The Forest and the Trees

Evolution of Environmental Forest Policy in Response to Local Needs in Madagascar

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Introduction

From the perspective of a forest, the actions of human beings are schizophrenic at best. Humans came with fire, burning the tangled brush and opening routes beneath the trees; they came with tools, and with dirty hands they opened wounds in the hard pillars that held the canopy; they planted neat rows of crops in the naked land, now inside the forest edge; eventually their minds envisioned new tools, screaming tools that cut like none before, and growling tools that belched smoked as they carried the forest away on their backs and pushed the forest aside under their black rubber feet. Then the humans came with paper, made from the forest, and wrote what their eyes could see; they spoke softly under the shade of the remaining giants and with great care, they handled the small creatures that had lived in the forest since before the fire and tools; they came with young trees and planted them in the dry soil where old trees once stood; they carefully patrolled the forest, telling visitors all that they had learned and instructing those with tools that they must leave. The humans smile on a hazy day, thinking about all that has been accomplished; the forest has been restored to what they believe is its original extent.

Though conjecture, the passage above reflects the essential components of the relationship between human beings and forests. Wood resources and land for crops drove people, the world over, to modify and destroy forests with better and better efficiency. An entire industry, logging, has been built around removing forest trees; in many nations, citizens take advantage of logging operations in order to obtain farmland to feed themselves. In other places, modification and farming of forests has been practiced for many years and is deeply rooted in the local culture.

Regardless of the immediate causes, deforestation ultimately leads to degradation of land quality and loss of species diversity. Thus, forests have become a target of protection, as well as exploitation. The reality of protecting forests, unfortunately, is more complicated than lighting a brushfire or wielding a chainsaw. Local inhabitants of forest land—those most closely tied to the local environment—are as seriously affected by land conservation decisions as the land itself. The presence of local communities, therefore demands that attention be paid to not only the forest, but also to the needs of people. By its own practices, a local community may threaten a forest, yet such people are also the best hope for forest protection. This uncertain territory of "people and places" is where forest protection begins, and where environmental policy meets environmental problems.

In Madagascar, where communities use fire to make forest land suitable for agriculture, policymakers are finding that forest preservation and local practices can coexist. Due to the rift in cultures and practices among government professionals, environmental policymakers, and tribal peoples, key portions of a sound conservation plan may be overlooked. Often, the channel of funds, resources, and professionals operates from without, information filtering down to the terminal tribal node. Such patterns put policy effectiveness at risk, for they fail to capture the input and approval of those who must exist within a protection site. The most daunting task in conservation is crafting policy that is agreeable to all involved parties, and successfully accomplishes the overall goal of protecting people and places. The best ideas, drafted within the confines of an office, often fail to produce desired results when attempted in real-life settings.

Creating successful forest policy hinges on the extent to which local input is sought and the degree to which local people can identify with the project aims.

Down A Path of Broken Trees

It is difficult to determine exactly when the destruction of earth's forests became a trend of global significance. Scholars believe that deforestation affected civilizations as early as 6000 B.C., causing the collapse of communities in modern-day Israel and Jordan (Grove 17). The Sumerian epic Gilgamesh, produced in 2700 B.C., describes the elimination of a vast cedar forest in what is presently the nation of Iraq. Gilgamesh receives divine retribution for this act in the form of fire, which many have interpreted to be drought; by 2100, the "earth turned white," forcing the Sumerians to move north (Perlin 39). The first truly global empire, Great Britain, played a large role in the deforestation of the time by stripping the island of Barbados of its forests for the purpose of establishing sugar crops (Stone 52). The eastern half of North Carolina once was thick with forest land, but was quickly deforested to support the construction of naval ships (Stone 52). A century later, when asked for striking impressions of the Russian countryside by Czar Nicholas I, British geologist Roderick Murchison voiced his concern about "the speed with which forests [were] being destroyed…" (Costlow).

Since the start of the 20th century, the rate of destruction of earth's forests has dramatically increased. Made possible by technological advancements, deforestation has occurred more swiftly in developing nations seeking to generate exports and increase investment from industrialized foreign sources. Southeast Asia, for example, supplies the Japanese with 45% of the world's tropical hardwood (Stone 53). In addition to wood

markets, which are an obvious cause of deforestation, many international development agencies also aided in forest destruction. The Inter-American Development Bank, though currently encouraging sustainable environmental initiatives, once encouraged the construction of dams and growth of agribusiness in post-WWII Latin America (Stone 53). No where is deforestation a greater problem than in the belt of forests straddling the Equator. In the period 1980-1990, forest loss in these tropical regions averaged 170,000 km^2—an area roughly equivalent to 1% of the planet's surface—per year (Tropical rain forest).

In most developing nations, forest loss is caused by a combination of factors that cut across economic and social lines. As mentioned earlier, some deforestation can be linked to the global demand for timber. As wood companies move through the forest, they are followed by a larger problem—conversion of cut forests for agricultural purposes. Geist and Lambin, using global statistical analysis, report that 96% of all deforestation causes are in some way related to the expansion of agriculture, for subsistence, commercial, or ranching purposes. The expansion of subsistence farming is a full three times more frequent than commercial farming (Geist and Lambin). This statistic may not be surprising, considering 30 to 60 percent of urban populations in developing nations live in substandard shanty-towns, on the periphery of cities (Seitz 35). Many, whether of their own accord or as a result of government encouragement, will attempt to move into the forests and feed themselves off the land after the cutting crews have cleared the choice timber. Slash-and-burn transformation of the forest ensues, resulting in cropland or land for raising cattle; while occurring in Africa and Asia, these practices are tremendously pronounced in Latin America (Geist and Lambin).

The consequences of global deforestation are many and affect both local areas and potentially the entire planet. It is a certainty that local cutting and clearing of forests, regardless of biome, results in habitat loss for the forest species. Even when efforts are made to reforest the harvested sites, several factors prevent the land from being as adequate for species as it once was. First, a forest—especially a tropical rain forest—is a complex ecosystem that evolved over thousands of years. Deforestation over a large enough area unbalances this ecosystem by removing canopy shade. This can significantly change the chemical and physical properties of the soil, thereby changing the entire system. Reforestation efforts may fail if newly planted trees cannot obtain the nutrients and moisture that they require. This problem is especially pronounced in tropical rainforests, where the soil is poor in nutrient content and plants must obtain nutrients directly from decaying matter on the forest floor (Seitz 181). In temperate regions, reforestation tends to be more successful in creating an appropriate canopy cover, yet other problems remain. Some species, such as the spotted owl, require the presence of "ancient," or old growth, forests as a part of its habitat. Old growth forests are areas of forested land that are considered to be ecologically mature and free of disturbance for a period of time that varies with biome, but tends to be measured in centuries (Franklin, J.F.). The U.S. Forest Service, faced with the owl's extinction, shifted its policy from the protection of wilderness to the protection of old-growth forest (Salka).

On a planetary level, deforestation has been linked to global climate change. The constant release of carbon dioxide, a greenhouse gas, by industrial processes and automobile use has the potential to trap heat from the sun and thus warming the planet

("Greenhouse…"). Plants, especially trees, metabolize massive amounts of carbon dioxide in during photosynthesis. It is estimated that annually one hectare of rainforest can remove 200 tons of the greenhouse gas from our planet, equivalent to the amount of carbon dioxide released by combusting 1367 standard full tanks of gasoline ("…emissions").

While the topic of deforestation has been on the official agenda of the United Nations since 1972, it was not until two decades later at the Earth Summit in Rio de Janeiro that the "first global consensus on forests" was drafted ("Forest…"). In this non-legally binding document, 172 governments agreed to make and effort to conserve and replant forests ("Earth Summit"). The document also spells out that each nation has a sovereign right to use its forest in a manner befitting its own needs ("Earth Summit"). This additional reference may help explain why the Brazilian hosts of the 1992 Earth Summit continue to deforest an area equivalent to twice the size of Washington D.C. every day (Schwartzman).

Efforts aimed at preventing deforestation worldwide are strongly supported, but remain problematic. While nations of the developed world tend to have controlled their deforestation rates, their environmental rhetoric is interpreted by developing nations as hypocritical (Seitz 179 / Stone 54). England, the United States, and others, having utilized their forest resources and prospered as a result, are now expected to be taken seriously by nations who had yet to join the global "other half."

Solutions to the deforestation problem have the triple task of protecting forest land, engaging the local citizens in policy decisions, and finding ways by which locals can financially benefit from the forest's preservation. Though daunting and intricate,

there is promise. The first hopeful solution is the practice of "eco-tourism." This special kind of tourism promotes to protection of land by making it the tourist attraction. Costa Rica, one of the most biologically diverse nations in the world, employed this strategy of protecting rainforest in national parks and reserves; by 1993, ecotourism replaced bananas and coffee as the country's largest source of foreign exchange earnings (Chase et. al.).

A second solution, relying on limited use of the forest land, are the production of ecologically sound food. So-called "green" food, such as shade-grown coffee, is appealing to environmentally conscious consumers in affluent nations. The coffee plant, which can be grown on a plantation where a forest once stood, also grows in shade, under the canopy of the rainforest. The technique to this sustainable form of agriculture is fairly simple—the understory vegetation in a rainforest is cleared and replaced with coffee plants; when coffee prices are low due to market fluctuations, the plantation is left unweeded, thereby encouraging ground-level diversity as well (Perfecto et. al.). This practice, in theory, benefits the small local farmers, the forest, and the consumers of the coffee.

Finally, forest land may serve as the breeding ground of medically important compounds, thus far unknown to Western medicine. Plants have been the basis for medicines from the dawn of civilization, and continue to be today. Local medical information from native peoples in the Amazonian rainforest is potentially of high value to pharmaceutical companies, which would theoretically share profits with the local peoples who aided in the process. This would encourage the protection, and further biological study, of the forest regions in many nations for years to come.

Regardless of the method or methods used in forest protection, the cornerstone to preserving forest lands is the planning process. Since many groups of people are affected by the forest, measures aimed at its preservation tend to have many critics and contributors. At the core of the various arguments lie the a group of people who are faced with the difficult task of blending science, politics, economics, local needs, national or international wants, cultural sensitivity, and other factors that may be less apparent. These people are policymakers.

Parks, Protected Areas, and Policy

The common understanding of environmental policy is murky at best. Policy can be used for all levels of need, from community to international. Its framers may have backgrounds in economics, science, politics, law, or other fields; many policymakers have experience with more than one discipline. Intentions behind policy, though theoretically reactionary to environmental problems, can be extended to social, cultural, and economic issues. Policy may be changed, twisted, challenged, and compromised by individuals or groups with agendas separate from those of the policymakers. Herein lies the very complicated profession of environmental policy and its trappings. Ideally, sound environmental policy should be designed to maximize benefits to both society and the environment by finding the optimal level of environmental quality ("Glossary"). Debate continually rages over what "optimal" means in a practical sense. This debate it largely the result of limitations in our current understanding of the physical and biological relationships in the environment and the difficult nature of weighing costs and benefits in environmental terms ("Glossary").

Despite the relatively recent interest in environmental science and protection, the aims, methods, and scope of environmental policy have evolved dramatically over time. One of the earliest, and most-well known, examples of environmental policy can be found in the creation of Yellowstone, the world's first National Park. The landscape of Yellowstone was unlike any witnessed before, teaming with boiling earth, vast, mountainous forests, and hundreds of natural waterfalls. The passage of the National Parks Act by President Grant in 1872 marked a change in the way Americans, and later the world, perceived the landscape ("National…"). The term "conservation," often applied to coal, iron, and other industrial materials, was now applied to lakes, trees, mountains, and other impressive works of nature ("National…"). The process to protect this landscape, though lengthy due to novelty and limitations in transportation speed, was essentially smooth and unanimous. There were no residents living in the park area who could object to its formation; no livelihoods rested on extraction of Yellowstone's natural resources (Schullery 58). The only organized effort to skirt this land protection from the beginning was on the part of the Northern Pacific Railroad; their attempts were thankfully not successful (Schullery 95).

This policy of protecting lands came to be known as the "Yellowstone Model" and by the 1920s, became the international standard for land and water conservation (Elford). By 1969, the International Union for the Conservation of Nature (IUCN) defined a national park as "...a relatively large area which is not materially altered by human exploitation and occupation, and where the highest competent authority of the country has taken steps to prevent or eliminate exploitation or occupation in the whole area" (McNeely 392). As this model was applied to a diversity of sites throughout the

world, contrasts between environmental policy and field practicality began to arise. In many cases, areas rich in biological diversity were occupied or exploited by humans, especially indigenous peoples (Elford). Occurrences of unjust relocation, such as the removal of the Ik people from their homelands in the Kidepo Valley of Uganda, illustrate that the practice of creating protected areas does not take into account the protection of "biocultural" diversity (Elford/Turnbull 265).

In order to address the needs of local inhabitants and protect areas from environmental degradation, policymakers have realized that a departure from the Yellowstone Model is in order. This shift in protection policy has not discounted the use of national parks, but has grown to include other forms of conservation. Protected areas are viewed now as "core areas," which are usually linked to zones with more flexible use designations (Harmon 149). Such designations include "biosphere reserves", "extractive reserves", "greenways", "protected landscapes," and others—each with its own defining characteristics and prohibitions (Harmon 149). In terms of safeguarding forest land, the IUCN's Category VI: Managed Resource Protected Area seems most appropriate. This designation provides for a "sustainable flow of natural products and services to meet community needs," while also ensuring that the land is "managed to ensure long-term protection and maintenance of biological diversity" ("Protected…").

New perspectives concerning conservation and added emphasis on people, as well as places, are now the standard in environmental policy. In regions where deforestation is threatening biological diversity, flexible land use options make local communities into environmental stewards. Rather than treating people as a source of degradation, locals are perceived as landscape managers who often work in conjunction with their

government or a non-government organization to ensure their land remains productive (Harmon 152). Current policies not only offer realistic hope for forest protection, but also incorporate sustainable economics and cultural tolerance.

Hope for the success of flexible conservation is not without a large doubtful counterpart. The work of policy-making is now incredibly complicated, often requiring the input of a multitude of "stakeholders" whose individual wants come into conflict more often than not. Stakeholders in a debate over forest protection policy tend to be generally represented by the following groups: local people, environmental organizations, logging industry, and government. Without a doubt, one or more of these broad classifications is comprised of many subunits, each with their own list of objectives. If financially inclined, each stakeholder may also have its own policymakers who have compiled scientific, economic, and other data in order to present a case for their client's specific concerns. The duel problems of environmental science—massive, complex ecosystems and resulting error-prone scientific measurement and observation—tends to turn so-called "hard" science into an interpretive exercise (Haglund). Thus, depending on the perspective from which it is being presented, scientific information can be used to produce policies of contradictory approaches; the adage that classifies statistics as the third kind of lie is alive and well in the development of environmental policy.

A second adage, about getting out what is put in, could also easily be applied to policy development. This particularly applies to working with a local group of people, for policy succeeds more fully with the understanding, consent, and participation of locals. Local people are almost always viewed as the "hands" of human-led protection, the end result of careful policy work. As will be discussed in the next section, local

people must also participate in the "head" operations of policy development. To deny them the power over their own lands is to fail before a single word of policy is written.

Successes and Failures of Forest Policy: The Montagne d'Ambre Project, Madagascar

The island nation of Madagascar is one such location on the planet that has been gifted with exceptional amounts of biological diversity. Of the total number of species on the island, 93% of the mammals, 96% of the reptiles, 90% of the flora and nearly all the amphibians are found nowhere else on earth ("Madagascar…"). Despite its ecological richness, Madagascar has suffered through economic poverty, mainly the result of weak post-colonial governance after the departure of the French in 1958. The island's forests have been a source of valuable resources for centuries, leading to various forms of deforestation. Modern efforts to combat the loss of the island's forests include varying shades of the policy spectrum, from national park creation to integrated conservation and development.

Madagascar's environmental woes stem mainly from the country's past use of the forest. *Tavy*, an agricultural practice of many farmers on the island, is the systematic burning of grasslands and woodlands (Kull). This slash-and-burn technique ensures the woodland dominance of the Uapaca bojeri tree, which supplies edible fruit and provides a home for a species of silkworm (Kull). Contrary to the American idea that forest fires are spectacular and destructive, the Malagasy people tend to view fire as a tool that enables them to earn a living or to feed their families (Kull).

Despite the potentially damaging effects of the *tavy* agricultural practice, Gezon and Freed point out that "colonial economic goals probably fueled the destruction of

much of Madagascar's primary forest." Living in a colony of France, the Malagasy people found themselves in a familiar colonial situation in the late 1800s—conversion of many small local industries to serve the mother country's desire for rich colonial natural resources. It is estimated that nearly 70 percent of Madagascar's primary forest was destroyed between 1896 and 1925 (Jarosz 375). The policies put into place in 1896 by Governor-General Joseph-Simon Gallieni insured the separation of the Malagasy farmer from the forest lands by creating a forest reserve system (Jarosz 375). The particularly violent French conquest of central and eastern parts of the island drove many of the native inhabitants into the forests, where the ability to feed a family was dependent on the ability to successfully clear portions of forest land for agriculture (Gezon and Freed).

In the northern regions of Madagascar, deforestation can be attributed to a number of factors. In addition to the controlled burnings, the forest has been degraded by the exploitation of timber by large corporations and local impoverished people as an income-generating commodity (Gezon & Freed). Forest destruction has also come in the form of cyclones, such as Cyclone Camice which felled massive forest tracts in northern Madagascar in 1984 (Tattersall 29).

Conservation efforts to combat deforestation on the island have a long and varied history. Long before the Yellowstone Model was used throughout the world, French colonials sought to establish afforestation tree nurseries in most of the Malagasy forest reserves (Gezon & Freed). Highly valuable species, such as pine, eucalyptus, poplar, and ebony were planted to provide fuel wood, furniture material, and resins (Bergeret 40). About 10 years prior to decolonialization, the French established national parks in the north, such as Le Parc National de la Montagne d'Ambre ("…Topography"). Following

the colonial period, the socialist Malagasy Republic under Admiral Didier Ratsiraka continued the tree-plantings as part of compulsory national service programs ("Madagascar"). These programs came to and end when Rarsiraka finally declared the tree-planting to be a symbol of foreign dominance ("Madagascar").

It was not until 1988 and the end of President Ratsiraka's unfavorable economic policies that Madagascar became eligible to receive aid from the World Bank ("Madagascar"). The Bank helped Madagascar establish a National Environmental Action Plan and secured and initial $26 million for protection of the nation's forests ("Madagascar"). Among other things, the NEAP created an outline for the Mt. d'Ambre Project, an integrated conservation and development project aimed at augmenting the area's forest protection with resource management for local people (Gezon & Freed). The Project's initial funding from the World Bank was surpassed by donations from several NGOs, including the World Wide Fund for Nature (WWF), and from the U.S. Agency for International Development (USAID) (Webster 54).

The area of Mt. d'Ambre has been significant since the colonial era for a variety of reasons. The French first valued this forested mountain as a look-out post because it offered a view over the northern 50 miles of the island, including the valued port of Antsiranana ("…Topography"). In addition to acting as a watershed for Madagascar's northern lands, Mt. d'Ambre also supplied the French colonials with forestry products (…"Topography"). Conservation efforts in the area, both during and after the colonial period, have recognized Mt. d'Ambre as a unique area of plant, animal, and geological diversity (Gezon & Freed).

The degradation of Mt. d'Ambre and its surrounding area is a result of agriculture, hunting, logging, and charcoal production. The western and interior lands of Mt. d'Ambre experience the least amount of deforestation due to the lack of road accessibility (Gezon & Freed). On the eastern side of the forest, where a national road allows access, one can find pineapple, mango, and banana plantations in former forested areas (Gezon & Freed). Nearby villages have expanded their agricultural lands into areas cleared by cyclones (Tattersall 29). Cattle disturb undergrowth in the forest, as they also make use of the clearings made by nature's fury. In drier areas of the northwest, trees are routinely felled for the production of charcoal ("Montane…"). The only village to be entirely contained within the Mt. d'Ambre forest is Rousettes, where the population is made up entirely of forestry workers and their families (Gezon & Freed).

The Mt. d'Ambre Project sought to conserve and reforest land by combining education, tourism, agroforestry, and other income-generating professions among local populations. The Malagasy government, attempting a top-down approach, hired local people as *Agents pour la Protection de la Nature* (APNs), whose job it was to police protected areas and generate support for conservation at the local level (Gezon & Freed). The APNs were given salaries, which in theory would eliminate their need to farm in the forest lands (Gezon & Freed). More local people were employed at village tree nurseries, where they could help produce wood for fuel and construction, thus theoretically eliminating the local need for further removal of trees from the Mt. d'Ambre forest (Gezon & Freed).

The effectiveness and success of the Project was periodically evaluated by the Malagasy government, with mixed feedback. When asked in 1991, heads of more than

20% of prominent village households could not state how the agroforestry program had benefited them (Marcus & Kull). Positive local perception faltered as those in other Mt. d'Ambre-area villages began to view hired officials in Rousettes as unfairly privileged (Gezon & Freed). A second Project inspection in 1999 reported that despite a lack of community acceptance and understanding of the programs, many of the community-planted trees had continued to thrive (Gezon & Freed). While residents stated that they liked the fruit trees, many confessed that they had no use for eucalyptus. One man perceived the program as a loose agreement between the government and the people—if allowed to gather forest materials, people were expected to plant replacement trees on their own properties (Marcus and Kull). Tree distribution and plantings seemed to succeed and be received either positively or with neutral response. The Project's deeper goals, engaging local people in conservation and management strategies and providing sustainable income-generation, were apparent failures.

Reasons for the overall failure of Madagascar's Mt. d'Ambre policy are mainly found at the terminal site where people meet policy. Since the roles of sound environmental policy are meeting conservation standards and serving the needs of local individuals, it is realistic to expect the Project to have made significant impacts in both respects. Yet local people were neither consulted nor engaged in the design and implementation of this policy; a handful of agents were merely selected to carry out the aims of policymakers who, despite their concern for local issues, did not allow local decisions to play a role in policy development. In a sense, the Malagasy policymakers were unable to separate the trees from the forest as their conservation aims dictated the community-level actions and not the converse. Local people, having not participated in

the drafting of policy, did not feel the urgency to seek alternative sources of wood, nor did they deem it necessary to replace the wood from the forest region. From a local perspective, the forest was not discernable from the trees.

Implications

Overall, deforestation is a global problem with very local nuances. Though classifiable into broad categories, such as the practice of subsistence farming, each deforestation case is vastly different from another due to a combination of factors. Local economic schemes, cultural traditions and ecosystem structures, as well as current government policies all contribute to the specific challenges that face forest protection in any given area.

As a result of the case-by-case nature of deforestation, prevention and conservation strategies must be tailored to address the specific needs of all involved parties and, of course, the forest. Environmental policy has evolved over time, from the general preservation approach of the Yellowstone Model to diverse categorization of protection strategies that allow conservation flexibility. The program details of modern forest conservation may evolve within a framework of the IUCN's designations. This gives policymakers a vague idea of site usage and protection purposes, yet allows the freedom to integrate local usage needs. In this way, a compromise can theoretically be reached, benefiting both forest ecosystems and those who depend on them for survival.

The role of local participation and locally-minded planning in the development of policy is essential to the success of any conservation program. Local people, despite their possible role in forest degradation, have an equal capacity for forest protection. As a

result of proximity and intimacy with a site, indigenous populations may greatly enrich and assist in carrying out policy. In order to be effective, local forest uses must be understood and incorporated into policy, thus allowing people and places to coexist. Local participation in policy creation, from the bottom-up, ensures that the destiny of a population is partly formed by its members and not entirely by environmental experts and government officials.

Though exemplified through the Mt. d'Ambre case study, the fate of strictly top-down policy formation resounds in locations throughout the world. It is plain to see that human beings are more likely to cooperate with a conservation effort if their own lifestyles are not compromised. This phenomenon is by no means unique to Madagascar; it is most certainly a characteristic of the human race as a whole. Forest conservation efforts, whether undertaken by an international body, such as the United Nations, down to local efforts, such as a non-profit and government partnership, can all benefit from including local ideas and concerns in the decision-making process. The meeting of local interests and environmental concerns emerges as a logical step in conservation. Each "side" of an issue sees the land differently; therefore a merger of their views creates a more complete picture and brings both forest and trees into sharp focus.

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