types

Previous studies have discussed the general importance of some of these tree uses in Haiti. This includes Timyan's (1996) book that breaks down uses of different species and includes mention of shade, food, and medicinal uses. Yet, current agroforestry projects and studies on Haitian reforestation have focused mainly on the uses of trees for economic gain (Balzanc 1986; Murray and Bannister 1988; Current et al. 1995). I have found this mindset to be an improvement from the earlier emphasis on conservation instead of local needs, as discussed by Murray (1986), but I argue that outsiders still have much to learn about Haitian tree use. For this reason, in this research I sought out those uses of trees in rural Haiti not directly related to the market economy. Charcoal production, timber sales, and fruit sales were mentioned by research partners, and I discuss them where they were given heavy influence, but these uses were not given as much emphasis as those uses not for profit. These non-market uses may not seem important to business models or outsider understanding, but research partners seem to give them equal or greater importance. To my surprise, emphasis on the importance of trees for shade outweighed all others described by research partners.

***Umbwage*- Shade**

For my first interview in Haiti, I met with Odette, who worked as a maid for an NGO in the area. Sitting in plastic chairs and cooled by an oscillating fan, we discussed her family, my role as a researcher, the happenings of the day, and life in Tiplaz. We slowly worked our way into discussing the environment, trees, and what trees meant to her and her family. Odette made the whole process easy, informative, and enjoyable with her loquacious nature and contagious smile.

Despite being my first interview in the area, I had an idea of what she would say from my observations: "we use trees for houses"… or "I gather mangoes and sell them"… or "we use trees as natural fences around our gardens". Yet, without pausing to contemplate, Odette responded to my inquiry by saying "*umbwage!"* meaning, "shade." I had not learned the word when looking up potential responses for this question, and looked to the translator present for clarification. Odette continued:

My family plants a lot of trees and flowers in our yard, and we let them grow so that the next day they will be beautiful. We utilize them for many purposes. For example, we have a couple neem *trees around our house. And if you go to my house right now, you are not going to leave because of the shade.*

Before she had finished, I had mentally moved on. I thought to myself, "Ok, shade. Trees make shade, but that cannot be that important of a use. We enjoy shade in the U.S. too, but I would not have mentioned that." I then tried to steer the conversation to what my life experiences deemed to be more tangible tree uses. Fortunately, Odette's emphasis on shade (similarly true with other research partners to follow) shook me out of my outsider mindset. In the weeks to come, through participant observation and the teachings of research partners, I came to appreciate just how important shade from trees was to regulate temperature in the lives of rural Haitians. Research partners from every region discussed shade as one of the most important uses of trees, but this importance was especially true in the dry, hot, and low-altitude Anse Rouge Area.

It was not until I experienced the cooling effect of trees in Rivye Froide (a town in the more mountainous portion of the Anse Rouge Area) that I could personally relate to the importance of shade. This visit also demonstrated many other uses of trees. These uses include water source preservation, soil prevention, and spiritual protection. Some of what I learned on this trip came from Sandra, an NGO worker travelling with me that day. Some came from the economic questions asked by three business students also present. Most, however, came from Papi, an elder who welcomed us into his forest at the day's end. To better relay the impact of this visit on my understanding, I present my observations from a personal viewpoint.

***Umbwage* Observed: Papi's Forest**

As we approach Rivye Froide in our diesel, four-wheel drive vehicle (a necessity on that road, the most precarious I have seen), Sandy tells me that the village is quite motivated but too remote to establish projects in. We travel up a dry riverbed, and I am struck by how dry, very dry, and hot the town

feels. I see few trees in this area, mainly bushes. Sandra tells us there is no tree nursery in the area, but we later find out that the community has been running a nursery on their own, without NGO intervention.

We get out and walk, and I notice that there are actually a lot of fences in the area, good fences. I am told by our Haitian guide Nedal, a school teacher in Rivye Froide whose tall stature makes him easy to follow through the fields, that they are all locally made. None are done with wire, which Nedal says would provide a higher quality fence that more effectively keeps goats out. Because of their remoteness, the people of Rivye Froide seem to have to do things themselves. This ingenuity includes using agave stalks to form fences around gardens and areas of tree growth and to plant their own tree nursery.

We talk with Nedal, who says he has a tree nursery, which is private and not funded by NGOs. A member of our group asks Nedal what kind of trees people request most in the tree nursery. He says *citron* (lemons), but he adds that they are hard to grow. He says people desire *citron* because they are some of the easiest to get money from and that they provide good *umbwage* (shade). He continues as we begin our walk through town, talking about how local peoples go with donkeys to nearby Tiplaz and other villages to sell small amounts of the *citron*.

At this point, we pass an older man on the side of the road. The man, who people refer to as Papi (father), is leaning against a *zaboka* (avocado) tree on one side and a walking stick on the other. He greets me with the traditional *"Bonswa!*" as I pass. Despite the summer heat and being more than 70 years old, Papi follows us with brisk steps. He remains with the group for the 45-minute hike we take to the tree nursery and water source.

While at the nursery, I ask again about the types of trees people want most in the area. Nedal then lists tree species: "*Selman*, *lacina, citron*" and finishes with "for the purpose of shade." I think back to my interview with Odette and others since then. Nedal says he would like to make a "definitive

forest" where no one cuts trees, and notes that people around Rivye Froide cut trees but replant regularly. In other villages I may have been skeptical of this claim, but from my observations of the area and the community structure, I believe Nedal. The schoolteacher then asks if we would like to see Papi's forest. I think to myself that the translation of "forest" is probably incorrect. Yet, the towering trees and dense canopy that we see after a 10-minute walk shows there is no mistake.

Moving past a massive mango tree and entering Papi's forest, I feel as if I have entered an air-conditioned complex. The sunlight dims to the point that I must remove my sunglasses to see the hundreds of trees that the older farmer has planted. It is cool, like the jungles of Peru, and I think about how this experience must be what the whole country was like before deforestation. I also think that this comfort must be why people love trees near their homes and why by far the most prized use of trees in the area is for shade.

Papi eventually speaks up and tells us that he planted this forest because he could not cultivate other things. He adds, "I began planting trees twenty years ago, when I started to get old." Still surprised by the temperature change, I write, "this shade is amazing!" and underline it three times, so that I do not forget my realization of why such a tree use is important to the people of Anse Rouge Area.

The business students begin asking questions, and Papi says that he can get 2000 *goudes* ($50 US, or the equivalent of one month's wages) for one tree. When asked how he finds people to sell them to, he says that people ask him for wood and that he does not have to try to sell them. Sandy asks again about why he planted trees, and Papi replies, "Before Hurricane Jeanne, this land was fertile. After Jeanne, it was all rock, and the soil was gone, so I created this forest." We enjoy twenty minutes of *umbwage* and discussion before making the trek back to the vehicle. As we walk, the business students call Papi's forest his 401k. I think about how research partners also discuss trees as ways of saving for hard times. I think about the many uses of trees as substitutes for spending money in the Western fashion: savings, building materials, and especially for food.

***Manje*- Food**

More than I originally considered, trees provide food to rural Haitians for subsistence, serving as an alternative to crops when necessary. The importance of trees for fruit is shown in the distinction between *pyefwi* (fruit trees) and *pyebwa* (wood trees) in some of the villages visited. Unlike the superficial designation I have seen between these two types of trees in the U.S., Haitians show a more distinct differentiation. For example, when asked questions about *pyebwa*, some research partners would refrain from mentioning any fruit trees until explicitly asked about these species. At which point, they would say something like "of course I want to grow mango trees!" and wonder to themselves why I had not asked them about *pyefwi* if I was interested in that too. Research partners discussed the importance of *pyefwi* for supplemental food in times of poor crop yields, food for babies, food for people with different ailments, and healthy food when compared to "chemical foods" purchased from other countries. One middle-aged woman named Flore spoke passionately about her continued use of trees for food, despite changing trends in food consumption:

John: So what kind of trees or plants do you use in your daily life?

Flore: Pyefwi (fruit trees) like mango and kokoye (coconut)

John: And what kind of uses do you have for these trees?

Flore: Well, I sometimes eat mangos and eat kokoye, and if we are lacking work, I may sell some of them.

John: So do you think you eat more food that you grow or buy more food?

Flore: Well I realize that people right now, they don't really give much importance to the things that they grow on trees and in their garden. They prefer buying stuff like rice

John: And when did you see this change happen?

Flore: It has been a while… a long time. Some people think that pitimil (millet) is bird food. So it's bad to be eating it. For me, it's not a problem, because pitimil is good food, is heavy food. Pitimil is heavy food but rice is light food. People like to eat the rice like three times a day. But even if you

cook a good pitimil meal with beans, people don't like it. Even my kids right now, if I can make rice everyday three times a day it will be good and everything, but if you make pitimil, they going to tell you they don't want it. That's why people have a lot of diseases now, because we eat too much "chemical foods." But back in the day, pitimil was good food to eat.

Flore gave a summary of a few key themes drawn by research partners. She highlighted the changing trends in buying food (as noted in Chapter 3), the decreased health of people because of these changes, and the continued use of trees and home gardens (with things like *pitimil*) for food by herself and some others. She went on to note the reduced connection of many to the land, including through less use of trees for food and medicine. While some research partners have begun purchasing items instead of using natural sources found through various tree species (particularly those people in towns close to Port-Au-Prince like Ti Bwa and Deschapelles), nearly every research partner acknowledged the use of trees in relation to attracting and preserving water.

***Fe Lapli Tonbe*- Bringing the Rain**

There were times in my research when I asked specifically about trees and their uses. At other times, trees arose through conversation of other topics. This dialogue most commonly occurred when discussing changes in temperature, soil cover, and rainfall. After hearing repeatedly "*lapli pa tonbe"* (the rain doesn't fall) and that the amount and timing of rainfall had become unpredictable, I decided to look deeper into this concept. Rather than relying on my outsider knowledge on why these processes occurred, I sought out local knowledge on the subject. In the fertile valleys of Deschapelles, the cool highlands of Ti Bwa, and the cactus-lined hills of Anse Rouge, research partners responded to my inquiry with two primary answers: "*selma Bondye konnen"* (only God knows) or "*paske pa gen bwa"* (because there are no trees). Research partners commonly related trees and water and they gave emphasis to the bringing of water and the preservation of water.

***Pwoteje Sous Dlo*- Preserving Water Sources**

Along with bringing the water to the land, rural Haitians have taught me that trees help conserve water already present. Research partners explained that trees kept the land from getting drier and drier. They likewise highlighted the role of trees to protect structures of water transfer and water use. Rural Haitians seemed to regard trees as protectors of waterways (both manmade and natural). I saw this tree use most clearly in the local taboo against cutting down trees near *sous dlo* (water sources).

Research partners demonstrated taboos on cutting certain trees in all regions and all villages visited. Rather than prohibiting the cutting of certain tree species (which I originally through was the case from the varieties of trees left standing), trees were typically left standing because of where they were instead of what they were. In the highlands of Ti Bwa, mountains contained dense forest cover only where natural springs and headwaters occurred. In these areas, Haitians actively planted trees and refrained from seeing them as potential charcoal sources, even as a last resort. The difficulty of finding water in Ti Bwa may have perpetuated this taboo.

I learned of the water problems in Ti Bwa through the lived experiences of Talia, a teenage mother of four with a persistent smile and light brown skin. A few business students and I stayed in her home for a few nights, where hand gestures and my unimpressive Creole skills at the time served as the only forms of translation. Despite this communication difficulty, we spent the evenings talking around candlelight, exploring each other's cultures, and singing songs in both Creole and English. I would also take this time to learn about life in Ti Bwa in a more relaxed and natural setting. One evening, after our nightly ritual of teaching each other new words, phrases, and dances, I asked the family more about their daily life. When questioned on where she got the water that our group used for bathing, Talia pointed to a 5-gallon bucket and said:

I take this bucket up the hill. I can take a ten-minute walk to a vendor, who will fill it from a pipe for one dollar (one Haitian dollar or about 12 U.S. cents). If I do not have one dollar, I can walk maybe one hour to get water from the source in the mountains.

After hearing this story, our group began bathing much less and comprehending the importance of water much more. This scarcity of water, particularly that of useful quality, was not unique to the mountains of Ti Bwa. In the dried riverbeds of Bonnal, Tiplaz, and Lagon, I observed how important research partners found trees for preserving water. This importance also became particularly apparent while travelling to the water source of a mountain town outside of Lagon.

***Pwoteje Sous Dlo* Observed: Hike to the Source**

Past Lagon, we begin venturing through a 20-yard-wide riverbed covered with large rocks (or small boulders). As we drive, I am stunned by the girth of huge trees dotting the riverbanks when compared to what we have seen so far. I notice a few *mapou*, a tropical tree known elsewhere as *Ceiba* or silk kapok, for the first time since my arrival.

As we drive, I learn about the village from a local guide named Jean. He says that there are 1400 people there and that many of the children go to school fulltime in Gonaives (a city two hours away). The man tells us that in this village they have *kabrit* (goats), chicken, sheep, pig, cows, horses, and donkeys, but *kabrit* far more than anything else. He says there is no fencing and that the animals graze free all of the time. When asked if this is the town's main problem, he says it is water scarcity instead. To explain Jean continues, "we used to have a water catchment in the town, where people could get water, but Hurricane Anna destroyed it in 2007." I think of the term "resilience" and the resilience (or lack of resilience) of the structures in Haiti to natural disasters.

When asked how people now get water, Jean tells us that it is a 35-minute walk to their spring. I ponder if he is exaggerating but later do the walk myself and find it to be quite a lengthy trek on loose rocks. Jean talks about the riverbed that we drive through and says "during the rainy season, this river

gets so full that it can sometimes prevent people from crossing for weeks at a time." I make a note that water seems to be a problem on both extremes.

As we get out and walk towards the spring, we reach the site of a local irrigation canal. At this time, the canal is completely dry. Jean tells me that the rain destroys it each year and community members gather in annual *konbits* to dig it out again. I notice that there are many trees along the canal and not a whole lot elsewhere. I ask about this. Jean tells me that they do not cut them down because the trees work to shade the area and keep the water in the canal. I notice it is cool, remarkably so, when compared to sunlit areas.

We then walk along a single-track path with rocks in it. Writing notes becomes frustratingly hard. I learn that it has not rained since April, for about three months now. Another man starts following us now, an older gentleman named Josef with a hint of charisma and outgoing nature. Josef tells me how they grow *mayi* (corn), *kafe* (coffee), *eshallot* (shallots), and *pitimil* (millet) when the rains come. As we get closer to the source of the canal, I notice that things are beginning to get greener. More people seem to be growing things. I smell smoke and see a site of charcoal production in a small, cleared field.

As we walk to the spring up the riverbed, I notice another massive *mapou* tree with a trunk five feet in diameter. With this opportunity, I ask the Haitians we are walking with about it and why people do not cut it down. Jean tells me that nothing can be done with it, since it is hollow and has light wood. We stop at the first watering hole, and a few inches of stagnant water remains there. Flies swarm around the only source of water, and women are waiting to scoop water out with a small bowl and pour it into empty cooking oil gallons. I think about how many small bowlfuls must be used to fill the bottle and how far they may have travelled.

We climb higher and higher towards what I am told is the source of the water. We pass women slowly pulling water out of another small source, where sandy soil mixes with it. I notice that they must wait to refill the small hole with each of the bowl scoops. After walking for another 20 minutes or so, I

start to see thin streaks of water in the dry riverbed. The streaks start with nothing more than slightly damp earth. As we move upriver, the concentration of water gets larger, but it never grows to more than a 1-foot wide and 2-inch deep stream. The higher we get, the more life I notice in the form of insects, small fish, trees, birds, etc. I ask again to make sure I understand them correctly, "so this pool at the source, it is deep enough to swim in?" The men assure me that we can swim in it, but when my hopes are later crushed, I remember that swim and bathe are the same word in Creole.

When we reach the top, the ground flattens a little. Looking for a large pool to swim in, I totally overlook the source. Water trickles out from the bottom of a moss covered concrete slab, which makes up a 5 foot by 3 foot tall section of the river bank to my left. Below this source, there is a small, very small pool of maybe 5-10 gallons. Laughing to myself and covered in sweat, I proceed to pour water on my head with cupped hands. I remove my shirt, soak it in the cool water (probably about 70 F), and wonder why they even call this place "the cold river". More than the water, I notice the coolness of the shade, and I am relieved for the presence of trees in the area.

I ask about the origin of the spring. Jean explains that an evangelical mission brought the pipe system in 2002, which used to take water directly to the village, even when it was dry season. Then in 2004, Hurricane Jeanne destroyed the pipes. I am reminded of the various, diverse ways that this natural disaster has impacted the people of the region. Josef, the older man, then stands up and talks with wild hand gestures. He speaks emphatically about how there is sometimes no water at the bottom hole we stopped at and that sometimes the people come higher because of all of the animals and the bathing in the river. I ask about the tree at the source, which sits directly above the concrete slab, and Josef tells me it is called a *tabernou.* Jean adds that the roots protect the spring and no one will cut them. He also explains that it is forbidden to cultivate around the spring.

After all questions are answered and everyone is sufficiently cooled, we then walk back down the riverbed. I soak my shirt again and drape it over my shoulders. As we walk, I contemplate the

connection between trees and water. Trees bring rain, trees protect canals, trees protect from too much water-caused erosion, and trees protect the source of springs (which I see later in Ti Bwa and Deschapelles as well). And the cause of water pipe destruction in the village is the same thing people use trees to protect against: hurricanes.

***Pwotejè Kont Siklon/Pwoteje Tè*- Hurricane Protection/ Protecting Soil**

Just as research partners discussed the need to cut down trees because of hurricanes (namely Hurricane Hazel and Hurricane Jeanne) and poor crop yields (from soil erosion and unpredictable weather), they also impressed upon me the importance of trees for protection against these forces. The emphasis on this tree use varied based on location, with those closest to the ocean and in areas of historic hurricane destruction discussing hurricanes more frequently and with more intensity. Residents of Bonnal and Tiplaz (Anse Rouge towns nearest to the coast) were particularly adamant about trees as a method of reducing hurricane vulnerability.

Odette made this point in the first interview of my research, describing how even in the most violent of storms, trees remain to help protect the soil. She discussed how many things in her life were lost from hurricanes like Jeanne but that the trees she did have protected some of her soil. The rest, she said, washed away. Another research partner, a man living near the coast in Bonnal, provided a summary of tree use in relation to water:

> Pyebwa yo se lavi. *The trees keep the source of water and allow the rain to fall. Trees protect against hurricanes. If you don't have trees, you will have more damage. These trees here, they protect my garden.*

Just as this man readily links hurricane protection and soil conservation, participants in the first focus group of my research encouraged me not to draw a distinction between the two categories. In the arid and highly vulnerable Anse Rouge area, they argued that tree use to protect against hurricanes, to keep soil, and to promote crop yields was so connected that they should be one category. Each of the men at

the focus group (for they were all men) found this set of tree uses to be particularly important, and many named it their most important use of trees.

Aside from this agreement, the men tended to disagree on what was next in importance. Some of the younger students argued for planting "definitive forests" that were never to be cut down. One older farmer spoke up and explained that while this mindset seemed good, life was not that simple. Like many other research partners in Ti Bwa, Deschapelles, and Anse Rouge Area, the farmer explained that without financial means, he needed to cut down trees for building materials like boards and poles. The use of trees for building materials varied based on wealth and local style of building. Yet, many research partners relied on this tree use to build their homes and the homes of family members.

***Fe Kay*, *Fe Poto, Fe Planch*- Make Building Materials**

Throughout rural Haiti, one of the most tangible uses of trees can be seen along the side of the road: building materials. The straight trunks of *frenn* trees are commonly splayed in piles, removed of their branches and ready for construction as *poto kay* (house poles). These poles then act at the primary support for houses in the most rural of areas. While a few wealthier families in Ti Bwa and Deschapelles produce homes from concrete, the majority of those living in the more remote Anse Rouge area rely on wood-built homes with *poto kay* support. These poles are then connected with boards, ideally from harder woods like *kajou* and *gayak* but more commonly from *chen* and *frenn*. Research partners also discussed using mango and other *pyefwi*, when no wood trees remain.

Research partners did mention producing boards and poles for profit, but more often they discussed finding trees on their land or on the lands of their relatives and building with them. Rural Haitians of Anse Rouge told stories to illustrate the practice of giving wood to family members or friends in times of need. They did so with the attitude of reciprocal giving of time and resources Smith (2001) discusses with respect to *konbit* work parties. In this system, people work for each other without expecting pay, understanding that should they need assistance in the future, others will help them.

Some studies note that the *konbit* system of reciprocal giving is a thing of the past, as seen in the words of Bannister and Josiah (1993):

> *In the past the 'konbit', or traditional work party, was heavily relied upon as a source of agricultural labor and to reinforce social bonds. The konbit is not used very much now. Farmers feel that paid labor is preferable because of the high cost of food and drink to the sponsor of a konbit, and the relative inefficiency of the labor* (249).

My research supports the idea that the *konbit* system and other methods of reciprocal giving (such as offering building materials) continue to play a large role in the lives of rural Haitians, but only in some regions. Research partners in Deschapelles and Ti Bwa, areas of heavy outsider influence and wage labor, did not often mention such practices.

To Haitians in the more rural Anse Rouge Area, *konbits* and giving of building materials remain important. Research partners of this area explained that once the recipients of wood had planted trees and allowed them to grow, those that originally gave the building materials would have an unspoken safety net. If they were ever to need home repairs or a new home, others would work to assist them and provide building material. This need most often comes from hurricane destruction or the need to sell lumber in order to pay for funeral costs or medical care.

***Sante e Medikaman*- Health and Medicine**

Many of the tree uses from my research were discussed predominantly (but not exclusively) by one gender. Men, who farmed more often than women, often talked about soil preservation. So too did females who lacked husbands and actively worked the land. Men often brought up making poles and boards for houses, but woman did so occasionally. The most gender-influenced topic in my research was the use of trees for promoting health and managing illnesses.

Women would discuss the use of different tree leaves for teas that could cure various ailments and salves to reduce coughing or disinfect wounds. This topic often led to discussion of trees for protection of health in ways that Western culture might put into the category of spiritual. Women also

discussed repeatedly how the use of trees for medical purposes has changed through their lifetime. Some of them talked about preserving this knowledge by passing it on to children or teaching friends. Obania, a woman in her 70s, spoke about her continued use of trees for medicine and spiritual protection, but remembered times when most families relied on trees in these ways:

> *Obania: People cut down trees to make charcoal out of them, but back in the days, those trees used to make a lot of shade, you could sit down under candelon trees. You could also use these candelon trees to tie animals to in the shade. Back then we could use candelon if kids had acne. We would put leaves in water and use them to bathe the kid. Some trees you can make teas out of them. Kalities, you can use them for people who have a cold, or who are coughing. Zanman you can use for someone who has cough.*
>
> *People used to not go the doctor as frequent as today. When people were sick back then, they would go to the land and garden and get trees and make teas for them and cure them. They wouldn't go to the doctor like the way people are going to the doctor right now for anything. And some trees, kalities, they are not here anymore.*
>
> *John: And do you know why it's not around here?*
>
> *Obania: Because of deforestation. Because of drought (lapli pa tonbe). People cut down too many trees and it's not growing anymore, so it's too dry for this kind of trees.*
>
> *John: Too dry for them, okay. And… what kinds of things make people have to cut down trees?*
>
> *Obania: Misery. Poverty.*

This passage demonstrates Obania's knowledge of traditional medicine when compared to the rare mentioning and taciturn comments of tree medicine by men. I most readily noticed the difference in emphasis on medicinal uses of trees during focus groups separated by gender.

***Sante e Medikaman* Observed: Focus Groups**

It is my return trip to Haiti in January 2013, and five women meet with our small research team for a focus group. The team consists of a female intern named Laura, a translator named Ernzo, and myself. We all sit around a wooden table in the open air, which has cooled in the afternoon light, and

discuss the tree uses highlighted through the summer's research. As we talk, we share *bon bon*s (crackers) and bottled drinks, which I am told constitute customary offerings for guests.

After explaining my role as a student of Haiti, I begin the focus group by asking the women about the phrase I had heard so often during the summer of 2012, "So, what does *pyebwa yo se lavi* (trees are life) mean to you?" Unlike the more reticent men from my last focus group, the women open up immediately and play off one another's comments energetically:

- *Well, without trees, you cannot live!*

- *When you don't feel well, go lay down in the shade, and you will feel good.*

- *We find money in trees, breathe them in, and cut branches for cooking.*

Then, Chante', a jocular research partner I interviewed in the summer, speaks up. The others seem to fall quiet as she talks:

- *If there are no trees in the country, then I am already dead. I need trees to help my children live!*

After a discussion of their various uses of trees, which included building houses, shade, food, and hurricane protection, I ask the group if they would mind ranking these uses from most important to least important. Instead, they go on to discuss protecting children only. Seeing how important this tree use appears to them as mothers, I do not press the ranking exercise I had planned. A younger woman in braids and a floral patterned dress begins the discussion, "Well, for our children, medicine is most important."

Over the next twenty minutes, the women teach the research team about various tree species and the ways they use them for promoting health of their children. I learn that *pòm kannèl*, *asowosi*, *citronell*, *cachiman*, and *fwòbazin* all help to treat fevers and that *lagachat* and *fle' chou bwak* treat coughing. Chante' specifies that *bwa chandel* works well against extreme, chronic coughing. As they spout out a wealth of knowledge on traditional medicine, they refer to trees, shrubs, and grasses alike.

To my surprise, they then shift seamlessly into discussion of what outsiders may classify as spiritual or "Voodoo" medicine. A smaller woman, who appears older than the others and wears a light blue dress, notes that some leaves are good for everything, "*Fèy kozin* and *monbin pata*… if you add magic to them, then any spirit you have is gone. You can boil it for tea, use it as perfume, or add fire to it." Chante' adds, "Yes, and some trees are good for preventing *loupgarous*." They continue on the topic *loupgarous* for the remainder of our time together.

Literally translated as "wolf men", locals see *loupgarous* as shape shifting creatures that cause illnesses and other harms against children. The women spend time teaching us about those mechanisms they use to protect their children from such beasts. These include plants like *fey kontra*, *chemin kontra*, *pa janbe*, and *lalwa*. There is even mention of *etwal lambe,* or starfish. Seeing my interest in the topic, they discuss the characteristics of *loupgarous*, laughing as they do so. I am reminded of the other discussions I have had about this creature during my time in Haiti, and how my questions about it are met with both surprise and humor. At times, this creature seems to be a joke among rural Haitians. At others, research partners present this issue in a serious manner. Yet, through all discussion of *loupgarou*, research partners seem not to separate this belief as something pertaining to Voodoo specifically or something than can be compartmentalized into the outsider separation of spirituality and daily life.

Spiritual Protection

In the end, the knowledge I looked forward to learning most (spiritual, mystical, or Voodoo uses of trees) proved the most difficult to obtain. After my first few interviews in the summer of 2012, I became hesitant as to how much spirituality impacted tree use in rural Haiti. No matter how I presented it, I could not get anyone to discuss spiritual uses of trees in a personal manner. Some research partners would hint at spiritual uses but shy away from actually stating them. Others would completely retract at the mention of Voodoo. Most would reply with a simple "of course not, I am Christian."

From my experiences, I feel pretty certain that popular figures like 100% of Haitians practice Voodoo (Guynup 2004) are exaggerations and that at least one Haitian does not actively practice Voodoo. In the times I have encountered this claim, it is usually linked to sensationalism from depictions of Haiti by outsiders. Yet, the opposite end of the spectrum, that most research partners knew nothing of Voodoo practices, also seemed suspicious. Since I had been exposed to much spiritual connection of local peoples with trees during my time in the Central Plateau, I approached questions differently and sought out other ways of presenting my thoughts.

To do so, I kept notes of every hint of spiritual practices I noticed in interviews or observations. These included references to *Bondye* (God), *lwa* (spirits), and *majik* (magic) while discussing trees. I then sought out Voodoo priests in Ti Bwa and Anse Rouge and asked them about certain spiritual practices, supported by my increasing knowledge of the regional culture. The Voodoo priests, who appeared impressed by my level of interest and insider knowledge about Haitian spiritual practices, granted me entry into types of knowledge not commonly shown to outsiders. The first of these conversations, when I felt the barrier of "outsider" begin to crumble appears below:

John: … and are certain trees better than others, for rituals?

Priest: yeah some trees, you can use them for Voodoo stuff.

John: Oh ok... And I've heard of something, when you pour moonshine on a tree, and I just wanted to learn more. Do you know this thing?

(At these words, the Voodoo priest's mouth drops open and I think I may hear a slight gasp. I wonder if I have said too much. Then, as I prepare to retract my statement and switch to a safer topic, his open mouth turns into a smile, and he lets out a laugh from deep in his belly)

Priest: Ha ha! Well, you know a lot!

John: Oui! I am learning! You are teaching me!

Priest: Well the moonshine, that is because there is a spirit. There is a Voodoo spirit inside. For example, that tree (at which point, he points to a stout tree behind the building, with a trunk

> painted green and palm fronds folded into various shapes nailed to branches)… *That tree, if you go and take a leaf, you will die* (I later find out he means if I asked for things from the tree, like a leaf, and did not treat the spirit right, I would die). *It is because it has a spirit. It is a bwa kaka tree. Also, whatever disease someone might have, any kind of disease you have, if you use that tree and make tea out of it, and put moonshine on it* (thus treating the spirit right)*, you will get better… if you want to hide your kids from evil, you can use mapou leaves to hide them, and bad spirits would never see them.*

Not all examples given by the Voodoo priests were attributed to Voodoo spirits in this nature. At other points, their conversation shifted towards what I would consider medicine or general protection of health or family.

With these and other cultural practices in mind, which I had recorded over my first few weeks of research, I was then able to use my newfound local knowledge to ask research partners about specific practices and beliefs. I avoided the loaded word "Voodoo" (which has been discouraged by outsiders visiting Haiti) and even "spiritual" (which I originally thought harmless). By doing so, rural Haitians began readily expressing what outsiders may call "spiritual." To many, however, there seemed to be no separation between what I may call "spiritual" and daily life.

Through weeks of interviews and observations, I concluded that the separations between "human" and "environment" and "spiritual" did not often apply to life in rural Haiti. While outsiders may not be able to fully comprehend these seamless domains, I argue that viewing life in Haiti as a coupled social-ecological (or even social-ecological-spiritual) system allows for better understanding of the many uses of trees in rural Haiti.

CHAPTER 5: CONCLUSIONS

My research focuses on the *Pwoblem Pyebwa* (Tree Problem) in rural Haiti that has decreased forest cover and negatively impacted local peoples who depend on trees in their daily lives. I conducted qualitative, iterative research with Haitian research partners and combined this with ethnographic and natural-science knowledge from outsiders. Through this research process, I was able to identify causes of deforestation that have originated through history. Viewing Haiti as a Coupled Social-Ecological System (as local peoples seem to do) has allowed me to tease out complex processes that foster a continuing cycle of poverty and environmental degradation. I have named this the *Pwoblem Pyebwa* Cycle. I also used knowledge of locals and outsiders to situate this cycle in the historical context through the *Pwoblem Pyebwa* Model. Doing so has revealed systemic causes of deforestation in Haiti in the form of Initiating Factors (factors from the Colonial and New Haitian Republic Eras that initiated and continue to impact the Cycle) and Catalyzing Factors (factors from the Post-Occupation Era that perpetuate and increase the magnitude of this Cycle). Lastly, I worked with Haitian research partners to study different types of trees in rural Haiti and the local uses of such trees. I conducted this research with the mindset that local peoples hold the most knowledge about their uses of trees and should be treated as teachers, with me a student of Haiti.

In order to better understand what information is locally specific and what information pertains to the larger Social-Ecological Systems of Haiti, I conducted research in three rural regions: Deschapelles, Ti Bwa, and Anse Rouge. I focused mainly on the Anse Rouge Area and worked in three villages: Tiplaz, Lagon, and Bonnal. Each region and each village in these regions had its own set of environmental and social characteristics. Most importantly, this setup demonstrated the diversity of specific factors impacting deforestation and tree use across regions and even across villages of the same region. Despite these differences, commonalities seemed to run throughout rural Haiti, and I have set up the *Pwoblem Pyebwa* Model as a model that can be used across regions.

The cycle of poverty and deforestation existed in all studies areas, but what differed was the specifics as to which Initiating Factors and which Catalyzing Factors held the largest importance. This realization leads to my first suggestion for collaborative reforestation efforts in Haiti: instead of making a general plan for projects across regions (or across countries for those organizations working in multiple locations), the locally specific tree uses and factors impacting these tree uses must be given emphasis. I believe that focusing on participatory methods and working "with heads together" can promote more successful reforestation that highlights those factors most important in the lived experiences of rural Haitians.

***Tet Ansanm*: Suggestions for Working with "Heads Together"**

Research partners from Deschapelles, Ti Bwa, and Anse Rouge provided suggestions to alter reforestation efforts and improve the ways in which outsiders and Haitians work *tet ansanm* (the common Creole phrase of collaboration or working together towards the same goal, literally "with heads together"). Above all, local research partners expressed the need to "sit down and speak with people before doing projects." Some expounded that by doing so outsiders will see that projects must address the day-to-day needs of people, not just the long-term. Research partners discussed their love for trees and unfortunate need to cut them down in times of need, as one woman in the mountains of Ti Bwa described:

> *We don't feel like cutting them down, but since we do not have any other financial means we are pushed and forced to cut them down to help and provide food on the table for our kids and families.*

She then discussed that those projects that could help them to provide for their family while waiting for the trees to grow would become the most successful.

One man, visibly and audibly angered with the broken promises and top-down outsider influence taking place in an area close to Port-au-Prince provided elaborate ideas. He did so while claiming that groups who tell donors they focus heavily on participation have brushed his ideas aside.

Instead of one NGO coming in, claiming its territory to work in without the request or consent of locals, and designing projects without local input, he argued that locals should decide what projects are done. And then, *blans* (outsiders) should "have multiple NGOs that people can choose from… so people can choose who is best for the job." The most energetic responses of this man and many other research partners who opened up to me was much simpler: "Keep promises."

From my observations and from my reading of the ethnographic literature, I believe that NGOs and donor agencies should also change donor relations. The extent of donor constriction on NGOs has provoked some locals to bring up metaphors of slavery, but Schuller (2012) says that NGOs are not helpless in this process. Instead, he promotes using multiple, smaller donors so as not to be pressured by the desires of one outside funding sources and to turn down any funding that does not allow for local input. On the donor end, he promotes the funding for partnerships instead of funding for results, which has led to project failures and an emphasis on quantitative results dissociated from local context (Schuller 2012).

Locals also gave more specific suggestions to improve reforestation initiatives. While these ideas may not work for every area, they demonstrate tangible suggestions they may arise. In Anse Rouge, many research partners suggested focusing less on planting and more on the prevention of sapling death from locally identified forces like goats and lack of irrigation water. To do so, they suggested improving fences, building concrete canals in place of mud canals, and encouraging others to tie up animals or keep them in an enclosed area. In Ti Bwa, people suggested using locally identified trees and a mixture of trees instead of stands of the same tree species. Up until now, outsiders or a select few who may not understand what others in the area want have chosen these tree species. Other research partners suggested planting near gathering places, in markets, beside water sources, and around homes.

I add to these suggestions, arguing that NGOs should alter the ways that they present Haitians to donors. Haiti has long been depicted as a helpless and isolated country that can only survive with

outside control. This mindset comes across in project websites, which highlight photos and text depicting the education of local peoples on Western techniques. Instead, the competency of locals to assess their environment should be highlighted, along with the complex social and ecological processes that constrain the actions of Haitians. After all, "People who are dependent on local resources for their livelihood are often able to assess the health of the environment and the integrity of the ecosystems better than any evaluator from the outside" (Berkes 2008:42). My research suggests a fundamental mindset shift among outsiders will be required for reforestation projects to succeed. This shift will require outsiders to acknowledge Haitians as experts of their lifestyle, their ecosystem, and how to improve these both simultaneously.

This shift and an increase in true participation can alter the path of fifty years of unsatisfactory reforestation initiatives. My research may provide a place to start with the *Pwoblem Pyebwa* Model and with awareness about local Haitian knowledge on trees and their uses. Moreover, the methodology of my research and the results obtained by viewing Haitians as research partners and professors of environmental knowledge in Haiti supports the idea that locals and outsiders can work collaboratively to address the *Pwoblem Pyebwa* of Haiti *tet ansanm*, with heads together.

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