

Addressing Deforestation on the Island of Hispaniola

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By

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Abstract

ADDRESSING DEFORESTATION ON THE ISLAND OF HISPANIOLA

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Deforestation disproportionately impacts countries in tropical regions given the dependence on forest-related activities as the predominate source of income. The island of Hispaniola, composed of neighboring nations of Haiti the Dominican Republic, in particular has experienced varying levels of success with forest conservation. However, for the most part the recovery of forested land has progressed at a slow pace, if at all. This study takes a qualitative approach to determining what factors have hindered the optimization of conservation efforts and how they can be improved upon to support reduction of deforestation in the future. Conservation practitioners with experience specific to Hispaniola were interviewed for this study and their responses indicate that barriers to effective conservation fall into four broad categories: social, economic, governance and management. The component that emerged as the missing piece of the puzzle on

the island of Hispaniola is engaging with local communities to ensure the progression of conservation efforts.

Chapter 1: Introduction

There is an abundance of literature addressing the causes and impacts of deforestation, as well as conservation efforts, so this research set out to determine the effectiveness of forest conservation specific to the island of Hispaniola. A conceptual framework was developed based on effectiveness literature to analyze existing conservation efforts. Interviews were conducted with practitioners who have worked on the conservation projects on the island to determine how their responses aligned with the three concepts in the proposed framework: monitoring and evaluation, community engagement, and governance. The resulting responses provided insights on the factors hindering effectiveness of local conservation and resulted in the need to adapt the proposed framework to properly reflect what was actually happening on the ground on in Hispaniola.

Forests are complex ecosystems that house approximately 80% of the world's biodiversity, which is defined by the Convention on Biological Diversity as all of the life forms and their ecological, often interrelated, roles found within an ecosystem (Nelson et al., 2009). More than just trees, forests serve as a renewable natural resource that provide environmental, economic, and social benefits (Costanza et al., 1997; Liebhold, Brockerhoff, & Nuñez, 2017; Lohbeck, Bongers, Martinez-Ramos, & Poorter, 2016). 1.6 billion people depend to varying

degrees on forests for their livelihoods, with 350 million living in or near dense forests relying on them (Belcher, 2005). The forest sector directly employs approximately 10 million people, with indirect employment, including forest byproduct related commerce streams, ranging from 30 to 50 million people in developing countries (Agrawal et al., 2013).

Despite their potential value as a source of resilience for communities through food security, income generation, and shelter, it is estimated that about 13 million hectares of the world's forests are lost each year due to deforestation (Bonan, 2008; FAO, 2015). The current chapter will discuss the overall importance of forests, the status of deforestation in general, and will then address tropical deforestation in particular.

1.1.1 Importance of Forests

Forests are expansive, awe-inspiring natural resources that have existed for millennia, however, the international community has only recognized the fundamental threats to their existence within the last few decades (Bowles, Rice, Mittermeier, & Fonseca, 1998). Forests play a significant role in the economy through the production of lumber, composites (also known as engineered wood), paper, and chemical products (such as acetic acid, hydrogen, and menthol, among others), and tourism/recreation while also providing a vital contribution to humans – a connection to nature (Costanza et al., 1997; Shmulsky & Jones, 2011). According to the Food and Agriculture Organization of the United Nations (FAO), the forest sector contributes about \$600 billion annually to global gross domestic product (GDP). The livelihoods of millions of individuals in the tropics

are dependent either directly or indirectly on forests, making it imperative to address adverse land cover changes in this geographic region (Lamb, Erskine, & Parrotta, 2005). For example, deforestation associated topsoil loss reduces rice output by 1.5 million tons per year – that is enough to feed up to 15 million people (C. J. Bradshaw, Sodhi, & Brook, 2009).

The earth's natural systems and their associated feedback loops are dependent on forests for regulation of water and air quality, natural disaster risks, and climate (Brandon, 2014). Research has shown that forest cover has an impact on flood risks, namely that trees reduce the force of rainwater by taking the brunt of the impact of floods, which thereby reduces soil erosion, while their roots serve as soil binding agents to prevent runoff (C. J. A. Bradshaw, Sodhi, Peh, & Brook, 2007; C. J. Bradshaw et al., 2009; Cardinale et al., 2012). Forests can also absorb carbon dioxide and thus can moderate anthropogenic emissions, that in turn helps to moderate climate change from greenhouse gases (Sun et al., 2015).

50-90% of all terrestrial species call forests their home and due to deforestation they are experiencing significant habitat loss (Visseren-Hamakers & Glasbergen, 2007). Of the 35 global areas currently identified as biodiversity hotspots, a significant number are tropical forest ecosystems and are home to species with restricted distributional ranges that require particular bioclimatic conditions to survive (Lindenmayer & Hunter, 2010; Marchese, 2015).

1.1.2 Deforestation

Since 1990, approximately 130 million hectares of forest have been lost, however, the overall rate of deforestation has decreased thanks to improvement in land management, international conservation agreements, and classification of lands as protected areas (Barbier & Rauscher, n.d.; Nolte, Agrawal, Silvius, & Soares-Filho, 2013). Agricultural expansion, encompassing activities such forest conversion for crop cultivation, ranching, and the creation of land for community colonization, is largely noted as the most prevalent direct driver of deforestation (Benhin, 2006). As developing countries progress through early phases of economic development, their primary source of financial growth has often stemmed from agricultural production (Grossman & Krueger, 1995; Shafik, 1994; Walker, n.d.). As countries become developed, they have access to technological advancements, improved social resources (such as education and healthcare), and employment opportunities outside of labor intensive industries. Accompanying the improved social and economic standing of a country, there is a decline in deforestation, and remaining forests can experience regeneration (Angelsen & Kaimowitz, 1999; Archibugi & Michie, 1997; Vanclay, 2005). Despite the traction forest conservation has received through international platforms and knowledge of the main factors causing deforestation, there is limited quantitative and qualitative data related to the impact of direct and indirect drivers on effectiveness of projects (Hosonuma et al., 2012; Kissinger, Herold, & De Sy, n.d.).

Tropical forests, which are predominantly located in developing countries with low gross domestic product (GDP) statistics, have experienced the greatest total forest loss. These areas alone account for 32% of global forest loss according to a 12-year study conducted from 2000 – 2012 that characterized forest extent, gain, and loss (Hansen et al., 2013). The rate of deforestation is alarming given the role that forest ecosystems play in the global biogeophysical cycles and their contribution to economic and social stability for some of the most impoverished communities (Lawrence & Vandecar, 2015).

1.1.3 Tropical Deforestation

As previously mentioned, nations experience a pattern of increased deforestation during early stages of economic development, which tapers off as agricultural pressures decline and the economy starts to rely upon other sectors (Drummond & Loveland, 2010). The Environmental Kuznets curve describes this as an inverse relationship between environmental quality and income per capita with GDP and environmental degradation, which in this case is deforestation, both of which increase together during a nation's initial development (Sloan, Goosem, & Laurance, 2016). During the developmental stages, once a country-specific income threshold has been met, degradation decreases whilst GDP continues to climb (Leblois, Damette, & Wolfersberger, 2017). Tropical regions and their populations also often face geopolitical and socioeconomic issues, such as poverty, low education levels, and limited land rights, among other challenges that serve as a perfect storm of factors contributing to high levels of deforestation (DeFries & Rosenzweig, 2010).

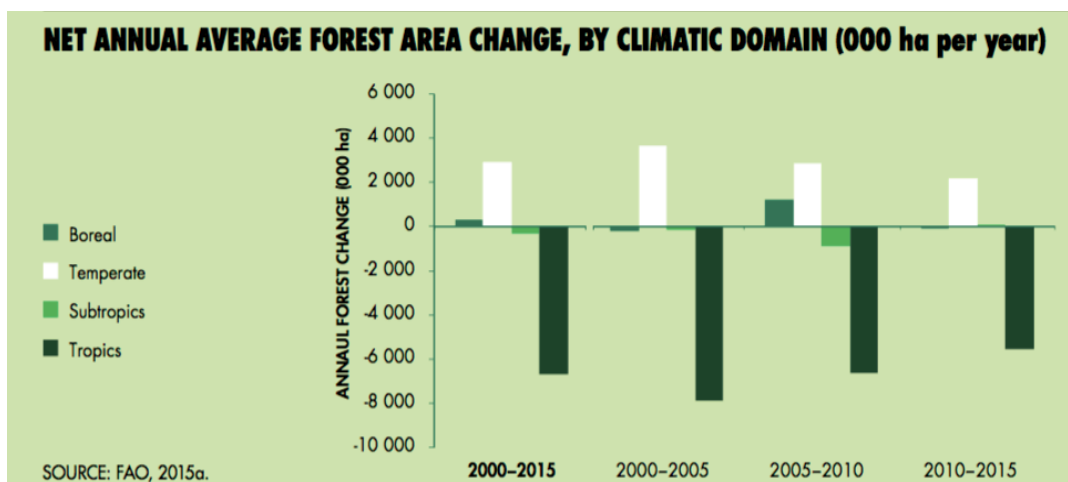


Figure 1.1 Net annual average forest area change by climatic domain (Forest and Agriculture Organization of the United Nations, 2016).

Figure 1.1 shows tropical regions that have experienced net decline in forest area for each five-year period that the report took into account.

Deforestation is prevalent in the tropics because forests are not only a source of income, but also serve as a source of food, medical remedies, natural products, construction materials, and ultimately contribute to the overall stability of local communities (Angelsen & Kaimowitz, 1999; Laurance, 1999).

Traditional farmers in the tropics combine their historical, culture-based agricultural practices, with cues from the environment, when tending to their farmland (Perfecto & Vandermeer, 2008). These orally passed down agricultural

traditions have evolved over time and typically incorporate locally effective methods to increase crop yield. Unfortunately, forests are predominantly seen as an “input” in agricultural production, a factor that is required to increase crop yield (Benhin, 2006). The clearing of forests, which may have led to once fruitful soils in the past (e.g. through subsistence “slash and burn” agricultural practices, which return some nutrients to the soil via ash, followed by a recovery period for the forest), now contributes to further deterioration of soil quality, as clearing typically leads to intensive cultivation with no recovery period, resulting in lower crop yields over time (Eric F. Lambin, Helmut J. Geist, & Lepers, 2003; Parrotta, Turnbull, & Jones, 1997).

Deforestation intensity, as well as conservation plans aimed to reduce forest clearing, can vary between countries in the tropics. A prime example of disparities can be observed on the island of Hispaniola composed of the neighboring countries of Haiti and the Dominican Republic. Despite historically similar rates of deforestation resulting in drastic decreases to forest cover, which was once 75% coverage for the Dominican Republic and 85% for Haiti, conservation efforts in the neighboring countries have had quite different results (Jaramillo & Sancak, 2009; Templer, Groffman, Flecker, & Power, 2005); these will be discussed in Chapter 5.

The success of conservation efforts is not solely based on the understanding of ecological conditions, it requires taking a holistic view of the underlying drivers of conservation issues, e.g. a mix of social, economic, geographic, and political considerations (Fischer & Levy, 2011; Frankema & Masé, 2014; Jaramillo &

Sancak, 2009; Martin, Maris, & Simberloff, 2016). By definition, conservation traditionally involves the preservation, protection, or restoration of the natural ecosystem (Dellasala et al., 2012). Successful interventions should result in an improved ecosystem, which in this case would be a state in which deforestation does not continue given the forest conservation efforts in place. Despite well-intended conservation efforts in the tropics, deforestation continues to threaten tropical ecosystems, economies, and impoverished communities, especially on the island of Hispaniola. There is an increased need for research that looks into why existing forest conservation efforts are not as effective as they should be. This study will delve into the contributing non-ecological factors that are potentially exacerbating the problem of deforestation in Hispaniola.

1.1.4 Problem Statement

While previous research related to the Dominican Republic exists and has looked into its efforts to restore forests, for example looking into perceptions of villagers and their impacts on conservation, it is limited as is research related to the Haitian side of the border (Brothers, 1997b). As such, there is limited information on underlying factors that have contributed to deforestation on the island as a whole, although there are some details on why efforts have been deemed more successful on the Dominican side of the island (Frankema & Masé, 2014; Hosonuma et al., 2012). The aim of this study was to fill this information gap by developing a framework to analyze past forest conservation efforts and the extent of their effectiveness. The successes and failures identified may help to serve as a case study for other tropical countries.

Specifically, the research questions for this study are:

1. What factors have hindered the effectiveness of forest conservation on the island of Hispaniola according to conservation practitioners?
2. To what extent do conservation professionals evaluate efforts on Hispaniola as effective?

Chapter 3: Conceptual Framework

As mentioned in the introduction, this study utilized a framework developed based on effectiveness literature to aid in the analysis of conservation on the island of Hispaniola. In order to properly evaluate past, existing, and future forest conservation efforts, it's important to understand how effectiveness is defined and what components positively impact it. There were three predominant concepts that emerged from review of literature as especially relevant when addressing deforestation: monitoring and evaluation, community engagement, and governance. Effectiveness literature was chosen as the foundation of this research because the research questions aimed to determine how forest conservation can improve; To identify areas of improvement, it is first necessary to understand what has historically contributed to reduction in rates of deforestation and how it was achieved.

Conservation incorporates a variety of fields such as forestry, ecology, geology, anthropology, sociology and hydrology, which have all contributed to the foundational knowledge that is leveraged by conservation practitioners today (Hays, 1999). Conservation at its most basic level can be defined as the

preservation of the natural ecosystem, which, as mentioned in the introduction, can include biodiversity, water and air quality, but in the context of this research is forested land. There has been increasing societal and political interest in the improvement of protecting key areas of biodiversity to reduce habitat loss, prevent decline of threatened species, and maintain ecosystem services (Asaad, Lundquist, Erdmann, & Costello, 2016).

The following sections will start with defining effectiveness and then dive into each contributing concept and its underlying aspects. The chapter will culminate with the proposed framework, as well as discussion regarding its adaptation based on interview responses.

3.1 Effectiveness in Conservation

Effectiveness in forest conservation is broadly defined as the implementation of interventions that successfully lead to a decrease in harmful conversion of forested land and increase forest rehabilitation (Garnett, Sayer, & Toit, 2007). Design and planning, measurement and evaluation, and adaptive management, are all components that must be addressed in working towards specific goals (Salafsky, Margoluis, Redford, & Robinson, 2002; Stem, Margoluis, Salafsky, & Brown, 2005). Conservation practitioners tend to focus on scientific and technological considerations, but rarely define, measure, and communicate successes, hence, forest conservation as a whole needs more systematic evaluation of interventions and associated impacts (Ehrenfeld, 2000; Saterson et al., 2004). In the establishment of conservation goals, the impact of community engagement and governance arrangements are also not taken into consideration

despite indication in effectiveness literature that each contributes greatly to success, especially in tropical regions.

The ecological value of tropical forests is clear. However, equally important, and seemingly less well addressed in project mechanics, such as design, methods and implementation, is societal value. Populations in the tropical latitudes are often composed of impoverished communities that depend heavily on agricultural production and forests. Forest ecosystems are at the center of a complex and interwoven web because of their wide-ranging impacts on local economies, communities and cultures, and of course, biodiversity and ecosystem services (Brandon, 2014; Mohebalian & Aguilar, 2016; Salafsky et al., 2002).

Despite significant investments in conservation efforts across decades, the employment of thousands of trained professionals in a myriad of projects, conservation progress has been slow. Arguably because the focus has largely been on conservation biology as opposed to the integration of the social, economic, and political issues that also contribute to conservation issues (Salafsky et al., 2002). Resources also remain limited for conservation, both in terms of funding and properly trained human capital, so the burden is on organizations, institutes and individuals leading projects to ensure that they are using funds as efficiently as possible (Kapos et al., 2008). One of the reasons contributing to slow progress is the conservation community's inability to measure progress or success (i.e. effectiveness) of their work because their reporting processes are grounded in inputs, like time and money spent, instead of addressing outputs, like quantitative data validating project goals were

achieved, what interventions were successful, and what changes should be made (Black, Groombridge, & Jones, 2011; Knight et al., 2008; Parsons, MacPherson, & Villagomez, 2017). Equally important is the assumption made by many scientists that providing information through research will lead to progress, however, after two decades of research this approach has proven to be ineffective (Parsons et al., 2017). While measuring effectiveness of conservation projects addresses the ecological component, it largely leaves out the social, economic, and political components furthering hampering progress (Higgs, 2005; Parsons et al., 2017).

The sections to follow will detail each of the key components of the proposed conceptual framework that will be used to analyze the effectiveness of forest conservation on the island of Hispaniola.

3.2 Conceptual Framework

Conservation as an empirical focus has been in practice for centuries, however, conservation research, e.g. determining the most effective pathways to preserve natural resources, has emerged recently. Actors, conservation practitioners associated with academia, non-governmental organizations (NGOs), and international aid organizations, have made great progress, but are still learning how to address challenges, like the unintended consequences of interventions and continued loss of biodiversity despite establishment of protected areas (Geldmann et al., 2015; Larrosa, Carrasco, & Milner-Gulland, 2016). A part of the problem is that conservation projects are addressing complex issues that require integrating social, economic, and cultural factors, which must also be

considered in the development of a solution. It is difficult to establish well thoughtout conservation goals and targets without addressing each of these components. Additionally, information management is not carried out at the level necessary to enable the tracking of variables and past projects; this ultimately hinders current project managers from learning what mistakes not to make (Kapos et al., 2008). Most evaluations of conservation projects tend to be anecdotal versus empirical that would point to potential shortcomings in data collection abilities, which is another factor that serves as a road block to effectiveness (Saterson et al., 2004). Each of these issues can be described as problems with project mechanics, e.g., proper planning, establishing project goals, and most importantly, monitoring and evaluation, which has a significant impact on the effectiveness of a project.

3.3 Monitoring and Evaluation

Monitoring and evaluation has been recognized by actors as an essential component of effectiveness as it serves as an early detection system that can indicate issues with project frameworks and can help to identify what conditions lead to success (Stem et al., 2005). Development of proper monitoring and evaluation protocol is a result of strong planning. The goals of conservation projects are seemingly straightforward (i.e. protecting biodiversity), however, they vary based on landscapes, geography, and the aim of implementers. How then, do evaluators standardize monitoring and evaluation? Literature suggests that evaluation of projects should focus on a fundamental question – what would happen if there was no intervention (Ferraro & Pattanayak, 2006). In order for

proper monitoring and evaluation framework to be implemented, the project's design must be developed in accordance with intended project goals, threats, and solutions.

3.3.1 Project Design and Reporting

The establishment of a conservation target is the most important step in the development of project design. In establishing a target, it is important to describe its current state, so that a baseline is developed against which results can be measured, and to also identify direct threats and other factors negatively impacting the target (Salafsky et al., 2002). In Hispaniola some direct threats include logging, agricultural expansion, and charcoal production; other factors include weak governance structures and poor management. Identifying threats also helps to identify who, or what, is behind them, so that proposed solutions involve appropriate tools and strategies to address the issue at hand. All of these steps sound relatively simple, however, are difficult when scientific, social, economic, and governance aspects are combined.

If a conservation intervention is successful, then the state of the overall ecosystem in question should improve (Parsons et al., 2017). This can once more be tied back to project design – are the interventions being applied addressing the symptom or the causes of deforestation? What indicators are tied to interventions? How are interventions and impact indicators being monitored? While conservation projects are predominantly implemented by governments, NGOs, and private companies, they are often managed by scientists, or individuals that have been provided the technical and scientific background

necessary to oversee data collection and, thus, monitoring and evaluation is based on measures that are easy to measure scientifically, such as the amount of forest cover measured from satellite images (Parsons et al., 2017). In the case of tropical deforestation, it is more common to address deforestation, the symptom, as opposed to low levels of education, lack of economic resources, or social disconnect from impact on the environment, a few of the many the underlying causes of deforestation (Geist & Lambin, 2002).

3.3.2 Evidence-based Decision Making

Evidence-based decision making is supplementary to the project design phase in that it informs methodology to achieve project goals through a systematic review of associated literature to identify and evaluate methods that have worked in the past (Pullin & Knight, 2003). Adaptive management employs an evidence-based approach where monitoring of progress comes into play. Instead of just implementing different actions to address the issue at hand, practitioners run through an entire management cycle including establishing a conservation goal, identifying threats, strategies to address threats, a monitoring plan that identifies the assumed results of strategies and what data is necessary to test these assumptions (Garnett et al., 2007). Once strategies are implemented, data is collected and analyzed, and the results are communicated allowing for project teams to learn from their successes and failures. The adaptive management pathway provides flexibility to monitor interventions, giving practitioners the ability to discover what is not working, and provides the opportunity to modify interventions to ones that are hopefully more successful. However, impact

assessments, which either serve as a predictor of environmental consequences or serve as a cumulative evaluation, are still commonplace within conservation (Cook, Nichols, Webb, Fuller, & Richards, 2017; Stem et al., 2005).

3.3.3 Capacity Building

Capacity building, the process during which local communities are provided the background knowledge and technical training associated with monitoring of indicators, has been on the rise as an effective method to achieve conservation goals and reduce local pushback against restriction on resources (Rodríguez, Rodríguez-Clark, Oliveira-Miranda, Good, & Grajal, 2006; Berkes, 2007). Local participation in project development and implementation has become increasingly relevant in conservation given the advantages like the ability to overcome the historical strain between communities and formal resource management structures (Reed, Van Vianen, Deakin, Barlow, & Sunderland, 2016; Armitage, 2005). Given the need for additional resources to properly monitor and evaluate project progress and to ensure the longevity of conservation after projects have come to a close, there is an opportunity for local communities to step in.

3.4 Community Engagement

Tropical forests are a resource that provide benefits ranging from food to natural remedies to cultural value for many communities (Lawrence & Vandecar, 2015). They are not just vital for the local communities they support, or for regional ecosystems, but also for the world. Local communities have a

significant role to play in the management of natural resources. Traditional agroecosystems have evolved over time through oral guidance passed down from generation to generation and have helped small farmers face limiting conditions (Gliessman, 1992). In order for conservation to be successful, there has to be a greater push by researchers to involve local communities in planning and implementation given the key knowledge they hold.

3.4.1 Local Knowledge and Perception

Top-down decisions made for communities, as opposed to in collaboration with community members and local organizations hinder progress and effectiveness. Local communities reject the legitimacy of any plan put forth that they have not actively participated in creating, or if they are unaware of how they will be effected (Petursson, Vedeld, & Kaboggoza, 2011). Addressing local perceptions and attitudes and openly communicating to encourage participation allows establishment of trust, which is necessary when practitioners are ultimately asking communities to change their lifestyles to conserve natural resources (Sterling et al., 2017).

Approximately 15% of forests fall under “community forest management regimes” wherein communities lead conservation efforts (Arts & de Koning, 2017). Local communities have a vested interest in conserving natural resources, because they are dependent upon them. Giving these individuals the power to contribute not only provides a sense of ownership and allows for dialogue with project teams, but it is also more likely that conservation efforts will continue after the project has ended.

Traditional public policies in developing countries, such as the creation of protected areas, or the adoption of environmental regulations, have had little stakeholder involvement in their formulation, and have often remained largely unsupported socially and politically. Thus, local communities tend not to comply with policies given their income is based on resources that these policies restrict and these policies are imposed upon communities (“top down” management), rather than being developed from the “bottom up” (Mohebalian & Aguilar, 2016).

3.4.2 Participatory Action

Researchers have found that local stakeholders are more likely to willingly participate in conservation projects that provide non-financial benefits, such as a sense of ownership and stability for their family (Sterling et al., 2017). Engaging with communities by taking their local knowledge into consideration during the development of project goals and solutions to threats and creating an open dialogue to address historical community issues that have led to unsuccessful efforts have helped achieve greater success than those that have proceeded without these actions. A community’s interest stems from wanting to conserve resources for future generations and to preserve a public good. This supports literature that states that factors that contribute to deforestation do not necessarily result in increased deforestation rates because communities have working rules for managing forested areas (Porter-Bolland et al., 2012).

Societal values are dynamic and have a significant impact on effectiveness of conservation efforts (Lindenmayer & Hunter, 2010). Implementation of

education programs, which can also be used for capacity building, contribute to helping local views of conservation evolve past the individual level and allow stakeholders to better understand how their behaviors impact their environment and their community (Brothers, 1997a; Dolisca, McDaniel, Shannon, & Jolly, 2009a). Minimizing the sidelining of under-represented local populations in decision-making would result in more effective decisions that integrate local social and cultural components, and increase the probability of success. There is also the co-benefit of economic welfare for local stakeholders as a result of active participation in resource management activities (Vodouhê, Coulibaly, Adégbidi, & Sinsin, 2010). It should be noted that this research does not argue that community engagement in conservation matters is without fault, as there is literature that argues it is oversold. However, in the case of Hispaniola where local communities are largely shut out of conversations regarding the management of land that they survive on, engaging the community is essential.

3.4.3 Economic Gains

Economic instability of local communities due to limited alternative options for earned income contributes considerably to reliance on unsustainable deforestation activities, particularly in tropical regions in developing countries. Educating and engaging local communities helps get them on board with conservation projects, but helping to identify parallel pathways to economic gains at the individual level where incomes rise thanks to new employment opportunities, is also essential.

3.5 Governance

Good governance is essential to achieving successful, sustainable outcomes in conservation including the preservation of natural resources, economic growth, contribution to environmental services and equitable distribution of resources (World Bank, 2008). Challenges to governance have to do with decision-making powers and how they impact stakeholders (Mansourian, 2017). Components of governance can be broken down into:

- (1) Stakeholders: groups and individual community members;
- (2) Decision-making actors: the group of people that come together to shape decisions and make decisions?
- (3) Tools: the way in which decisions are implemented and can include rules, regulations, implementing institutions, and policies (Mansourian, 2017).

Governance of forest conservation in the past used to be “top-down” where national governments would dictate regulations without consulting with stakeholders, but since the 1980s it has begun to shift towards a bottom-up approach with an emphasis on collaboration with local communities and organizations (Macura, Secco, & Pullin, 2015). This shift indicates an increase in acceptance that conservation efforts and community engagement are intertwined.

Forest governance builds on the previously presented definition in that it includes “ all formal and informal, public and private regulatory structures, e.g.

institutions consisting of rules, norms, principles, decision procedures, concerning forests, their utilization and their conservation interactions between public and private actors; and the effects of actors on forests,” (Giessen & Buttoud, 2014). Forest governance faces the additional challenge of enforcement and this is especially true for developing countries located in the tropics, e.g. Haiti and the Dominican Republic (Nasi & Frost, 2009).

3.5.1 Alternative Management Schemes

There has been an emergence of decentralization of control over management of natural resources in which the devolution of traditional governance structures has resulted in new roles for the state, community, and actor networks (Krott et al., 2014). In developing countries, specifically Haiti and the Dominican Republic, governance has fallen to the government because of the after-effects of years of dictator-lead regimes that wanted control of natural resources (Dietz, Ostrom, & Stern, 2003). Many protected areas in the two countries that have been established by the governments of their past dictators remain unregulated and are defined as “paper parks” (Eger, 2016). Paper parks can be identified as those which may have no ecological reason to be a designated as a protected area, no staff are allocated to work there, or are lacking a management plan (Eger, 2016). There are relatively few exceptions and those that exist, like the Ebano Verde reserve in the Dominican Republic, have issues that have persisted and significantly impacted surrounding communities, as well as conservation efforts. The Ebano Verde reserve is unusually well defined, well financed, and managed by the state-funded NGO, Fundacio Progressio (FP) and was created in

collaboration with the government through top-down, unilateral decision making (Holmes, 2014). Lack of engagement with local communities that were restricted from using land for commercial agriculture has continued over the years as the FP expanded its territorial control to surrounding private farmland without legal rights to do so and without consent from owners. The unilateral management style, which is common in Haiti and the Dominican Republic, ultimately resulted in villagers knowingly breaking regulations to illegally harvest wood or crops.

3.5.2 Social Context

The developmental stage of governance institutions should involve considerations for the human rights and equity of the impacted local communities (Porter-Bolland et al., 2012). In the previously described case of the unilaterally developed reserve, Ebano Verde, the managing authority had initially recognized the needs of villagers and promised support in the form of agricultural assistance, housing repairs, community projects, and compensation (Holmes, 2014). However, the help never came and further contributed to the illegal harvesting of forested land. This situation, and many other similar occurrences, could be avoided through the inclusion of input from villagers and by making appropriate accommodations within governance structures for local needs. Instead, increasingly exclusionary regulations resulted in village resistance in the form of harmful actions like starting intentional forest fires and physical altercations with reserve staff.

3.5.3 Enforcement

Lack of enforcement in both Haiti and the Dominican Republic continues to negatively impact forest conservation. Forests with high levels of enforcement and those where the community has taken collective action have been shown to be more likely to regenerate, e.g. for forest conservation to be successful (Chhatre & Agrawal, 2008).

3.6 Proposed Conceptual Framework

The previous sections have detailed each of the concepts and associated underlying aspects that contribute to effectiveness and are represented in the framework depicted in Figure 1.2. As previously mentioned, each of these concepts – monitoring and evaluation, community engagement, and governance – were identified through effectiveness literature as necessary components to successful forest conservation. This conceptual framework will be used to analyze the effectiveness of conservation on the island of Hispaniola through interviews with practitioners.

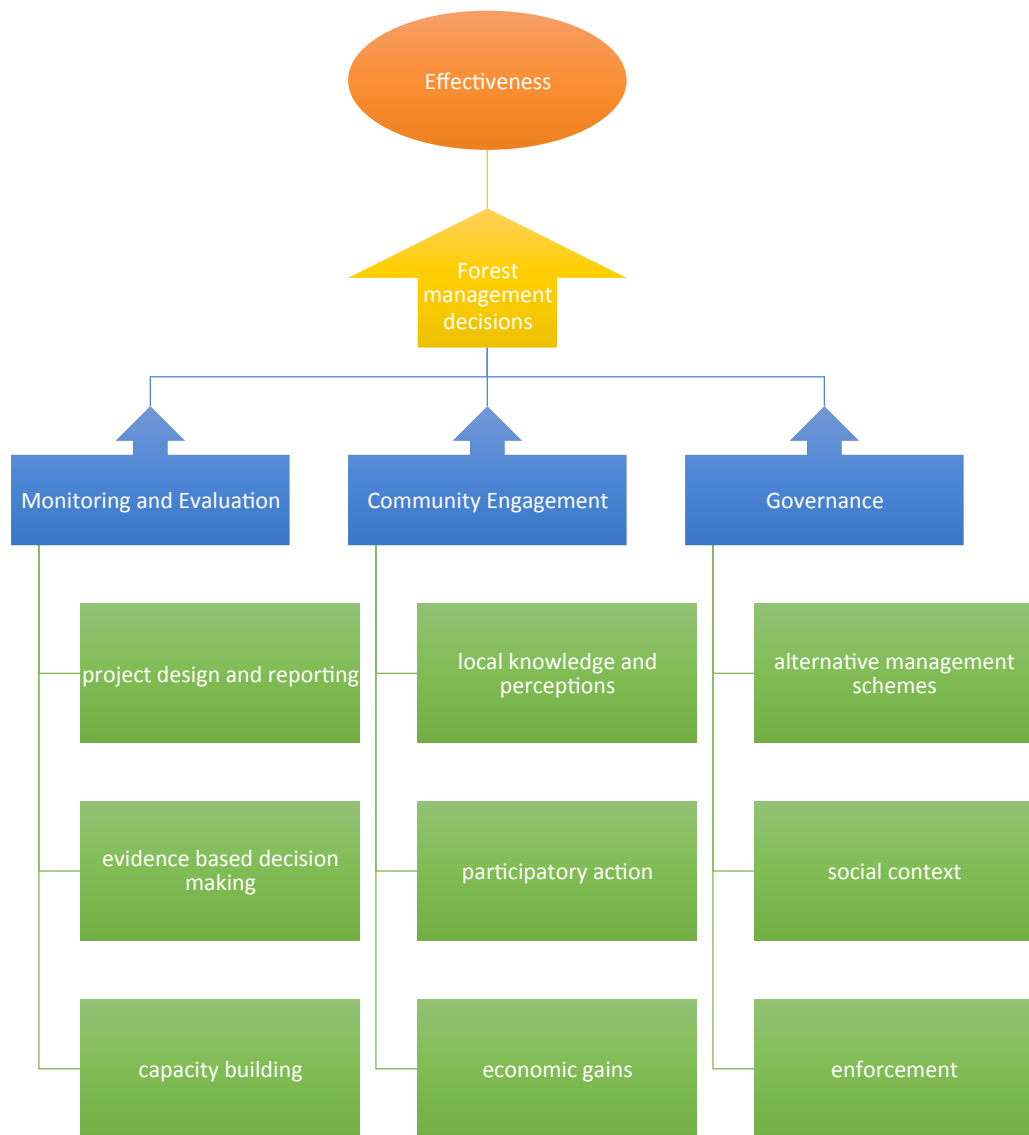


Figure 1.2. *Conceptual framework*

Figure 1.2 is the proposed conceptual framework developed based on literature that will be used to analyze the effectiveness of conservation efforts for this research.

Chapter 4: Hispaniola

This chapter will provide an overview of Haiti and the Dominican Republic's history, economy, and politics to provide contextual background on the conservation issues in both countries.

Despite facing similar conservation issues, efforts to preserve natural resources in the tropics vary in their success rates. There is no "one size fits all" approach in terms of conservation, however, when taking into account similar topographies, climates, and social contexts, the option to customize scalable solutions should exist. The island of Hispaniola, comprised of the neighboring nations of Haiti and the Dominican Republic, is an example of conservation programs with varying levels of success (Alscher, 2011; Frankema & Masé, 2014).

Conservation efforts in the Dominican Republic can be contributed to the role that local conservation elites have played in historically prioritizing sustainability despite the fact that these elites also took advantage of natural resources for personal gain (Holmes, 2010). These individuals come from well-connected families, with connections to the government, or to companies with the potential to make a substantial impact on the country. Efforts are being made to highlight the importance of conservation in both countries, however,

the Haitian side has seen limited progress (Fischer & Levy, 2011; Schelhas, Sherman, Fahey, & Lassoie, 2002). This chapter will provide an overview of Haiti and the Dominican Republic's history, economy, politics, and conservation.

4.1 History

The Dominican Republic and Haiti both experienced colonial rule early on in their histories; the Dominican Republic was colonized by several countries including Spain, France, Great Britain, the United States, and even by its neighbor Haiti; Haiti was colonized by France (Kearney, 1986). Hispaniola was claimed by Christopher Columbus in 1492 and became the launching base for the Spanish conquest of the Caribbean, which led to the eventual disintegration of Hispaniola's indigenous population of nearly 500,000 (Redmond 2016). During the 1520s sugarcane boom, slaves from Africa had to be imported from Africa to work the plantations in Hispaniola because of the lack of natives. After the realization that importing labor was too costly, the Spanish redirected their attention to other Latin American countries, leaving Hispaniola's economy to crumble (Redmond 2016).

The 17th century saw the colonization of the western portion of Hispaniola by France and was named Saint Dominique. The French made significant investments in labor and the sugarcane industry, which resulted in Saint-Dominique becoming the wealthiest colony in the new world (Ferrer, 2012). The massive slave rebellion of 1791 resulted in Saint Dominique's freedom from France and was renamed Haiti by the remaining population (Tippenhauer, 2010). Haiti was not recognized as a sovereign state until the 1860s by the U.S.

government, which drastically reduced its opportunities to revitalize its agrarian export sector, and was only recognized by France after it paid \$150 million francs for war indemnities (Tippenhauer, 2010). The cost of freedom was an additional pitfall that left Haiti indebted for decades.

The source of tensions between the Dominican Republic and Haiti is historically rooted in the 24 year long occupation of the eastern end of the island by Haiti after its liberation from France (Turits, 2002). Haitians attempted to invade the eastern part of Hispaniola, then known as Santo Domingo, several times before successfully taking control. This domination is critical to understanding how and why the Dominican Republic established a stronger political and economic foundation. Securing foreign military support to ensure that Haitian occupation would not happen again and the Dominican Republic's dependence on support from Spain, Britain, France and U.S. lasted until the 1930s (Holmes, 2010). Foreign investment allowed the Dominican Republic to develop a competitive edge over Haiti in the sugar industry facilitated by financial assistance by the U.S. and guidance from Cuban sugar planters who fled the civil war in their homeland (Lockner, 2013). As the Dominican Republic's economic landscape strengthened, Haiti lagged far behind due to lack of expertise and resources to leverage the export of common cash crops, which led to the divergence of the two economies.

Both countries also experienced significant political instability with Haiti having 22 presidents between 1843 and 1915 and the Dominican Republic experiencing 50 changes of government between 1844 and 1930. However, the

Dominican Republic began to recover when Rafael Trujillo who played a significant role in the development of conservation initiatives to preserve natural resources took power in 1930 (Cruz, 2012). Trujillo is credited with modernizing Dominican Republic's economy, however, his improvements are tarnished by the negativity of his dictatorship, which resulted in the killings of political opponents, and the creation of national monopolies over products and services that benefited his family and trusted friends (Cruz, 2012). The Trujillo regime in the Dominican Republic (1930–1961) forcibly demarcated the national border with a brutal massacre of Haitians in 1937. Building on Dominican antipathy toward Haiti, Trujillo cultivated a nationalist ideology appealing to Hispanic and Catholic values furthering the divide between the two countries (Stoyan, Niedzwiecki, Morgan, Hartlyn, & Espinal, 2016). After Trujillo's death, Joaquín Antonio Balaguer became came into power and enacted conservation legislation which was more about control over resources than actual protection of the environment, which is largely where the existence of paper parks stems from (Cruz 2012; Frankema and Masé 2014). Balaguer also had distinctly anti-Haitian views; these influenced the majority of his policies and beliefs, including those related to the environment. Dominican society as a whole has been anti-Haitian resulting from their tumultuous history, and has led to the “othering” of Haitians as African, black, poor and uncivilized (Lindskog 1998; Cruz 2012). During the same time period, Haiti was experiencing its own dictatorship under the rule of Francois “ Papa Doc” Duvalier who ruled the country until his death in 1971 and was succeeded by his son, Jean-Claude “Baby

Doc” Duvalier, who ruled until his exile in 1986 (Stoyan et al., 2016). Since 1986, Haiti has been marked by considerable social and political instability and international intervention. A massacre of voters by security forces suspended the 1987 elections. Fraud and low turnout have also tainted election outcomes, and political parties have been weak and remain untrusted by Haitians (Stoyan et al., 2016). The political issues faced by both Haiti and the Dominican Republic have impacted their respective economies and their divergent trajectories significantly.

4.2 Economy

While agriculture has been the predominant source of revenue and livelihood in Haiti, little has been done by the government to address the decline in resources and increase in demand of land and products over the last several decades (FAO). Lack of investment in the agricultural sector has resulted in unsatisfactory performance in terms of export profits meeting local needs. Government policies related to the sector have long been aimed at securing income for the government and government officials through taxes and regulation instead of providing resources and incentives for appropriate land use (Jaramillo & Sancak, 2009). High levels of consumption and lack of financing available to rural farmers for innovation contribute to lack of technical advancement in the sector. While Haiti was successfully able to support most needs of its population until the 1950s through subsistence farming and agricultural production, there was a recession caused by political disarray, which was compounded by lack of restructuring to modernize its economy.

Economic growth often determines a nation's financial ability to allocate funds to environmental and social programs (Epstein & Buhovac, 2014; Lorek & Spangenberg, 2014; Naidoo & Ricketts, 2006). In the Dominican Republic's case, the economic growth it experienced partially trickled down to lower-income populations (Lockner, 2013). Additionally, the diversification of its economy post-Haitian occupation allowed for the Dominican Republic to think about reform within its financial and governmental systems (Jaramillo & Sancak, 2009).

4.3 Politics

Citizens depend on governments to provide structure, protection and constitutional rights. The political landscape in Haiti is marred by inefficiency and inexperience, which contributes to a lack of basic health, educational and infrastructural needs (Reinders, 2014). Today, Haiti is classified as one of the most corrupt countries in the world (Roc, 2008). Corruption permeates all of its institutions and has become an acceptable way to circumvent administrative red tape to accomplish local projects (Dubois, 2012; Ferrer, 2012). In order to have secure funding, or to develop and implement a program, there must be an existing personal relationship with an individual that holds discretionary power within a governmental institution (Tippenhauer, 2010). The Haitian national government has not been proactive in addressing environmental issues and has passed responsibility to local governments. Conflict between the local government and national government agencies is pervasive and as a result

preservation and promotion of natural resources is very weak and not enforced (Lockner, 2013; Sheller & León, n.d.).

The Dominican Republic readily accepted foreign investment and engagement to strengthen its economy, as well as its international relationships, generate revenue, and create employment opportunities, by creating large tax exemptions for investment in tourism development in the 1990s (Nunes, 2016). Although these tax concessions were supposedly aimed to help the Dominican poor, the few who benefited were the small group of national elites with the majority of Dominicans remaining in poverty (Nunes, 2016). Eventual economic growth has allowed for some improvement in socio-economic program development; establishment of assistance programs for low-income and a stronger education system encouraged positive growth of the population's ability to contribute to the continued success of the economy through producing a skilled labor force, however, a significant of the population remains employed in low-paid, seasonal, and unstable jobs (Frankema & Masé, 2014; Nunes, 2016).

4.4 Conservation

Rapid population growth and stagnant agricultural profits have caused a steady deterioration of Haiti's resource base. Regulations that have been put in place by the government have had minimal success because of the lack of financial and technical means necessary to ensure compliance (Dolisca et al., 2009a). For example, to regulate forest conservation an individual would require an understanding of the current state of natural resources, associated policies and regulations, actions that are permitted (amount of logging, allowable land

clearing), and basic knowledge of economics at the very least. This level of expertise or the capacity for workforce development is not available in Haiti.

A gradually deteriorating economy coupled with an unstable political environment has had confounding effects on natural resources. The Haitian population relies heavily on slashing and burning of forests for agricultural purposes because that is the easiest and fastest way to secure income (Posner, Michel, & Toussaint, 2010; Roc, 2008). Slash and burn is a practice that might be sustainable in areas with a low population and time for forest recovery between clearances, but not in areas with high populations such as Haiti. Opportunities to correct unsustainable land use practices are limited. Studies estimate that in the 15th century, 85% of Haiti's territory was forested; today the remaining forest cover is estimated to be just 2-4% of the area of the territory. Though, there has been some research conducted by individual practitioners that argues forest coverage has not been accurately calculated and it is currently in the 29-33% range (Churches, Wampler, Sun, & Smith, 2014).

The Dominican Republic's forest cover decreased from about 75% of the overall territory in 1922, to 12% in the 1980s. However, the proportion of forest cover has rebounded to 40% (FAO). Healthy forest cover is of particular importance in the Dominican Republic because it has an exceptionally high rate of endemism with 40% of its fauna, and 32% of its flora species being endemic (Cano-ortiz, Musarella, Fuentes, Gomes, & Cano, 2016). It is also at an advantage because it has more arable, flat land, which is conducive to agricultural production. The Dominican government has created over 120 national legal regulations

regarding forestry over the past 120 years and has made a concerted effort to curb unsustainable land use practices, including the illegal production of charcoal, however, the effectiveness of these efforts has been debated (Holmes, 2014). Due to the decrease in viable farmland and forest cover on their end of the island, Haitians have turned to illegally producing charcoal on the Dominican side of the border (Michel & Kendall, 2013).

Despite having similarities in their historical development, Haiti and the Dominican Republic have been on divergent developmental paths since the late 1950s (Stoyan et al., 2016). The Dominican Republic has had a slight edge because of its transition to a more stable political foundation after its democratization, whereas Haiti continued under authoritarian rule until the 1980s (Morgan, Hartlyn, & Espinal, 2011). The emergent Dominican political party system is one of the few stable political structures in the Caribbean region (Morgan et al., 2011). The Dominican Republic has transformed from a rural country reliant on sugar exports to a predominantly urban country with a globalized economy. However, there are still social and localized economic issues being faced by the Dominican population outside of the major cities, which incidentally is also where deforestation is the greatest (Stoyan et al., 2016).

Haiti has been affected by social, political, and economic instability since 1986, which has caused stagnant economic growth and fostered an environment filled with leadership that lacks accountability and is plagued by corruption (Dupuy, 1997). Populations in both countries are faced with multifaceted issues that

contribute to high levels of deforestation that must be addressed in order for conservation efforts to be effective.

Chapter 5: Methodology

5.1 Qualitative Research

Qualitative research by design employs sample selection that is usually non-random, purposeful and small, and aims to develop an understanding of a research topic through interviews, observations or document analysis (Merriam & Tisdell, 2015; Miles, Huberman, & Saldana, 1984). Research that falls into this category has an emic focus on participants' terms and viewpoints with the collection of significant data on a few cases rather than a few data on many cases allowing for analysis that identifies important themes (Miles, Huberman, & Saldana, 2014; Patton, 1990). The process as a whole is inductive and the data gathered is used to build concepts, hypothesis, or theories as opposed to conventionally deductive testing of a hypothesis. There are also some instances of researchers taking the deductive pathway in which a hypothesis is established and tested through data collection. The product of qualitative research is richly descriptive and shows how concepts are interconnected. As qualitative researchers collect data, they revise their frameworks to make them more precise given that they are simply an iterative explanation of the phenomena being investigated (Baxter & Jack, 2008; Miles et al., 1984; Patton, 1990). This is an important consideration given that the themes that emerged in this research do not directly align with the conceptual framework proposed at the onset of this

research. Conceptual structures must permit movement between the original conceptualization and that which occurs after data has been collected (Ritchie & Lewis, 2003). One of the drawbacks of conceptual frameworks is that they limit the inductive approach, so it is often recommended that researchers introduce conceptual frameworks later in the process to avoid the loss of detailed data and potential restructuring of findings to fit preconceived ideas (Baxter & Jack, 2008; Huberman & Miles, n.d.).

5.2 Participant Interviews

As noted before, this research, being qualitative in nature, used interviews of practitioners that have worked on the island of Hispaniola, in order to address the following research questions:

1. What factors have hindered the effectiveness of forest conservation on the island of Hispaniola according to conservation practitioners?
2. To what extent do conservation professionals evaluate efforts on Hispaniola as effective?

The framework to analyze the effectiveness of conservation on the island of Hispaniola is specifically based on evaluating the management component of monitoring and evaluation, community engagement, and governance as literature indicates they are vital in ensuring conservation success.

Key practitioners, who in the context of this research are identified as individuals with research backgrounds that have worked with local NGOs, international organizations, or in a management capacity in relation to

conservation projects on the island of Hispaniola, were identified through initial online research of relevant Haiti and Dominican Republic specific publications. Snowball sampling was used to expand the base of practitioners and connect with additional individuals who could provide perspectives specific to their conservation experiences on the island. Practitioners were sought out because of their specialist knowledge and those chosen were a mix of researchers associated with universities, international organization representatives, local NGO representatives, and the government researchers. A total of 10 practitioners provided responses through a mix of email dialogue, telephone interviews, and in-person meetings. Participants were granted anonymity in exchange for their participation in this research, so that they could detail their personal experiences and provide honest opinions without fear of identification. In order to be considered, their projects were required to address conservation as aligned with one of the following topic areas as guided by the literature review:

- Tropical deforestation
 - Examples of research areas include: land-use practices and management, such as illegal logging, shifting cultivation, slash and burn; agroforestry; and sustainable development
- Governance
 - Research within this category can address environmental governance overall or forest-related governance specifically

- Socio-economic development

The proposal for this research was submitted to George Mason University's Institutional Review Board (IRB). The solicitation letter used to contact practitioners for participation can be found in Appendix 1 and transcripts of interviews can be found in Appendix 2.

Each participant was asked the following questions through semi-structured interviews:

1. In your experience, what role do forests play in agriculture-based communities?
2. Do tropical forests face region specific threats in comparison to other forest types?
3. What are the usual driving forces behind deforestation?
4. Generally speaking, how is success defined in conservation of natural/protected areas?
5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?
6. Are there specific stakeholders that are always involved in the development of a conservation plan?
7. What role, if any, do local communities play in implementation of conservation plan?
8. What particular land management strategies more successful than others?

9. Does conservation have a positive economic impact in the region?
10. What is the average duration of a conservation project?
11. In your view, what is the biggest factor that contributes to success of conservation projects?
12. In your view, what is the biggest challenge with conservation projects?

The majority of the interview questions were framed in an open-ended manner to encourage full, meaningful responses from practitioners that could provide insights based on their own knowledge and experiences. For example, instead of asking whether governance was an important contributing factor to the effectiveness of forest conservation, which may have resulted in a simple one-word answer, the practitioner was asked whether there were particular land management strategies that were more successful than others. Land management strategies dictate how land is managed, what rules and regulations are in place, and ultimately is dictated by the national governments in Hispaniola. Instead of asking whether monitoring and framework were important, practitioners were asked what informed the parameters of projects. Careful consideration was taken to avoid questions that could be considered “leading”.

The goal of this questionnaire was to gain insights into the views of individuals who have worked on conservation projects on the island of Hispaniola and to determine how their responses align with what literature has shown to be necessary for effective conservation. All interviews were collated to create a case

study that will contribute to the formation of a framework to evaluate effectiveness of projects that can serve as the preliminary foundation for improvement of conservation practices on the island.

5.3 Limitations of this method

It is important to note that despite the nature of qualitative studies focusing on a small sample size, there was an attempt made to cast a wider net to include additional practitioners who have worked on the island of Hispaniola. Unfortunately, many of the conservation projects on the island had different scopes of interest and did not fall within the topic areas necessary to be considered for this research. For example, there were several research projects related to conservation, but had a marine focus and could only be tangentially tied back to this research. Additionally, of the forest conservation work identified, there was difficulty in connecting with practitioners because of changes in employment, lack of contact information and lack of response to email outreach. For future research endeavors, it would be valuable to spend an extended amount of time on the island and to conduct in-depth interviews with individuals in local communities. There is some literature on perceptions of local farmers but it is limited in geographic range and dated.

5.4 Data analysis

Qualitative data analysis involves the identification, examination, and interpretation of patterns in textual data and determines how these themes may answer research questions that have been posed (Miles et al., 1984). Analysis is not guided by universal rules and is a fluid process dependent on the researcher.

The data collected through practitioner interviews was categorized based on themes that emerged based on key word identification. Qualitative data analysis often follows an inductive approach in that explicit theories are not imposed on the data in the test of a particular hypothesis or framework (Suter, 2012). The emergence of conceptual categories and descriptive themes from the data collected guide the interpretation of the conceptual framework, as was done through an iterative process for this study (Huberman & Miles, n.d.).

During the familiarization phase, the data collected through interviews was reviewed to obtain an understanding of the range and diversity of responses. The familiarization process provides researchers with the opportunity to read through data in detail and identify key ideas and recurrent themes, which helps to start the process of abstraction and conceptualization. Typically, the familiarization process is followed by the identification of a conceptual/thematic framework and researchers draw upon a priori issues, emergent issues and arising themes to inform its development (Huberman & Miles, n.d.; Ritchie & Lewis, 2003). Data reduction of the interview transcripts followed the familiarization phase and streamlined the identification of predominant themes and underlying data associated with each, which was then used to create a content cloud through Wordle software. Transcripts often involve a large amount of content, so data reduction helped in removing filler text, random tangential responses, and the actual questions themselves to create the word document that was uploaded to the software. Content clouds are useful in interpretation of data and the identification of emergent themes where the

words appearing in the largest font depict frequency, thereby highlighting areas of priority (Brooks, Gilbuena, Krause, & Koretsky, 2014; Cidell, 2010).

Chapter 6: Results and Discussion

This chapter will detail the findings of this research, address each of the emergent themes identified based on practitioner interviews, and provide an updated conceptual framework.

6.1 Reoccurring Themes

A full summary of the responses from participants is provided in Appendix 2. A number of recurrent terms appeared in the participant interviews, and these terms and their frequency of occurrence are visualized in the word cloud in Figure 1.3.

Local communities are living in strained circumstances that require them to proceed with environmentally costly land use practices with short term economic gains instead of those that protect natural resources and deliver long-term social and environmental gains (Reed et al., 2016). Poverty, low education levels, and lack of engagement with local communities contribute to deforestation and impact Haiti to a greater extent than the Dominican Republic. Both countries practice a predominantly “top-down” approach when it comes to conservation, essentially creating policies and programs without addressing local contexts; this further decreases the likelihood of local communities adhering to restrictions placed upon them that are seen as an infringement on their rights. Local communities are not given the opportunity to provide input towards the development of conservation plans despite having unique insights related to farming practices and beliefs, that if addressed, could have positive impacts. Local communities being predominantly excluded from conservation is not specific to Hispaniola, as literature confirms that the majority of conservation does not actively engage with locals. Literature has also shown that community managed conservation has resulted in lower annual deforestation rates when compared to protected areas (Porter-Bolland et al., 2012).

“They [local communities] always play the most important role. If they do not participate, the plan fails. If they do not agree in the approach taken to execute the plan, the plan fails. If the plan is successful, it is because the local community realizes it is in their best interest considering the alternatives.” – practitioner from Haiti

“[Land management] strategies including local communities and stakeholders are more successful than others.” – practitioner from Dominican Republic

Local perceptions of conservation, whether negative or positive, are framed based on information they are provided, forms of engagement, and whether they feel they can trust the individuals and organizations working near their homes have their best interest at heart; these perceptions determine whether they will contribute to efforts, or hinder them by proceeding in a “business as usual” fashion (Vodouhê et al., 2010).

“In a highly specialized sector, you cannot hand a farmer instructions on production and have him read them. The ability to learn and adapt and respond accordingly has to be addressed through education of locals.” – practitioner from Dominican Republic

Ensuring that information exchange happens in a form understood by locals that have low levels of education calls for researchers to identify an appropriate channel of communication as a part of their plan’s development. Local NGOs, community leaders or previous researchers with established relationships can support these efforts by informing engagement methods, such as town hall style meetings, small gatherings based on neighborhood, or on an individual basis, based on their experience. Engaging with local communities provides a platform not only for knowledge sharing, like farmers exchanging historical information about their land with practitioners, but also allows locals to feel that they are

being heard and that their opinion matters. This open forum also provides project leaders with insights into what contributing challenges exist that locals are facing that should be integrated in project design.

There is also the fundamental issue of low levels of education that compound the inability of conservation actors to hand locals information explaining why and how their actions contribute to a decrease in natural resources. The influx of migration on both sides of the border in Hispaniola and growing populations of people that rely heavily on the land for their livelihood also calls into question the need for diversification of the economy as a means to reduce pressures on the natural environment.

6.1.2 Economic Aspects

Developing countries are reliant on commercial scale agriculture for national economic growth and often subsistence agriculture for economic stability at the individual level; this is especially true in Haiti and the Dominican Republic. Impoverished communities continue to persist and, according to literature and practitioners, this continues to contribute to deforestation. Both countries have also not yet advanced from cheap, unsustainable fuel sources with charcoal production and wood fuel serving as additional pressures to forested land. Additionally, the fact that Hispaniola has experienced a significant number of dictatorships has contributed to the rate of deforestation, which has been shown through empirical analysis to be true for non-democratic nations (Engle, 2017).

According to literature and practitioners, there is an untapped opportunity to leverage the local community in monitoring and evaluation and project design in conservation.

“Participatory decision making within the local community to manage the land for an alternative purpose and providing opportunities and incentives is an important factor that contributes to success.” –practitioner from Dominican Republic

Instead of a payment for ecosystem services system, that traditionally pays local communities to not destroy forested land and has limited ability to improve conservation, a more effective solution would be to employ locals (Mohebalian & Aguilar, 2016). Compensating local communities for their work in monitoring progress, contributing to the evolution of project mechanics, and teaching others in the community would help generate additional income, while integrating cultural contexts (Börner et al., 2016; Dolisca, McDaniel, Shannon, & Jolly, 2009b). This would also give the community a sense of ownership, which is valuable in an area where insecure land tenure and political issues feed into deforestation (Griffith-Charles, Spence, Bynoe, Roberts, & Wilson, 2015; Smucker, White, Bannister, & others, 2000; Zuvekas Jr, 1979).

Responses also touched on the importance of diversification of the economy suggesting that by leveraging economic valuation of forests within conservation plans and pivoting towards greater income generating products and eco-tourism options, local communities would be given more options to sustain their

livelihoods. Practitioners also relayed that conservation can be viewed in a negative light by local communities because it does not generate income in the short-term despite its potential long-term benefits. Tropical forests are home to a significant portion of the world's poor making it impossible to address deforestation without also providing strategies to alleviate poverty and establishing trust and dialogue with local communities (Paneque-Gálvez, McCall, Napoletano, Wich, & Koh, 2014).

6.1.3 Governance Aspects

Governance is limited and ineffective in both Haiti and the Dominican Republic. The greater issue expressed by practitioners was that there is a severe lack of enforcement of policies that ensure that established protected areas remain off limits, that proper resources are available to follow-through with their management, and the monitoring of additional regulations occurs on a steady basis. The Dominican Republic has proactively instituted legislation that established protected areas to conserve forests and regulations to prevent deforestation, however, literature and the results of this research show that these efforts have not maximized effectiveness.

“Success has been measured in terms of percentage of land established as protected area, but this doesn’t guarantee proper management of the areas included. Most of the main [protected areas] have suffered significant deforestation during the last decade.” – practitioner from Dominican Republic

Lack of funding, prioritization, and poor management significantly impact conservation work making it difficult to actualize goals. The noticeable lack of local leadership continues to contribute to a cycle of corruption and political instability feeding into the inability to effectively conserve forests. Land rights issues are also especially prevalent on the island of Hispaniola and collaborative governance offers a potential pathway for local communities to feel a sense of ownership and counteract state interventions, which have devalued property rights (Ruiz-Mallén, Schunko, Corbera, Rös, & Reyes-García, 2015).

Engaging with local communities in project design and implementation has a positive impact on governance, which may otherwise be seen as a burdensome restriction applied by governmental leaders that don't understand local struggles. Top-down approaches, such as the unilateral establishment of protected areas, don't take into account the needs and concerns of locals, as mentioned by practitioners.

"In Hispaniola, rural communities are not considered stakeholders, but rather a threat to protected areas and, as a result, they are only involved in conservation plans in the few cases where those communities are organized or supported by a local NGO. Government representatives from different agencies and international agencies or NGOs – when they provide funding for specific projects – play a disproportionate role in developing conservation plans." – international NGO

In some cases, locals can be seen as a threat to conservation despite the obvious interest they have given the opportunity to collaborate towards solutions that will preserve the resources they depend on. Governance, by definition, determines how decisions are made and implemented.

“In my experience, inclusion of local communities and stewards in the management of conservation areas is the biggest key to success.” – practitioner from Haiti

The idea of collaborative governance, which gives the local community a voice, fosters learning and adaptability, appears to be the underlying solution based on responses received regarding barriers to success of conservation, as well as one of the most effective management strategies (Alexander, Andrachuk, & Armitage, 2016; Bernauer & Gampfer, 2013; Macura et al., 2015; Nolte et al., 2013).

6.1.4 Management Aspects

Practitioners interviewed for this research consistently emphasized community engagement as a pathway to improve contributing components of effectiveness of forest conservation, especially the management component. The insights provided were based on experiences specific to the island of Hispaniola and may not translate as solutions within other countries that are also faced with high deforestation rates. Community based conservation (CBC) has become increasingly important in developing countries because of concerns that centralized forest ownership, in this case land which is owned by Haitian and Dominican governments, has failed to result in sustainable management that

also addresses underlying social and economic issues (Baynes, Herbohn, Smith, Fisher, & Bray, 2015).

“Not aware that the government measures any quantitative or qualitative parameter that indicates ‘success’. Right now, they appear to only be concerned with establishing protected areas, but not necessarily providing sufficient resources to protect them. Not enough budget to adequately conserve protected areas combined with corruption and local politics keeps conservation from every becoming a reality.” – practitioner from Haiti

“Poverty in imposed protected areas with no effective management, insecure land tenure, population growth, internal migration, and corruption encourage deforestation.” – practitioner from Hispaniola

Co-management schemes, which allow communities, public and private organizations to work together on forest governance and management, result in the enhancement of local well-being, while also protecting ecosystem functions and biodiversity (Alexander et al., 2016; Ruiz-Mallén et al., 2015). Haiti’s population in particular has a history of marginalization and oppression at the hands of its government (Dubois, 2012). There is a lack of trust in government established protected areas, and despite their lack of effective management, are beneficial to them in the long run (Dolisca et al., 2009a; Lutz, Pagiola, & Reiche, 1994).

“Forests provide many essential ecosystem services, but most agriculture-based communities are not aware of it. Still prevails the notion from colonization times, that forests are non-productive loss lands.” – practitioner from Haiti

Furthermore, the Haitian population has had limited engagement and lacks the knowledge and education levels necessary to understand on their own the impact of deforestation on their overall livelihood. Practitioners spoke to the importance of forests calling out direct and indirect benefits that are in jeopardy, including vital ecosystem services, such as ensuring proper water and soil quality. Lack of long-term commitment and capacity to manage were noted as significant barriers to conservation efforts. Agricultural expansion and the social aspect of communities not understanding why clear-cutting forests is going to reduce their income because of diminished returns requires management efforts that integrate local needs.

6.2 Adapting the framework

Given that the conceptual framework should continue to develop and be completed as the study progresses and that the emergent relationships and concepts must reflect the data collected, the initially proposed conceptual framework was updated.

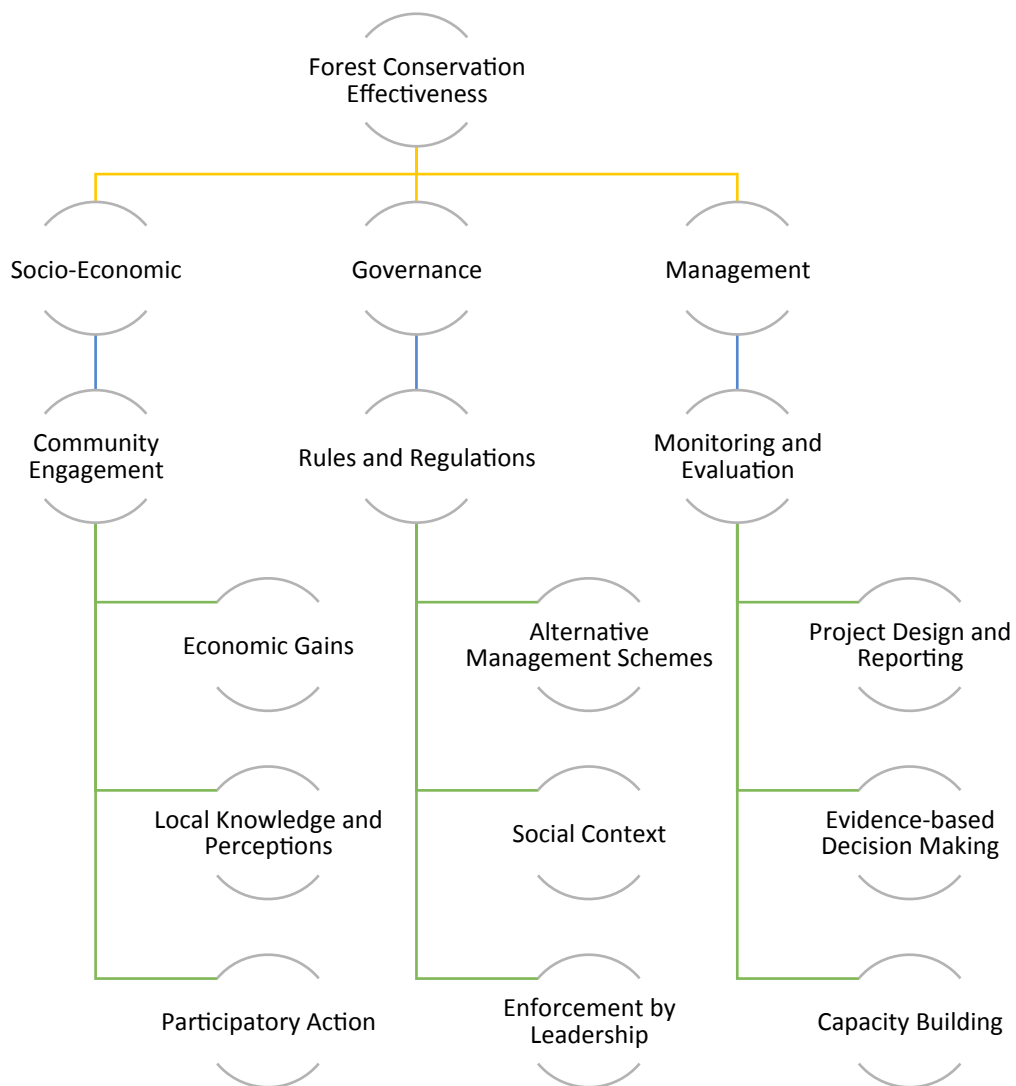


Figure 1.4 Updated conceptual framework based on data collected

Figure 1.4 reflects the new relationships by changing the following:

- Addition of broader layer of concepts (socio-economic and management);
- Shift of governance to broad concept level;
- Addition of rules and regulations as new a combination concept;

The broad concepts were used to more accurately categorize and encompass the data collected.

Chapter 7: Conclusions

This chapter will revisit the research questions this research set out to answer, touch on the interview responses received in the context of concepts within the framework, and culminate in thoughts for potential for future progress.

Conservation biology is rooted in quantitative analysis, which often limits the ability of researchers to look at the underlying qualitative factors that impact effectiveness (Drury, Homewood, & Randall, 2011). Given the abundance of existing quantitative research, this study utilized a qualitative approach to answer the following research questions:

1. What factors hindered the effectiveness of forest conservation on the island of Hispaniola according to conservation practitioners?
2. To what extent do conservation practitioners evaluate efforts on Hispaniola as effective?

As identified through literature review and interviews with practitioners, the main factors that have contributed to forest conservation on the island are rooted in Haiti and the Dominican Republic's respective history, and the dictatorships that shaped environmental policies, or lack thereof. Policies that

were enforced, for example in the Dominican Republic, did not necessarily result in effective forest conservation because those in political power dictating policy were taking advantage of the land for their own financial gains. Interviews with practitioners allowed for a more in-depth look at additional factors that hinder effective conservation with responses based on their personal experiences indicating that the barriers fall into four broad categories: social, economic, governance, and management. Social issues including poverty, low levels of education, and exclusion of local communities in conservation efforts altogether emerge as a significant root cause of the continuation of deforestation on the island. Impoverished communities often lack opportunities for economic growth, especial in countries like Haiti where subsistence farming and lumber products, such as fuel wood and charcoal, are the predominant source of income. Lacking alternatives to maintain livelihood is another reason that hinders conservation progress on the island. The Dominican Republic has experienced some forest recovery thanks to its historical economic diversification and the implementation of protected areas, however, there continue to be governance and management issues impacting the effective protection of forested land. The governance style of both Haiti and the Dominican Republic integrates the establishment of protected areas, but a lack of resources and enforcement on both ends of the island render the major of these ineffective. Lastly, lack of capacity building resources and ineffective project mechanics that do not properly integrate monitoring and evaluation, have resulted in poor management and lack of long-term commitment to conservation.

Pathways to the improvement of forest conservation rely heavily on addressing the social economic, governance and management issues in a holistic manner with each component being addressed in all suggested solutions. Practitioners expressed the importance of elevating local communities as a means to create these comprehensive solutions with longevity to ensure that conservation efforts do not stop when programs and associated funding end. This case study based qualitative research has joined the growing amount of conservation literature calling for practitioners to leverage local communities as a powerful resource not only to alleviate burden on project staff, but also to instill the importance of conserving natural resources and increase the likelihood of preservation in the long run.

Appendix 1

Research solicitation letter

Recruitment Email and Consent

*Hello (**Participant Name**),*

I am a graduate student at George Mason University working towards my Master's in Energy and Sustainability. My thesis is focused on current conservation projects in Haiti and the Dominican Republic and how their success can translate to the development of overall conservation strategy for the island of Hispaniola.

*I'm interested in learning more about your research and personal experiences in (**project details as related to conservation on the island of Hispaniola**).*

*Would you be willing to respond to the questionnaire below (**include questions in initial email**) for inclusion in my research? It should take approximately 45 minutes to one hour to complete and will provide insights that will be valuable to integrate into my thesis. Based on responses provided, I may contact you for clarification.*

Thank you in advance for your time and assistance.

Best,

Monica

Monica Kanojia

MAIS, Energy and Sustainability

George Mason University

Please note that your participation is voluntary and that completion of the questionnaire is consent for taking part in the study. Individual responses may be described in research reports, however, your identity and affiliation will remain

anonymous. Below you will find the contact information the university's IRB office, my advisor, and I.

Monica Kanojia is conducting this research for her thesis with the MAIS department at George Mason University. She may be reached at 703-975-7799, or via email at mkanojia@masonlive.gmu.edu, for questions or to report a research-related problem. Her advisor Dr. Chris Parsons may also be contacted, if necessary, at 703-993-1211, or via email at ecm-parsons@earthlink.net. You may contact the George Mason University Office of Research Integrity & Assurance at 703-993-4121 if you have questions or comments regarding your rights as a participant in the research.

This research has been reviewed according to George Mason University procedures governing your participation in this research.

Appendix 2

Questionnaire Responses

Questionnaire Responses – Haiti, Participant #1

1. In your experience, what role do forests play in agriculture-based communities?

The maintenance of some type of forest canopy is important for crops such as coffee.

2. Do tropical forests face region specific threats?

In the Caribbean (Haiti in particular) the need for construction material and fuel wood/charcoal are the primary driving forces for forest loss. The lack of fuel options and the lack of forest management plans leads to destructive practices.

3. What are the usual driving forces behind deforestation?

Fuel needs (fuel wood and charcoal) and land clearing for agriculture and construction. Wild/feral animals as well. Goats and cows, as far as I'm concerned, are causing much more damage than humans.

4. Generally speaking, how is success defined in conservation of natural/protected areas?

How much forest remains (how many trees have been planted).

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

The reduction of forest loss.

6. Are there stakeholders that are always involved in the development of a conservation plan?

Not always, but we have found that it tends to help (A LOT!). There tends to be too much of a top/down approach in Haiti without really involving the local stakeholders. Trust me, I can see why this would be (is) more attractive, but without the local stakeholder's involvement you are doomed to failure (unless you use strong-arm policing).

7. What role, if any, do local communities play in implementation of conservation plan?

As above, often none (and even less long term).

8. Are particular land management strategies more successful than others?

We (all of us) have tried various strategies, but nothing seems to work. Without options and strong-arm law enforcement nothing will work.

9. Does conservation have a positive economic impact in the region?

Not yet, not really. We have not yet been able to capitalize on the potential economic impacts of conservation (i.e. eco-tourism, and agricultural independence).

10. What is the average project duration?

Usually no longer than 5 years, 1-2 years is more likely.

11. In your view, what is the biggest factor that contributes to success of conservation projects?

Having the local communities implicitly implicated in the project from design to

implementation. It would be nice to also have fuel options, control of feral animals, and law enforcement capabilities.

12. In your view, what is the biggest challenge with conservation projects?

Everyone wants results yesterday (these things take time). Lack of funding, lack of focus, lack of public sector capacity, corruption are big challenges.

Questionnaire Responses – Dominican Republic, Participant #2

1. In your experience, what role do forests play in agriculture-based communities?

Forests provide many essential ecosystem services, but most agriculture-based communities are not aware of it. Still prevails the notion from colonization times, that forests are non-productive loss lands.

2. Do tropical forests face region specific threats?

I do not think so. Threats are very similar, with root causes related mainly to poverty and inadequate policies.

3. What are the usual driving forces behind deforestation?

Agricultural expansion, both legal and illegal, both outside and inside protected areas. Also, charcoal production mainly for the Haitian market.

4. Generally speaking, how is success defined in conservation of the Dominican Republic's natural/protected areas?

Success has been measured in terms of percentage of land established as protected areas. It was the main indicator for the MDG (Millennium Development Goal). But this

does not guarantee proper management of the areas included. Most of the main areas have suffered significant deforestation during the last decade.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

They are established during formulation of the projects, in concordance with the objectives of the financial mechanism.

6. Are there stakeholders that are always involved in the development of a conservation plan?

The development of conservation plans has been evolving positively, from no or little participation of stakeholders to a relatively broad participation.

7. What role, if any, do local communities play in implementation of conservation plan?

In some cases, but few, they form part of the management structure.

8. Are particular land management strategies more successful than others?

Strategies including local communities and stakeholders are more successful than others.

9. Does conservation have a positive economic impact in the region?

Mostly in terms of ecotourism development and activities. Economic valuation of protected areas services has been estimated and of coastal marine ecosystems, but they are not widely known or used.

10. What is the average project duration?

Four or five years

11. In your view, what is the biggest factor that contributes to success of conservation projects?

Motivation and commitment. In that respect, the work of NGO is more positive and sustained, since most of their members are working mainly by their motivation to work for conservation of natural resources, biodiversity and sustainable development.

12. In your view, what is the biggest challenge with conservation projects?

Financial support, in the mid and long term.

Questionnaire Responses: Caribbean, Participant #3

1. In your experience, what role do forests play in agriculture-based communities?

There are no real forests left in the operating zone but lots of scattered trees and shrubs across the landscape. There are some areas where the tree cover is fairly dense (mainly cacao agroforests). Trees are multipurpose and are used for a number of products and services: fuel wood, charcoal, poles and lumber (for construction), fodder for livestock, soil conservation (when planted along contours in sloping areas), food (fruit and nuts). Some products are sold and contribute to household revenue (e.g., fruit, cacao, valuable timber).

2. Do tropical forests face region specific threats in comparison to other forest types (boreal, temperate)?

The threats vary depending on what region you're talking about.

3. What are the usual driving forces behind deforestation?

In northern Haiti, I would say expansion of agricultural land, shorter and shorter fallow periods in shifting cultivation areas and need for fuel wood/charcoal would be the main driving forces.

4. Generally speaking, how is success defined in conservation of natural/protected areas in Haiti?

In my opinion, success should generally be defined by (1) maintenance/conservation of the natural features of the areas (native/endemic flora, fauna and the whole ecosystem), (2) participation of local/neighboring communities in the conservation of the areas (local stewards), and (3) some benefits from the conservation efforts accruing to the local stewards.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

Normally the framework, goals, etc., should depend on the needs of the stakeholders which will likely include the government [national, regional and local authorities] and local communities; it will also depend on the priority/unique natural features one wants to conserve and these can be identified and prioritized using a conservation planning process and software. Reporting and management will depend on who the managers are but would hopefully include representatives from a govt. agency, perhaps an NGO to whom management authority has been delegated, and local communities (i.e., ideally a co-management regime).

6. Are there stakeholders that are always involved in the development of a conservation plan?

I would say govt. agencies/representatives are always involved; local communities and local authorities should always be involved but I know that is not always the case (e.g.,

PN3B [Parc National de Trois Baies] -- should have consulted more with local communities but I don't think much consultation occurred). To my knowledge, the PN3B remains largely a "paper park" and business as usual is occurring in the area it covers.

7. What role, if any, do local communities play in implementation of conservation plan?

I don't think the local communities have had much of a role in implementing conservation plans in northern Haiti – partly due to the dearth of PAs (official or other) in the area... But they should definitely have a co-mgt./stewardship role (and be compensated for this role in one way or another!) if and when new PAs are established.

8. Are particular land management strategies more successful than others?

The incorporation of economically beneficial species to promote soil conservation/agroforestry along contours in sloping areas. This includes fruit and nut species (e.g., Mango, Cashew) and species that will eventually provide timber/wood that can be sold (e.g., Mahogany).

9. Does conservation have a positive economic impact in the region?

Soil conservation efforts in the sloped uplands should have a positive economic impact by maintaining soil fertility and farm productivity while also decreasing siltation and flooding in the lowlands/downstream areas.

10. What is the average duration of a conservation project?

Typically 5 years.

11. In your view, what is the biggest factor that contributes to success of conservation projects?

In my experience, inclusion of local communities/stewards in management of conservation areas is the biggest key to success.

12. In your view, what is the biggest challenge with conservation projects?

In my experience, getting local people to “buy-in” to conservation and realize concrete benefits from it is the biggest challenge.

Questionnaire Responses: Haiti, Participant #4

1. In your experience, what role do forests play in agriculture-based communities?

Forests are a source of fertile soil (hence clearing them for gardens), fuel wood and charcoal, fruit, medicinal plants. Ecosystem services such as regulating water, maintaining soil fertility, microclimate effects, biodiversity, etc. are not taken into account when exploiting the forest for immediate benefits (charcoal, fertile soil for gardens).

2. Do tropical forests face region specific threats?

These threats are common to all areas where people are living 100% off the land. They need fertile soil to grow their own food and cash from the crops that they grow or the wood that they exploit. Occasionally, they will sell the wildlife as well (parrots, parakeets, doves).

3. What are the usual driving forces behind deforestation?

The main driver of deforestation is agriculture - both plant and animal foods that people enjoy eating. Beans, corn, sweet potatoes, yams, goats, cows, chickens, okra, melon, rice, manioc, pigs. Charcoal is often the scapegoat for deforestation, but charcoal is only made from wood that is cut down to create a garden or pruned from trees to let more light to the garden plants. In areas where there are no gardens, livestock (goats, horses,

mules, cows, donkeys) graze on the grass, herbs and shrubs so that forests can never recover. Also fires are lit to clear the land and these fires dry out the soil and do not allow tree seedlings to germinate and regenerate new forests.

4. Generally speaking, how is success defined in conservation of natural/protected areas?

I am not aware that the government of Haiti measures any quantitative or qualitative parameter that indicates "success." Right now, they appear to be only concerned with establishing protected areas on the map, but not necessarily providing sufficient resources to protect them. The Ministry of Environment does not have the budget to adequately conserve the areas that they are responsible for. And there is corruption and local politics that keep conservation from ever becoming a reality.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

Generally, the only times that such parameters are addressed is when a donor (e.g., UNEP, UNDP, World Bank, IADB, USAID, EU, etc.) requires as an obligation for funding purposes. Perhaps the Haitian government would initiate the process if they had the resources, including the competency, to do so. To date, they have failed to do so.

6. Are there stakeholders that are always involved in the development of a conservation plan?

The main stakeholders are those with a scientific understanding of the ecology of conservation. These plans are done by biologists that value conservation. Certain members of the professional business class that are concerned also get involved, as well as members of the government that are tasked to do this type of work. Occasionally, non-government organizations take the lead and this is somewhat dependent on the

amount of funding that is available to develop such plans. However, a plan is a plan - it does not work if it is never executed.

7. What role, if any, do local communities play in implementation of conservation plan?

They always play the most important role. If they do not participate, the plan fails. If they do not agree in the approach taken to execute the plan, the plan fails. If the plan is successful, it is because the local community realizes it is in their best interest considering the alternatives.

8. Are particular land management strategies more successful than others?

It depends somewhat on what you determine to be successful in terms of conservation. The first private forest reserve in Haiti is being established, but it is too early to know if private ownership and management will be any better than public lands. As long as any land in Haiti is accessible to people, it will be likely be exploited for some form of agriculture, tree cutting or grazing. The more isolated the land is from the urban areas, the more likely it will be in some sort of natural state. Certain non-government organizations have been successful to cover mountain slopes with trees, but they have done this through outside funding and generally under management of people who are not local to the area. I wonder if this would be something that could be sustained without external sources of capital or "outsiders".

9. Does conservation have a positive economic impact in the region?

Conservation has a positive economic impact, however it does not always translate to jobs and economic prosperity. In fact, when Haitian consider "opportunity costs", conservation to many have a negative economic impact since short-term cash is not generated.

In the case of Haiti, the benefits of natural areas provides clean water and healthier environments despite the fact that no one is willing to pay hard earned cash for these services. Mangroves are nurseries for many of the important fish, shellfish and crustaceans that fishers depend on for their livelihood. They also protect the coast against erosion of storm surges and hurricanes and make land by keeping up with sea level rise as a result of climate change. But the conservation ethic is not well established enough among the land users for any demonstrable impact to be measured.

10. What is the average project duration?

Generally 3-5 years.

11. In your view, what is the biggest factor that contributes to success of conservation projects?

Participatory decision-making within local community to manage the land for an alternative purpose and providing opportunities and incentives so that such alternatives are viable.

12. In your view, what is the biggest challenge with conservation projects?

Political instability, insufficient human resources to practice science-based land management strategies, lack of government support, lack of education among local communities, illegal poaching (trees for timber and charcoal, wildlife, ornamental plants), invasive species.

Questionnaire Responses – Caribbean, Participant #5

1. In your experience, what role do forests play in agriculture-based communities?

Scientists know what they are going to do. Communities are more informed and the distance between scientists and communities is compressed. Social-ecological research, takes into consideration social and ecological. Ecosystem studies by human activities.

2. Do tropical forests face region specific threats?

Tropical forest are based on rainfall grading, more types of tropical forests than temperate and boreal. Dry forests, moist, wet forest and rainforests. Specific threats: more population in some tropical forests, rainforests is too wet to maintain populations, lots of mildew, do not like those ecosystems. Moist and dry forests get less rain and it evaporates, and those are the climates where people concentrate. People are in close proximity to moist and dry forests. Economic situation in tropical forests are worse than temperate and boreal. Tropics are mild so there is more human, more dependency on ecosystems. Fuel wood is driver. Cut forest for land and agriculture. Urbanization is not big in the tropics because they are agricultural.

3. What are the usual driving forces behind deforestation in the Caribbean?

Greening of the Caribbean and that's because of people moving to the cities and decrease of deforestation and dependence on forests. Idea is soil rotation is happening, but the problem is that as the population increases the size of the farms decrease, so there is not enough land for shift cultivation. There is an overall degradation of soil fertility; farmers are not being rewarded so there is also a migration in response. The city is more attractive with higher paying jobs, people work until they

4. Generally speaking, how is success defined in forest conservation projects?

Conservation is the same thing as management. Professional foresters consider themselves as practitioners. Lack of knowledge contributes to problems. Learning from failures, allows for corrective actions. Adaptive approach is required for good

conservation projects. You're only unsuccessful when you fail to learn, abandon efforts. Approach, long-term commitments and monitoring leads to successful.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

Whatever solutions you propose have to be based on scientific evidence. Succession is fast in the tropical regions; the weeds that come in will accelerate landslides towards forests. First base initial plan on established science and observation in absence of science. Then do treatment and monitor and adapt. For conservation projects, end is when funding ends. There's an enormous need for technical knowledge and expertise in tropics.

6. Are there particular stakeholders that should be involved in the development of a conservation plan?

International organizations are funding sources, but have agendas when they come in. scientific community, local community. As many people as involved in projects, local scientists, and regulatory agencies. When you have a diverse group you are more likely to understand and find solutions because you have more points of view.

7. What role, if any, do local communities play in implementation of conservation plan?
Many times the local communities have observations that could be beneficial. Local people have ingenious ways to solve problems, planting in a schedule.

8. Are particular land management strategies more successful than others?

Nature is no longer cyclical, because nature is adapting, evolution is accelerating, ecosystems are changing, and everything is changing. If you want to stop that, then you have change/fight nature and takes time and money. The best approach is to see where nature is going, whatever is consistent with your objective.

9. Can conservation have a positive economic impact on tropical regions?

As the forces of urbanization increase, deforestation decreases. Urbanization is important because it drew people from the countryside and the forests grow back after that abandonment, which has not occurred yet in the tropics. There's still an exploitation phase.

10. What is the average project duration?

11. In your view, what is the biggest factor that contributes to success of conservation projects?

Align objectives with natural systems and what you're doing is shifting it but not changing it majorly. Revise your objectives to match nature.

12. In your view, what is the biggest challenge with conservation projects?

Fighting nature is one of the biggest hurdles. A lot of conservation is normative, its imposing values on nature, which are not necessarily in, line with objectives of conservation.

Questionnaire Responses – Dominican Republic & Haiti, Participant #6

1. In your experience, what role do forests play in agriculture-based communities?

Trees, not forest per se, are considered useful if they are a source of fuel (firewood or charcoal), fruit or timber. In Haiti medicinal plants play an important role, since traditional medicines are rarely available in rural areas. Forest is probably perceived as a barrier for agricultural expansion.

2. Do tropical forests face region specific threats in comparison to other forest types (boreal, temperate)?

Yes, boreal and temperate forests are harvested on a regular basis in a more or less sustainable way. Tropical forest is clear-cut, not managed as a renewable resource. In Hispaniola energy production is a very specific threat.

3. What are the usual driving forces behind deforestation?

Poverty imposed protected areas with no effective management, insecure land tenure, population growth, internal migrations, and corruption.

4. Generally speaking, how is success defined in conservation of natural/protected areas?

Usually managers look at deforestation rates, forest restoration, number of patrols conducted by park rangers, etc.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

6. Are there specific stakeholders that are always involved in the development of a conservation plan?

In Hispaniola rural communities are not considered stakeholders but a threat to protected areas and, as a result, they are only involved in conservation plans in the few cases where those communities are organized or supported by a local NGO. Government representatives from different agencies and international agencies or NGOs - when they provide funding for specific projects - play a disproportionate role in developing these plans.

7. What role, if any, do local communities play in implementation of conservation plan?

Very limited role, if any. Local communities tend to play a greater role when there are local NGO's supporting them.

8. Are particular land management strategies more successful than others?

Yes, a combination of paying farmers to protect the land with land acquisition. Also involving local communities in income generating activities, such as ecotourism or handcraft production; however I don't know of any protected area in Hispaniola where all these strategies are being implemented simultaneously.

9. Does conservation have a positive economic impact in the region?

Yes, but is very marginal; for example, the Dominican Republic receives millions of tourists per year, but most of them end up in resorts or coastal communities with beach access; ecotourism is not well developed because protected areas do not provide services to visitors. In Haiti the lack of conservation does have a dire economic impact.

10. What is the average duration of a conservation project?

Two to three years at most, that's why they can't be successful in any measurable way.

11. In your view, what is the biggest factor that contributes to success of conservation projects?

Community involvement at all stages, from inception to completion; a minimum of 5 to 10 years investment and follow-up. Strong leadership of a local NGO.

12. In your view, what is the biggest challenge with conservation projects?

Lack of sustainable funding, corruption, weak community involvement, inadequate training and supervision.

Questionnaire Responses – Dominican Republic, Participant #7

1. In your experience, what role do forests play in agriculture-based communities?

Research has documented ecosystem value throughout Central America. There will be some place for protected areas in forests – land sharing and land sparing, whether we can enhance value of biodiversity systems similar to forest natural systems has to be a key biodiversity strategy. More organizations are adjusting approach to working with human component, how human survival ties into healthy functioning ecosystems. Positive side, coffee shade systems with interspecies can support super high rates of biodiversity in a symbiotic way.

Intensification – other side of the Dominican Republic in costanza with a lot of greenhouses a lot of horticulture. In the valleys that's where the sugar cane, banana production, and cocoa plants. High intensification. Watershed regions need to be addressed in supporting more ecologically friendly coffee shading systems – intensified squash/cattle as a deforestation mitigation strategy.

Long history of root cropping by government in Dominican Republic.

2. Do tropical forests face region specific threats in comparison to other forest types (boreal, temperate)?

Because the soils are acidic and thin, when the forest is degraded the farmers cut them down to grow cops they get a couple years of good yield and then have to move on to clearing other land resulting in negative feedback loop.

3. What are the usual driving forces behind deforestation?

Driven by poverty and things that force them to deforest, illiteracy

4. Generally speaking, how is success defined in conservation of natural/protected areas?

Resources are managed sustainably enough to provide livelihoods and to preserve biodiversity. Sustain agriculture production within the same landscape.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

Participatory Action Research where there is a feedback loop and derive an economic benefit. Make sure you have right groups involved. Ensure what you are doing is ensuring a decision that leads to benefit for local communities and that info is brought to higher level – decision makers.

6. Are there specific stakeholders that are always involved in the development of a conservation plan?

Have a multi-stakeholder group where your feeding input into decision-making process. World bank a lot work there. Government institutions, developmental agencies, local communities.

7. What role, if any, do local communities play in implementation of conservation plan?

Farmers recognize there are tradeoffs in their farming systems but their ability to maintain. Producers know the right way where biodiversity is protected but the reality is that they need money. High rates of food insecurity. Food insecurity in coffee communities – coffee sector financing poverty. Because the reality is the amount of money received is just not enough.

8. Are particular land management strategies more successful than others?

Governmental Role requires a public health point of view in terms of water quality and natural resource management to get a buy in. payment system for watershed systems – easier to calculate.

9. Does conservation have a positive economic impact in the region?

Farmers are poor and living in a near state of abject poverty because of low commodity prices for coffee and lack of high value markets, do have diversified livelihoods (income sources). Shift to different types of plants, which make them more money, impacting ecology, water quality and quantity

10. What is the average duration of a conservation project?

Multi-years, 3-5 years. If you are shooting for regulatory reform, it takes forever. Just need time, realize a lot of it is building capacity of very poor and vulnerable communities. Climate change is throwing issues into the mix, build resilience into communities, and diversify income sources.

11. In your view, what is the biggest factor that contributes to success of conservation projects?

Long-term funding and support, interdisciplinary, address ecological and social drivers, education of locals and address poverty. Focus on root drivers. Impact oriented – contextualize into examples to root in practical items like case studies, to show what you mean by promotion of agroforestry. Contributing to reducing pressure of forests.

12. In your view, what is the biggest challenge with conservation projects?

In highly specialized sector you cannot hand a farmer instructions on production and have him read it. Producers' ability to learn and adopt and respond accordingly has to be addressed through education. Haitian labor.

Questionnaire Responses: Haiti, Participant #8

1. In your experience, what role do forests play in agriculture-based communities?

Depending on the geographical location, forests can be a crucial part of agriculture-based communities, especially those that engage in silvaculture (using products of the forest). Forests offer direct resources such as building materials, gathering of fruits and nuts, and in some places hunting, but they also offer more indirect benefits such as water retention, and shade for growing other crops such as coffee.

2. Do tropical forests face region specific threats that other types of forests (boreal, or temperate) do not?

I would say that tropical forests are especially vulnerable to climate change effects, because of the large fluctuations in rainfall and drought patterns that have been affecting regions such as the Caribbean. There are of course also threats in other regions from the extraction of tropical hardwoods, and the clearing of forests for agriculture or mining, e.g. in Brazil, or Borneo.

3. What are the usual driving forces behind deforestation?

There has been large-scale deforestation of parts of Haiti in the past by logging operations both in the early colonial period, and after independence. There was also clearance of land for agricultural use (sugar in the valleys, and coffee in the highlands). In more recent years there has been widespread use of remaining forests for charcoal production, and this is the primary economic pressure leading to deforestation today.

4. Generally speaking, how is success defined in conservation of natural/protected areas?

It would be in terms of some kind of balance between human land-use pressures and sustainability of natural ecosystems.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

6. Are there stakeholders that are always involved in the development of a conservation plan?

Haiti has a Ministry of the Environment that is generally involved in developing such plans, but there are also many international organizations that may be involved, especially e.g. the United Nations Environment Program, but also smaller organizations such as CODEP.

7. What role, if any, do local communities play in implementation of conservation plan?

Local communities are essential to successful implementation of conservation plans. Without local community involvement and commitment there is no way to ensure the protection of conservation areas. Reforestation that benefits local communities has been one of the most successful models of conservation in Haiti.

8. Are particular land management strategies more successful than others?

Using community-run partnerships to develop grassroots leadership and community organization that is invested in supporting reforestation projects that benefit the community.

9. Does conservation have a positive economic impact in the region?

Yes, grants and loans, technical support, and much more, which has a very significant economic impact in the communities involved.

10. What is the average project duration?

It seems that long-term involvement is needed for real success.

11. In your view, what is the biggest factor that contributes to success of conservation projects?

Cultivating local leadership, building trust, engaging local communities in all aspects of decision-making and management that can thrive over the long term.

12. In your view, what is the biggest challenge with conservation projects?

A big challenge for conservation projects is keeping them going without outside dependence or just one leader. True sustainability means that a place can be self-sustaining, even if there is turnover in personnel involved, and outside assistance should be aimed at support, solidarity, and fundraising, while day-to-day management should be in local hands.

Questionnaire Responses – Dominican Republic, Participant #9

1. In your experience, what role do forests play in agriculture-based communities?

In general, I think this is less in Dominican Republic than in other countries (like Central America and South America). The lines between conservation and agriculture are fairly clearly drawn and this is particularly true with the evictions of small communities from conservation areas in the Dominican Republic.

2. Do tropical forests face region specific threats in comparison to other forest types (boreal, temperate)?

The health of mangroves and with invasive species, particularly those planted as part of disaster recovery efforts (namely bamboo).

3. What are the usual driving forces behind deforestation?

My view is bad policies: defined as not providing incentives to protect forests.

4. Generally speaking, how is success defined in conservation of natural/protected areas?

I think the question is “defined by whom?” The Dominican Republic has a very educated, very committed NGO community that really understands conservation issues very well. For this group of “conservation professionals”, success is defined as maintenance, expansion, and effective management. For these professionals, the criteria for success, I think, was can you maintain the borders and state of protected areas and can you effectively control the management plan (if either the protected area system is growing smaller or if it is being taken away from the professionals, then they are wary). For the Environmental Ministry, existence was success: Effective management may have been desired, but was not a priority. Indeed, if borders could be maintained but ecotourism operations allowed, that was a success for sure. (Note: the Tourism ministry is much more powerful than the Environmental Ministry.) For other actors besides the conservation professionals and the ministry, success is probably defined in other ways.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

My argument is networks inform this. Depending on whether the protected area is managed by the professionals (Grupo Jaragua, for example) or by the ministry, you will get different parameters of the projects. But once again, this is probably a multi-causal story that changes overtime.

6. Are there specific stakeholders that are always involved in the development of a conservation plan?

The professionals are always involved, and if they have good connections to the local communities than those are involved. In recent years, I suspect that the Tourist industry is more involved as a stakeholder, particularly at the highest level. The question is whether this is being channeled through the ecotourism groups (Grupo Puntacana) or whether the resorts are lobbying on their own behalf. I do not know which is happening.

7. What role, if any, do local communities play in implementation of conservation plan?

Once again, this is entirely dependent on whether the NGOs of the professionals have connections with the local communities or not. I think there have been some great efforts in the Dominican Republic of NGOs making sure that local communities play an active role. In many other instances of local communities playing no role. And of course historically, the conservation ignored and were a tool of oppression of local communities.

8. Are particular land management strategies more successful than others?

9. Does conservation have a positive economic impact in the region?

It certainly has economic impacts, but this is probably has positive and negative aspects. What I would say is that conservation changes the transition costs of different actors within domestic society. The establishment of a large conservation system, like in the Dominican Republic, makes transition to other arrangements a costly process. This probably helps some economic activities (notably certain types of ecotourism) and hinders others.

10. What is the average duration of a conservation project?

It did seem that conservation projects in the Dominican Republic appeared less “cycle-based” projects which would see support while there was funding and then largely fold. Dominican Republic seemed to have fewer of these than in other Latin American countries I’ve explored, but this is just an impression and study might show that this is not the case (or not statistically significant).

11. In your view, what is the biggest factor that contributes to success of conservation projects?

The rules in use (this is Ostrom’s concept and I agree with it, broadly).

12. In your view, what is the biggest challenge with conservation projects?

I think there are many influences that can cause the rules in use to be ineffective. My own research focuses on how international influences impact the rules in use of local and national policymakers. If I had to say what is the biggest challenge, I would say: Money and prioritization. The problem as I see it right now is that there isn’t enough funding for conservation internationally and it is spent poorly. I think the best thing that would help conservation around the world would be more funding from the U.S., well managed through conservation experts (not just the big 3 conservation NGOs- WWF, TNC, CI), and ensuring improved livelihoods and dignity of neighboring communities. It

is hard, but I'd say right now we have far too little funding, poorly managed, and without a clear and coherent focus on communities within and around conservation.

Questionnaire Responses – Haiti, Participant #10

1. In your experience, what role do forests play in agriculture-based communities?

They're extremely important as rural communities are home to many people. Agriculture is the primary economic driver so rural communities exist wherever they can fit! These clearings are only enough for the planted land, and they leave as much lush forest around as possible, because they understand that lack of trees is bad for runoff. They preserve as much as possible and only clear land where necessary, although I know so much is missing because they cut trees for firewood constantly.

2. Do tropical forests face region specific threats in comparison to other forest types (boreal, temperate)?

Not in my experience. The mountainous topography and heavy runoff, coupled with deforestation practices for the use of wood are truly the culprits.

3. What are the usual driving forces behind deforestation?

The need for wood to cook. Making charcoal is the main activity I saw there.

4. Generally speaking, how is success defined in conservation of natural/protected areas?

There is no real precedent that I know of. There are preserved spaces, but in terms of encroaching development on these spaces, they don't yet know what it's like to have to fight for undeveloped space. Most of these areas that seem desirable for agricultural tourism or artistic tourism in rural areas haven't been developed and properly

advertised as such to the outside world. It's usually small groups of visitors, not large self-led groups of individuals and development teams. Getting ahead of what may one day be a heavily trafficked tourist destination, with a list of sustainable practices and issues to be addressed ahead of time as opposed to retroactively. If we plan with some foresight, we can avoid some of the major issues that come with new tourism in undeveloped areas. Bassin Bleu waterfall in Jacmel is a good example, where locals are stewards of the land and lead the groups through the difficult to navigate forest, but this is not focused on preservation of the land itself. I see water bottles in the beautiful blue water and know that this is a sacred space that can one day be compromised by larger groups of visitors. This will certainly make it more difficult to manage land preservation and littering prevention.

5. What informs the establishment of parameters (framework, goals, reporting, management) of projects?

Do we have the money? Do we have the government backing to support this? Is the community on board? Who's in charge of communication with the government to make sure all communications are clear?

6. Are there stakeholders that are always involved in the development of a conservation plan?

Every community has that point person who's "IN" and knows the system. This person is usually the communication liaison. As in the case with communities all over the world, no one wants to step up to the plate as not to waste their time, so the people allow whoever wants to be that representative to do that job.

7. What role, if any, do local communities play in implementation of conservation plan?

They just make sure their voice is heard somehow, but my goal with this project was to assume that position. It has been very difficult as the recent hurricanes have moved communications in a more urgent direction as opposed to other development projects, which may seem secondary. The local community appoints who WANTS the job to follow up on issues. These people accept the conditions they're given. Very few have the energy to focus on political gains in a place where they know nothing will be done without an argument being made for regional economic growth.

8. Are particular land management strategies more successful than others?

In my experience, land isn't touched unless they get the government's blessing. There has to be directly, feasible economic growth to impact the immediate future, or no development at all.

9. Does conservation have a positive economic impact in the region?

There are no known conservation areas that are officially declared as such in the Jacmel area. There's a mutual respect in communities to not compromise the overall health of the ecosystem, but this respect can't be expected to translate to all tourists that enter these spaces without the law backing this "proper behavior."

10. What is the average duration of a conservation project?

11. In your view, what is the biggest factor that contributes to success of conservation projects?

Projects here are implemented quickly and can last as long as the government agrees to maintain. Like I said previously, an argument needs to be made for long term investment of any kind. That's the challenge. Convincing an entity WHY they need to have continued investment in anything for any reason.

12. In your view, what is the biggest challenge with conservation projects?

Making this argument for WHY something needs to be done. How is that WHY directly related to saved dollars or investment in their community that they can't do without?

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Biography

Monica Kanojia graduated from Yorktown High School, Arlington, Virginia, in 2005. She received her Bachelor of Science in Biology from George Mason University in 2010. Monica's career has spanned the energy and environmental spectrum with experience engaging with a variety of stakeholders working to meet sustainability goals. Her expertise covers a broad spectrum including research, strategic engagement, communications and marketing strategy, and project management. She recognized the importance of developing solutions that can lessen the impacts of climate change as an undergrad and has dedicated her career to working with organizations that work with the private and public sector to improve the efficiency of technology, reduce energy consumption, and support environmental health. Monica received her Master of Arts in Energy and Sustainability from George Mason University in 2017.