

Breaking the Resource Curse

*A Case Study of Smallholder Empowerment and Environmental Stewardship
in Chone, Ecuador*

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List of Abbreviations

BCE	Banco Central del Ecuador (<i>Central Bank of Ecuador</i>)
CEPAL	Comisión Económica para América Latina y el Caribe de las Naciones Unidas (<i>see ECLAC</i>)
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
FAO	United Nations Food and Agriculture Organization
ILO	United Nations International Labor Organization
INIAP	Instituto Nacional Autónomo de Investigaciones Agropecuarias (<i>Autonomous National Institute of Agricultural Research</i>)
IMF	International Monetary Fund
ISI	Import Substitution Industrialization
MAGAP	Ministerio de Agricultura, Ganadería, Acuacultura y Pesca (<i>Ecuadorian Ministry of Agriculture, Ranching, Aquaculture, and Fishing</i>)
NGO	Non-Governmental Organization
OPEC	Organization of the Petroleum Exporting Countries
SIA	Sistema de Información Agropecuaria (<i>Ecuadorian Agricultural Information System</i>)
SIGAGRO	Sistema de Información Geográfica y Agropecuaria (<i>Ecuadorian Agricultural and Geographic Information System</i>)

Introduction

As an environmentalist, I arrived in Ecuador in the spring of 2010 with strong opinions regarding the ongoing destruction of many of the most biodiverse ecosystems on the planet that are, and had previously been, located there. In the five months I lived in Ecuador, however, what left the biggest impression was not the natural splendor of the place—which is, to be sure, magnificent—but the beauty and resilience of the people. I witnessed many Ecuadorians suffering from the same forces that cause the ecological devastation that is so visible throughout the country and came to realize what many Ecuadorians know instinctively: that what is best for them is generally the same as what is best for the natural environment in which we all live.¹

This is how what was supposed to be a basic study of deforestation in Coastal Ecuador turned into a senior thesis on the international and domestic economic and political causes of underdevelopment in Ecuador. I traveled to Chone, Manabí Province in April, 2010, to conduct my study, unsure of what I would find since the principle cause of deforestation there is clearing for cattle grazing by individuals. As part of my research, I visited and interviewed farmers throughout the region. During that month I met some of the most hard-working people I will ever meet in my life. Again and again I saw families that had been pressured to clear-cut their land, against their better judgment, by economic forces much larger than anyone could be expected to face. Then I met Glenda Muguerza, Don Freddy García and their family. Against the odds and with no training or outside help, they had found a way to thwart these forces and pursue an alternate

¹ Ecuador became the first country in the world to grant ecosystems their own constitutional rights in 2008. Though this move clearly demonstrates the will of the people regarding environmental protection, other political and economic forces that are the subject of this thesis have thus far prevented this constitutional

livelihood that at once greatly benefits them and the ecosystem upon which they depend. They inspired me to write this thesis.

Many say that countries like Ecuador suffer from a “resource curse.” They are the richest countries in the world in terms of natural wealth and the poorest in the world in terms of economic development.² Countries afflicted with the resource curse also generally experience high rates of environmental destruction, which only serves to further impoverish human populations. As I read the literature regarding the resource curse, I kept coming back to Don Freddy and Glenda. None of the studies I saw ever addressed the problem of the resource curse from the ground up in the grassroots way that they did. In this thesis, I do my best to tell their story within the context of the international and domestic challenges facing Ecuador.

Though I spend a good portion of this thesis contesting the existing political and economic systems that are responsible for these challenges, I focus in the end on understanding how Don Freddy and Glenda were able to build a livelihood for themselves that is socially equitable, economically productive, and environmentally sustainable, despite the realities of this broken system. In doing so, I identify several ways in which more people working from the grassroots as they did could in fact affect a larger change in the system overall and argue that leaders engaging solely in macroeconomic policy battles work against this end. I believe that Don Freddy’s and Glenda’s story can inform the most experienced of economists and politicians in finding solutions both for Ecuador and other countries that share the same plight.

² I will introduce many problems with the term “economic development” in Chapter 2.

Chone, Ecuador as a Case Study

Ecuador possesses uniquely high levels of biodiversity that make it a country of concern for any conservationist.³ Though Ecuador has a land area of approximately 250,000 square kilometers—roughly equal to that of Oregon—it possesses one of the highest levels of biodiversity in the world, both by absolute species count and by species per unit area. The country ranks third in number of vascular plant species per unit area, eleventh in mammals, and fifth or better in every other vertebrate group. However, Ecuador's ecosystems are also among the most threatened in the world. Conservationists worldwide agree that Ecuador is a critical conservation area.⁴

The country's astounding level of biodiversity is the result of a unique geography, climate, and evolutionary history. Continental Ecuador is geographically bisected by the two cordilleras of the Andes mountain range, dividing the country into three distinct regions: the Costa, or western coastal lowlands; the Sierra, or highland Andes; and the Oriente, or lowland Amazon rainforest (Figure 1). The country is also characterized by unique and varied climactic conditions. The interaction of the Humboldt and Panama currents off Ecuador's Pacific coast and air currents coming across the continent from the Atlantic create distinct wet and dry seasons throughout the country.⁵ Due to these drastic differences in altitude and moisture, each of Ecuador's three regions contains a whole

³ Conservationists often argue for the inherent value of biodiversity. In this thesis, however, I will assert the role of biodiversity in the maintenance of local communities of human, plant, and animal life as a whole.

⁴Rodrigo Sierra, Felipe Campos, and Jordan Chamberlin, "Assessing biodiversity conservation priorities: ecosystem risk and representativeness in continental Ecuador," *Landscape and Urban Planning* 59, no. 2 (April 15, 2002): 95-110.

⁵Jefferson Meham, "Causes and Consequences of Deforestation in Ecuador," *Centro de Investigación de los Bosques Tropicales* (2001).

host of ecosystems, each with levels of floral endemism as high as 27 percent.⁶ This checkerboard of habitats has enjoyed a long, uninterrupted evolutionary history characterized by a lack of major disturbances—natural and artificial—until the 20th century. At present, Ecuador is one of the most deforested nations in South America, with only 39.2 percent of the country’s forest cover remaining. Over half of this deforestation occurred in the last 20 years—21.5 percent between 1990 and 2005—and the deforestation rate has only increased since.⁷

Figure 1: The Regions of Mainland Ecuador



Source: Reproduced from TurismoEcuador.com

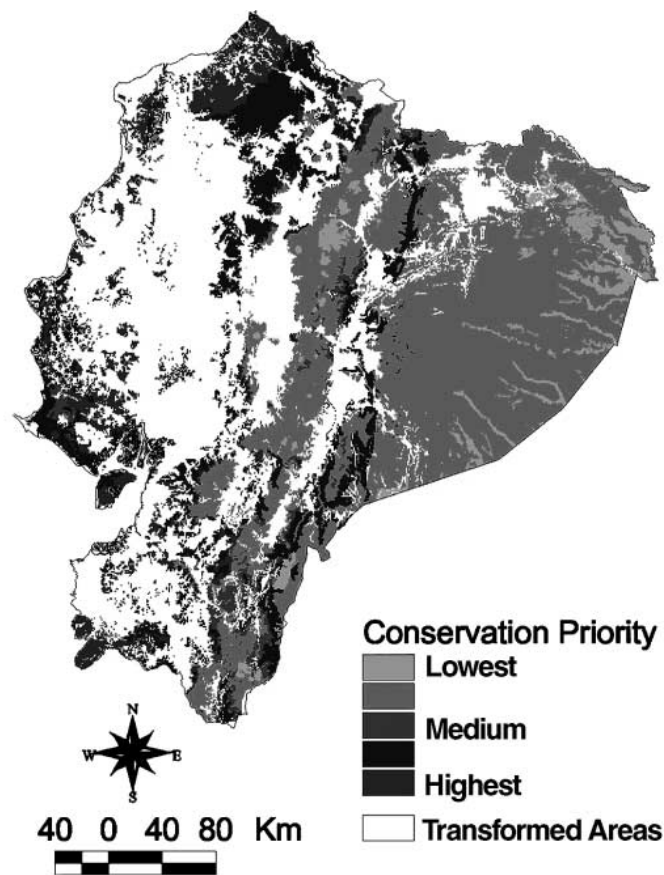
Human activity targeted toward the production and extraction of export commodities is the largest cause of environmental degradation in Ecuador, and it is concentrated on the coast. The coastal region possesses climactic conditions that favor

⁶C. H. Dodson and A. H. Gentry, “Biological Extinction in Western Ecuador,” *Annals of the Missouri Botanical Garden* 78, no. 2 (1991): 273-295.

⁷Mette Løyche Wilkie, “Global Forest Resources Assessment” (2005).

extremely high levels of ecological productivity; many of its ecosystems have some of the highest levels of endemism in the country. However, these conditions are also nearly perfect for agriculture. As a result, the region is responsible for the majority of the country's agricultural productivity, and the coast is far and away the most deforested region in Ecuador.⁸ Cattle grazing and agriculture, which doubled between 1960 and the 1980s, is largely responsible.

Figure 2: Conservation Priorities in Ecuador by Region



Source: Reproduced from Sierra et al. (2002)

⁸ Refer to Appendix A for detailed conservation priorities in Ecuador.

Of the six most critically threatened ecosystems in Ecuador, five are found in the Costa, making it the highest conservation priority in Ecuador in terms of biodiversity (Figure 2). The Oriente also suffers from large-scale degradation with high human costs due to more recent petroleum extraction. The resource-poor Sierra has remained the least ecologically threatened, though still transformed by its historically large human population.⁹

Figure 3: Deforested Farmland in Chone



Source: Photograph by author, April 16, 2010

Chone Canton is located about 45 kilometers from the Pacific coastline in Manabí Province, western Ecuador.¹⁰ It possesses an unusually unstable tropical climate, affected by the changing ocean currents off the coast. There is a strong dry season from June until

⁹Sierra, Campos, and Chamberlin, “Assessing biodiversity conservation priorities.”

¹⁰ Ecuadorian cantons are most similar to counties in the United States.

November and a strong wet season from December until May. Chone is the second-most deforested canton in Manabí, with 87.24 percent of its 311,767-hectare area deforested. It is also the largest grazing canton in Ecuador. Chone contains 198,082 head of cattle, 25.28 percent of the province's total 783,592, and 4.43 percent of the country's total 4,486,020. The canton produces 29.12 percent of Manabí's milk (96,553 liters daily), of which 85 percent comes from small producers.¹¹ The region is therefore an ideal place to study both deforestation and the role of smallholder production.

Methodology

In April, 2010, I traveled to Chone Canton, Manabí Province, Ecuador, and stayed with the García Muguerza family. During the two weeks I lived with them, Don Freddy and Glenda told me each day about the workings of their farm, the Hacienda Santa Cecilia, and their struggle to get to where they are today. Much of the data in this thesis comes from the wealth of information they provided through these daily informal interviews. However, I also conducted interviews with other local farmers and residents and made visits to several government agencies as well as one non-governmental organization (NGO) and one corporation. Some of these interviews were formal and others informal, but all were conducted in Spanish. The interviewees' ages ranged from 19 to 65 years old, with the majority being around 40 years old. Of the nine people whose interviews appear in this thesis, seven were native Choneros and two had migrated

¹¹“Censo Nacional Agropecuario III” (Instituto Nacional de Estadística y Censos and Ministerio de Agricultura y Ganadería, 2000).

from the Sierra region. Five of these interviewees were male and four were female. Nine were mestizo Ecuadorians, and one was of European descent.¹²

My interviews with farmers were formal. I scheduled interviews through the Cooperativa de Producción Agropecuaria Chone Ltda., which is the local agricultural cooperative. During interviews, I asked about levels of production for different crops and livestock per hectare or per individual, number of hectares or individuals, selling price of goods, and costs associated with production. I then asked about any history of environmental disruption to their livelihoods associated with deforestation, and attempted to quantify those costs. If she or he had any reforestation projects under way, I asked to collect information on the number of trees planted per hectare, the number of hectares reforested, method of planting, type of tree planted, and cost of planting. Lastly, I asked whether the farmer had looked into environmental services payments or ecotourism projects as indirect income from these newly forested areas. In the end, I focused on the Hacienda Santa Cecilia because of the availability of data going back many years and because the García Muguerza family's in-depth employment of intercropping and silvopasture during that time presented an opportunity to study the success of these efforts.

When interviewing area residents, I took a more informal approach. I asked questions about the history of Chone and of Manabí, and about their general feeling about deforestation, reforestation, and the government. All of the people I spoke with were

¹² Refer to Appendix C for list of interviewees.

very helpful, and there are many of these informal interviews that I regret I could not fit into this thesis for lack of space.¹³

Before traveling to Chone, I visited the offices of Fundación Natura, an Ecuadorian environmental NGO; the Ministry of Agriculture, Ranching, Aquaculture and Fish (MAGAP); and the Central Bank of Ecuador (BCE). During these visits, I gathered data on commodity imports and exports, macroeconomic indicators of development, and land use throughout Ecuador. Once in Chone, I visited the local office of MAGAP, the local Chonero government's Office of Sustainable Development, the local government's Office of Tourism, and a local dairy collection facility of Industriales Lácteas Toni S.A., an Ecuadorian dairy corporation. These visits allowed me to gather information specific to Chone on the area's history, land use, livestock deaths and community costs, ecotourism efforts, as well as agribusiness presence.¹⁴

Organization

This thesis is divided into three chapters. In Chapter 1, I introduce the Hacienda Santa Cecilia and the challenges it has faced due to the "resource curse." I then present the genealogy of underdevelopment and the resource curse problem as they have developed in Ecuador. In Chapter 2, I outline the ways in which the Ecuadorian state has conceptualized and addressed these problems in the past, and assert that existing approaches have been inadequate. In Chapter 3, I detail the success of the Hacienda Santa Cecilia in combating the fundamental underpinnings of the resource curse. I

¹³ Refer to Appendix C for list of interview questions.

¹⁴ Refer to Appendix C for list of agency visits.

conclude by identifying private, domestic land ownership as the primary factor enabling the success of the Hacienda.

Chapter 1

Behind the Resource Curse: A History of Dependency, Environmental Destruction, and Export Economies in Ecuador

“I call petroleum the devil's excrement. It brings trouble... Look at this locura—waste, corruption, consumption, our public services falling apart. And debt, debt we shall have for years.”

— Juan Pablo Pérez Alfonso
Oil Minister of Venezuela and Co-Founder of OPEC

Ecuador possesses astonishing natural wealth. Not only is it a nation blessed with the highest levels of biodiversity in the world and ideal agricultural conditions, but it also possesses large deposits of oil, copper, and gold. Neoclassical economics dictates that this natural wealth should translate into economic prosperity and development for Ecuador by increasing the production possibilities of its economy. Reality has shown the opposite outcome. Ecuador continues to suffer from one of the highest poverty rates in South America. However, rather than develop a diversified, modern economy, Ecuador continues to export its natural wealth in pursuit of the tantalizing prosperity that has seemed just beyond its reach for over a century. The resulting boom-bust export cycle has been economically devastating for the country's people, while simultaneously saddling them with immense environmental and human health costs.

In Chone, Ecuador, many farmers have only owned their land for a generation. Beginning in 1964, the Ecuadorian government enacted a series of land reform laws that partitioned large landholdings that had previously dominated the country.¹⁵ Many fortunate Choneros found themselves the new owners of small parcels of land. As Carlos

¹⁵Dennis Michael Hanratty, *Ecuador: A Country Study* (Federal Research Division, Library of Congress, 1991).

Álvarez Mosquera expressed to me in an interview, they possessed limited skills and knowledge of farming and land management, and their immediate goal was simply to make a living for themselves and their families. Though many of them may have had ancestors that farmed for generations, years of dominance of the *hacienda* system interrupted the pathways by which such knowledge and skill would normally have been passed down. On their new land, many found that they could not compete in the rapidly globalizing food market with, for example, the cacao produced in Africa, the corn produced in the United States, and the bananas produced on large banana plantations. Based on food market prices and the limitations of food transportation, dairy and meat products were some of the only profitable goods they could sell. The Ecuadorian government passed a law in 1980 to further promote cattle ranching for smallholder farmers. Those who did not initially agree were convinced by the experience of trying to compete with the global market prices of other goods.¹⁶

As cattle ranching was not a traditional economic activity in the region, many farmers did not know how to go about it. Government officials advised farmers to clear-cut their land for open pasture as was typically done in other countries. This practice worked well at first, and farmers were able to make good livings this way. However, as forest cover decreased, the climactic conditions of the region began to work against them. The forest no longer provided the ecological buffer of moisture absorption, and pastureland began to dry up during the strong dry season and flood during the equally powerful wet season. For years, farmers have had to accept high rates of cattle mortality due to these droughts and floods. The land has become so thoroughly exhausted that

¹⁶Carlos Álvarez Mosquera, April 13, 2010.

many believe it cannot be used for anything else anyway.¹⁷ Yet, many have not made the connection between the clear-cutting and their struggle with droughts and floods due to their persistent lack of land management skills and ecological knowledge.

In this chapter, we first become acquainted with Don Freddy García and Glenda Muguerza and their unusually successful farm, the Hacienda Santa Cecilia. In introducing their story from struggle to success, we come across a problematic question. Why is it that they, like so many other Chonero farmers, initially had only a singular course of action: to clear-cut? To answer this question, I turn to the analytical framework provided by what scholars call the “resource curse.” I then outline how this curse has played out throughout Ecuador’s history, focusing on the coercive relationship between resource abundance and human capital. Finally, I incorporate observations about the global economic system and how it cements this coercive relationship, resulting in the resource curse we see today.

Land Use at Hacienda Santa Cecilia

Don Freddy García and Glenda Muguerza are Choneros, through and through. They are jovial, quick-witted, and speak a colorful and rapid Spanish that is nearly incomprehensible to many other Ecuadorians—to say nothing of foreigners. Don Freddy and Glenda make their decisions together, which is rare in Ecuador’s machismo society. They are constantly working, and yet they still somehow come off as incredibly relaxed, fun, and contented with life. They have two happy teenagers: Freddy Barón and Sthefani Sofia. They built their cinderblock house by hand, and it now has cold running water, electricity, and a television. It is always full of people: relatives, neighbors, and friends.

¹⁷Don Freddy García, Interview, April 16, 2010.

There are often several chickens, dogs, and a cat among the crowd as well. The family is very well liked despite their relative wealth, and everyone wants to know how they built this life for themselves.

Figure 4: García Muguerza Family

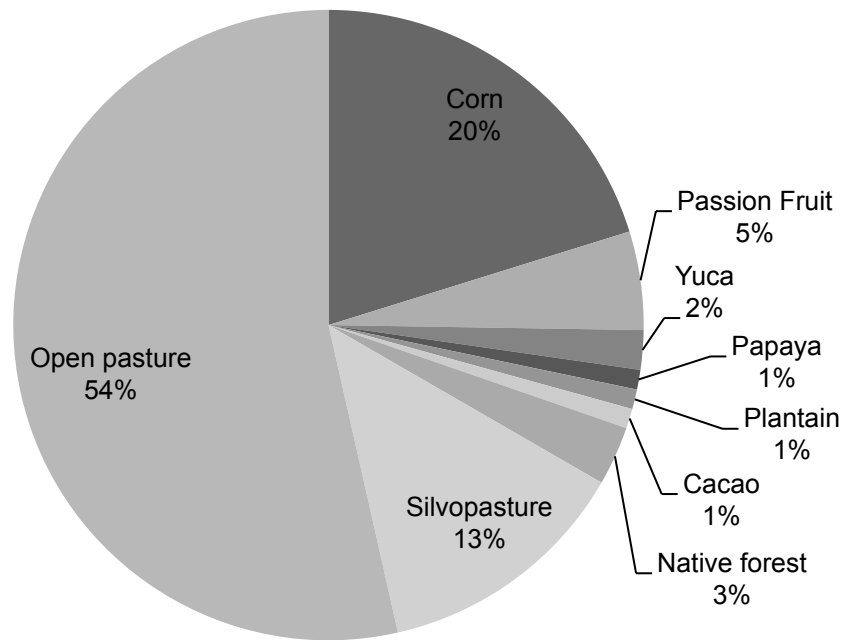


Source: Photograph by Jorge Andrade, April 25, 2010

They call their farm the Hacienda Santa Cecilia, and it is located near the town of San Antonio in Chone Canton, Manabí Province in the Costa region of Ecuador. It is a 300-hectare property, with highly diversified agricultural production (91 hectares), open pasture (159 hectares), a small amount of conserved native forest (10 hectares), and a large silvopasture agroforestry system (40 hectares) that was initiated around the year

2000 (Figure 5; Table 1).¹⁸ Infrastructure at the hacienda includes stables, hog shelters, two water cisterns, a pump system, animal troughs, feed silos, workers' houses, and the main house. There are 10 permanent workers and 10 seasonal workers.¹⁹

Figure 5: Hacienda Santa Cecilia Land Use



Source: Interview with Don Freddy García, April 16, 2010

The Hacienda Santa Cecilia is profitable. It produces small amounts of corn, passion fruit, yucca, papaya, plantains, cacao, milk, and meat, mostly for local consumption and local sale. However, while the vivid papaya trees and vast open pastures are the first things to catch a visitor's eye, it is neither the crops nor the pasture that are responsible for the Hacienda's success. It is the forest.

¹⁸Ibid.

¹⁹"Sistema silvopastoril, experiencia de buena práctica de resiliencia en la cuenca media del río Chone" (UN Food and Agriculture Organization, 2009).

Table 1: Hacienda Santa Cecilia Land Use

Land Use	Hectares	Percentage
Open pasture	159	53%
Silvopasture Forest	40	13%
Native forest	10	3%
Traditional cultivation		
Corn	60	20%
Passion Fruit	15	5%
Yuca	6	2%
Papaya	4	1%
Plantain	3	1%
Cacao	3	1%
Total	300	100%

Source: Interview with Don Freddy García, April 16, 2010

Twenty years ago, the Hacienda was nearly all open pastureland. Don Freddy's father eked out the same meager subsistence as neighbors continue to do to this day by raising cattle and accepting the high costs of their death due to flooding and drought. For years, Don Freddy's father, and then Don Freddy and Glenda, continued in this way with seemingly no other option. It was only once they began to plant trees on a small portion of their land as an experiment ten years ago, reforesting their plot bit by bit, that they started to turn a large profit. To do so ran, and runs, counter to the common knowledge on how to raise cattle and make money with your land. Chapter 3 examines why they chose to do this and why it worked, but the salient question now is this: why were Don Freddy and Glenda along with nearly every other Chonero farmer forced into the grazing business in the first place?

Those whom I interviewed in Chone were the hardest working people I have ever met. They also are not stupid. They would not have destroyed the natural wealth of their

home had they not been convinced that there was no other way. In order to understand the forces that created such conditions, we must look to economics, politics, and history.

The Resource Curse Theory

The paradoxical resource curse is not unique to Ecuador. There is substantial empirical evidence that the richer a country is in resources, the more it suffers from economic underperformance (Figure 6).²⁰ Some economists limit their definition of resource abundance to oil and minerals, while many consider a wider variety of resources including plentiful agricultural produce.²¹ Jeffrey Sachs and Andrew Warner consider a wide variety of resources in their 2001 study, which finds that for each increase of one standard deviation in natural resource abundance, economic growth declines by one percent per year.²² This economic underperformance is also associated with political strife and environmental destruction. Some studies find that the more geographically concentrated resources are within a country, the more likely they are to impede development.²³ All of this is to say that many resource-abundant countries are not poor despite their natural riches; they may be poor because of them. The resource curse trend is well documented, but no consensus exists regarding the means by which resource abundance affects growth. By what mechanisms does resource abundance impede economic growth? Why do resource-abundant countries in the global North fail to

²⁰C. N. Brunnschweiler and E. H. Bulte, "Linking Natural Resources to Slow Growth and More Conflict," *Science* 320, no. 5876 (May 2, 2008): 616-617.

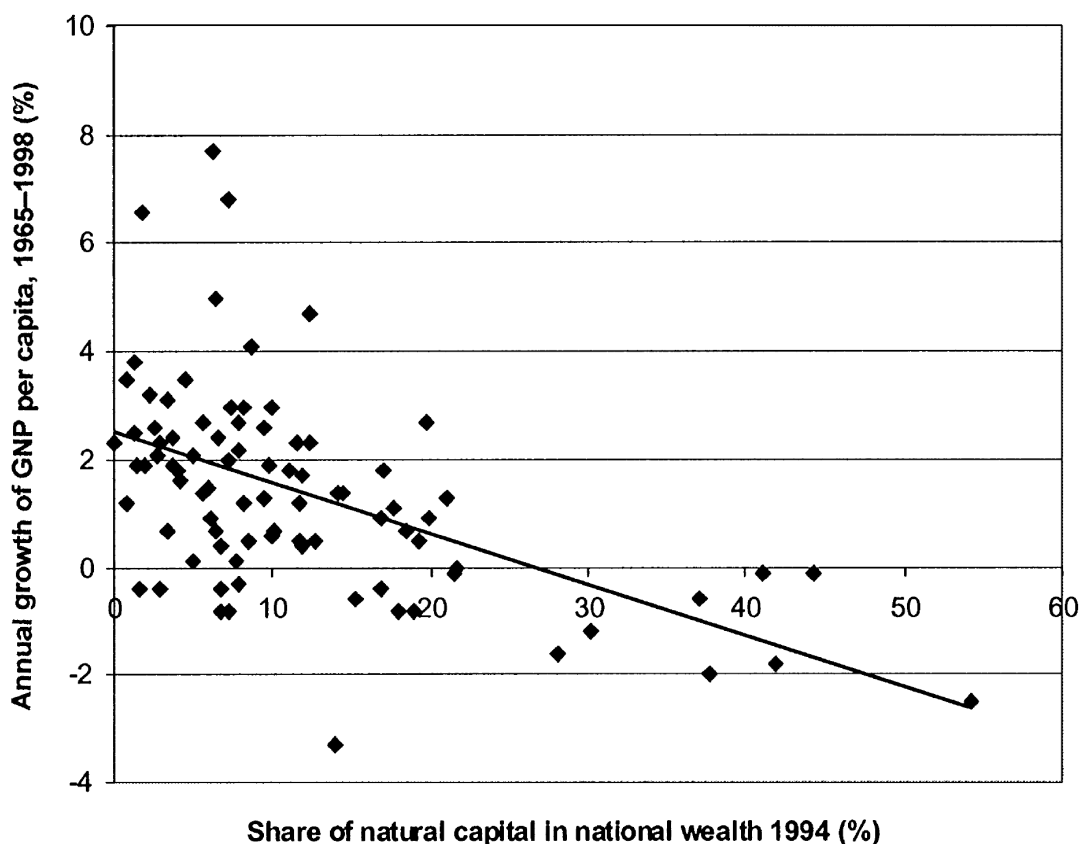
²¹ The main factor I consider is whether the item that is plentiful can be quickly and easily commoditized and exported for profit.

²²"The curse of natural resources," *European Economic Review* 45, no. 4-6 (May 2001): 827-838.

²³Thorvaldur Gylfason, "Natural resources, education, and economic development," *European Economic Review* 45, no. 4-6 (May 2001): 847-859; K. Wick and E. H. Bulte, "Contesting Resources: Rent Seeking, Conflict and the Natural Resource Curse," *Public Choice* 128, no. 3/4 (September 2006): 457-476.

display the resource curse?²⁴ Why do neoclassical economic policies created in the global North with the stated goal of reducing poverty in the global South generally achieve the opposite effect?

Figure 6: Negative Correlation between Resource and Economic Growth



Source: Reproduced from Gylfason (2001)

The Dutch Disease

The first and most common mechanism by which economists commonly believe the resource curse operates is known as the “Dutch” disease. *The Economist* coined this term to describe the Dutch experience following the discovery of natural gas in 1959. It

²⁴ I use the terms “global North” and “global South” in full acknowledgement of the fact that such terms interpreted in a literal sense are geographically inaccurate. Rather, I employ these terms conceptually to distinguish between two groups of countries that have a historical relationship defined by domination. I interrogate this relationship later in this chapter.

describes an economic mechanism by which a valuable export commodity causes the real exchange rate (the exchange rate adjusted for inflation) to appreciate, making other export goods less competitive in the international market. Windfall profits from the booming export shift factors of production (capital and labor) to that sector at the expense of others, with the result that the most valuable commodity quickly dominates the entire export sector.²⁵ The manufacturing sector is particularly susceptible to decline, which decreases the demand for skilled labor.²⁶ The Dutch disease thereby also describes increased income inequality and retarded economic growth due to a lack of investment in human capital.²⁷ Many studies find an inverse correlation between resource abundance and school enrollment as well as between resource abundance and public education expenditures relative to national income.²⁸

Volatility

Commodity markets are highly volatile in nature. World supply and demand can fluctuate quickly and unpredictably for a number of reasons including: war, politics, technological advance, and in the case of mineral commodities, discovery of new reserves. As a result, any economy that relies on a sole export commodity for economic performance will experience high volatility. Ecuador's economy is highly volatile as a result of its export dependence; per capita GDP growth has closely tracked per capita

²⁵“The Dutch Disease,” *The Economist*, November 26, 1977.

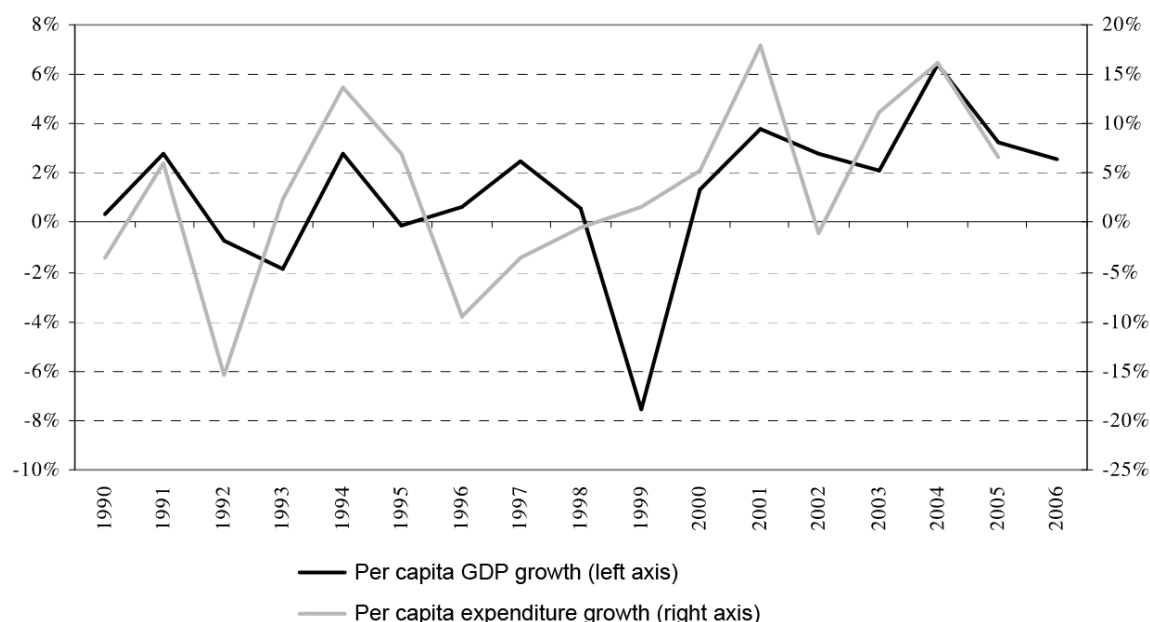
²⁶Jeffrey D. Sachs and Andrew M. Warner, *Natural Resource Abundance and Economic Growth* (National Bureau of Economic Research, Inc, December 1995), <http://ideas.repec.org/p/nbr/nberwo/5398.html>.

²⁷ “Human capital” is a problematic term, which I will define later in this chapter.

²⁸Nancy Birdsall, Thomas Pinckney, and Richard Sabot, “Natural resources, human capital, and growth,” in *Resource abundance and economic development*, by Richard Auty (New York: Oxford University Press, 2001), 57-75; Gylfason, “Natural resources, education, and economic development.”

export growth throughout history to record (Figure 7). Many studies link economic volatility with a lack of sustained growth over time.²⁹

Figure 7: Per Capita Real GDP and Exports Growth in Ecuador, 1928-2006



Source: Reproduced from Cueva et al. (2007). Data from Central Bank of Ecuador.

Rent Seeking and Corruption

Politically, resource abundance also creates incentives for rent seeking and corruption, both of which many economists recognize as harmful to economic growth.³⁰ Concentrated, easily available windfall rents tend to create a feeding frenzy, which Lane and Tornell term the “voracity effect.”³¹ Individuals and government officials become distracted by the short-term gains presented by windfall rents instead of focusing on long-

²⁹Garey Ramey and Valerie A. Ramey, “Cross-Country Evidence on the Link Between Volatility and Growth,” *National Bureau of Economic Research Working Paper Series* No. 4959 (December 1994), <http://www.nber.org/papers/w4959>.

³⁰Paolo Mauro, “Corruption and Growth,” *The Quarterly Journal of Economics* 110, no. 3 (1995): 681-712; C. Leite and J. Weidmann, “Does mother nature corrupt?” (International Monetary Fund, 1999).

³¹Aaron Tornell and Philip R. Lane, “The Voracity Effect,” *The American Economic Review* 89, no. 1 (March 1, 1999): 22-46.

term development. Political corruption and environmental destruction also follow rent-seeking behavior. New leaders are generally more concerned with extracting as much profit for themselves as they are able in their limited time in office than with maintaining the rule of law.³² Similarly, environmental conservation is a long-term concern that is typically ignored by short-term rent seekers.

Unproductive Public Investments

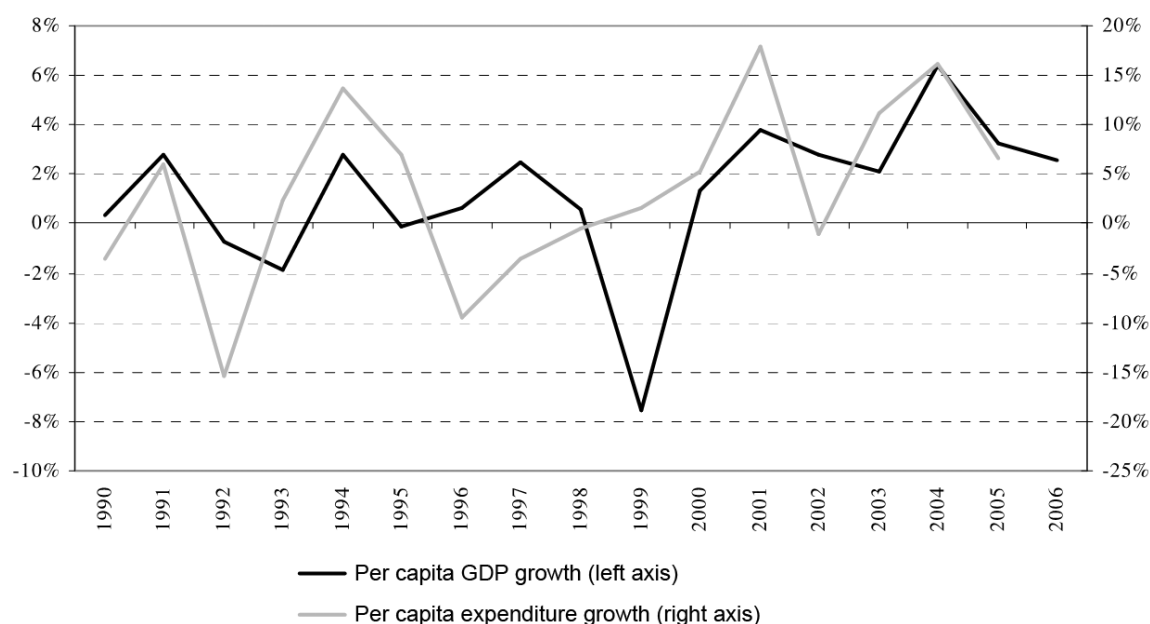
Governments rich in rent revenue during commodity booms will often invest large sums in public works projects. These projects are generally motivated by politics, and are rarely fruitful. So-called “public works” projects are often shell ventures, which serve to funnel funds to political leaders and their friends. Those in power often grant the more legitimate government contracts to friends or to those most willing to bribe officials rather than to those who are most qualified. The private sector suffers as a result; rather than the government inducing growth by creating business, it creates a noncompetitive sector that relies on government revenue, while the rest languish. Once the commodity market experiences a downturn, the government is no longer able to finance these projects (Figure 8). With revenues from the exportation of prized natural capital squandered, such governments often incur large debt burdens to maintain spending. The alternative would be substantial spending cuts that would lead to the collapse of the private sector dependent on government support.³³

³²Richard Auty, *Sustainable Development in Mineral Economies* (Oxford: Clarendon Press, 1998).

³³Alan Gelb, *Oil Windfalls: Blessing or Curse?* (New York: Oxford University Press, 1988); Richard Auty, *Resource-Based Industrialization: Sowing the Oil in Eight Developing Countries* (New York: Oxford University Press, 1990).

Governments also borrow during booms. The practice of borrowing against the strength of a boom reflects the short-term thinking associated with rent-seeking leaders. As it is clear that booms are, by definition, short-lived, incurring debt in order to further boost public expenditures during a time of economic strength is highly reckless in the long term.³⁴

Figure 8: Growth and Public Expenditure in Ecuador, 1990-2006



Source: Reproduced from Cueva et al. (2007). Data from Central Bank of Ecuador.

An Economic and Environmental History of Ecuador

By all measures, Ecuador provides a perfect case study to examine in determining how these mechanisms play out historically. As Simón Cueva states, “Even though many Latin American countries share the dependence on export commodities, Ecuador—partly

³⁴M. Sarraf and M. Jiwanji, “Beating the Resource Curse: The Case of Botswana,” *World Bank, Washington D.C. Environmental Economics Series*, no. 83 (2001).

because of its small open economy characteristics—appears to be an extreme case of such feature.”³⁵

Traditional Life in Ecuador

When the Spanish arrived in what is now Ecuador in 1534, defining “traditional” life for the native population had already become difficult. Prior to the end of the fifteenth century, several ethnic groups, each with its own language and culture, inhabited what is now the Ecuadorian Sierra. The Pastos, Caras, and Panzaleos populated the north, while the Puruha and Cañaris occupied the south. Though these peoples often fought with each other, no one group was able to achieve dominance. Communities generally divided themselves into kin groups within which members were related by blood or by social bonds such as marriage or place of origin. Each community recognized one individual as the community’s political and economic leader, or *cacique*. The *cacique* oversaw the cultivation and harvesting of crops, most commonly corn, on plots of land that family groups passed down hereditarily. The warmer equatorial temperatures allowed inhabitants to produce food year-round unlike their southern counterparts in what is now Perú and Bolivia who had to develop methods of food preservation to maintain a surplus beyond the growing season.³⁶

The Incas conquered what is now the highland Sierra of Ecuador at the end of the fifteenth century during their last northward push. They subjugated the existing ethnic groups, though they allowed communities to stay mostly intact, so long as the *cacique*

³⁵S. Cueva, V. Albornoz, and L. Avellán, “Ecuador: Binding Constraints to Growth,” Mimeographed document (Washington, D.C.: Inter-American Development Bank, 2007), <http://www.iadb.org/res/files/GDM/GDM-FinalDrafts2008.htm>.

³⁶Suzanne Austin Alchon, *Native Society and Disease in Colonial Ecuador* (Cambridge University Press, 1991).

swore allegiance to the new rulers. Incan Quechua began to replace other indigenous languages that previously existed in the Sierra, eventually forming the northern dialect of Quichua that is still spoken in Ecuador. However, the Incas were unable to achieve the same complete cultural dominance as they had in the southern Andes because the arrival of the Spanish cut short their rein. Even before the Spanish marched into Ecuador, their influence had already touched the land. The Europeans' diseases moved more quickly than they did and began to take a large toll on the population. The Incan ruler, Huayna Capac, died of smallpox in 1525, and the Spanish arrived just as the empire was split by a civil war over his succession.³⁷

Ecuador's Colonial Legacy

In colonial times, Europeans regarded colonial holdings like Ecuador as harvesting grounds for natural resources with a convenient indigenous labor pool. Spanish conquistador Francisco Pizarro conquered the Incas in what is now Ecuador just as the European Renaissance was budding. As Europe emerged from the Middle Ages, its feudal structures gave way to nationalism and mercantilism. European sovereigns constructed roads and established common currencies, easing trade and making possible the birth of modern capitalism. The demand for resources rose, and Europe looked outward to meet this need. Colonies provided the resources, labor, and new markets needed to sustain growth in Europe. The Spanish were primarily interested in silver and

³⁷Ibid.

gold, which they did not discover in the area that is now Ecuador. They did, however, find a vast source of cheap labor.³⁸

Burgos Guevara estimates that a population of roughly 800,000 to one million people lived in Ecuador before the Spanish conquest, but European diseases killed many.³⁹ Smallpox and measles nearly eliminated the small population of the Costa. Due to the high-altitude climate, disease did not impact the larger population in the Sierra to as great an extent as those living in the Costa and other parts of Latin America. The Spanish instituted a feudal *encomienda* system in which the Crown entrusted Spanish settlers with parcels of land to cultivate in exchange for collecting an annual tribute from the land's remaining indigenous inhabitants, as well as converting them to Christianity. These indigenous inhabitants were essentially indentured servants that settlers often bought and sold with the land. They worked mandatory terms of service, or *mitas*, in exchange for the right to farm small agricultural plots of land that the Spanish called *minifundios*. They referred to their plots as *huasipungos*, a term that came from the Quichua for "door of the house" due to the fact that these plots were located just outside the door of each family's house. Roughly half of the Ecuadorian population worked in the *encomienda* or *huasipungo* system.⁴⁰

The colonizing countries inhibited direct industrial development in colonial holdings. The purpose of the colonies was to supply the resources necessary to fuel industrial growth in Europe, and to develop industry directly in the colonies would cut

³⁸William P. Glade, *The Latin American Economies: A Study of Their Institutional Evolution* (American Book, 1969).

³⁹H. Burgos-Guevara, "La población del Ecuador en la encrucijada de los siglos XVI y XVII," *Atti del XL. Congresso Internazionale degli Americanisti. Roma-Genova* (1974): 3–10.

⁴⁰Hanratty, *Ecuador*.

Europe out of the loop. Cheap labor made harvesting these resources easy. Therefore, the value placed on extraction disincentivized investment in human capital. The economist William Glade explained, "...by holding the opportunity costs of labor at a very low level for both the plantations and the mines, the latifundia-minifundia complex (reinforced by slavery and *mita* labor recruitment) operated to reduce considerably the incentive to modernize the technology and organization of the export industries. Reciprocally, the traditional organization of export agriculture and mining was such that it contributed very little to the development of the domestically oriented portions of the colonial economy."⁴¹ Thus, from the beginning, Ecuador entered the developing global capitalist market as a primary commodity producer dependent on a limited number of raw exports and was accustomed to capital outflow and lack of investment. Even after independence in 1830, Ecuador maintained an export economy, buffeted from one commodity boom to the next.⁴²

The Cacao Boom

While Ecuador lacked precious metals, the country did find its golden export: cacao. Ecuadorians called it the "pepa de oro," or "seed of gold," and it enjoyed extremely high global demand during the late nineteenth and early twentieth centuries. With an excellent climate for cacao cultivation, the Costa responded powerfully to this demand. For the most part, production took place on large plantations, owned by a growing planter elite. The cacao industry picked up in Chone around this time. Chonero cacao was known for its high quality, and became highly sought after by upscale

⁴¹*The Latin American Economies*, 134.

⁴²Francisco E. Thoumi, "The Hidden Logic of 'Irrational' Economic Policies in Ecuador," *Journal of Interamerican Studies and World Affairs* 32, no. 2 (Summer 1990): 43-68.

chocolate makers in Europe.⁴³ As the industry grew, planters began to eschew the old style of shade-grown polyculture cultivation in favor of a new sun-grown hybrid promoted by the government. This shift was responsible for much of the first wide-scale deforestation in the area.⁴⁴ Cacao quickly dominated the Ecuadorian economy; by 1904, Ecuador produced between one half and one third of the world supply of cacao (28,216 metric tons), and this amount nearly doubled by 1914 (47,210 metric tons). This represented nearly three-quarters of the exports of the country between 1885 and 1922.⁴⁵ By this time, Ecuador was the largest producer of cacao in the world, supplying 20 to 25 percent of the world's demand.⁴⁶

The cacao boom completely transformed Ecuador's social, economic, and physical landscapes. The burgeoning cacao haciendas created a large demand for labor in the previously sparsely inhabited Costa. This new monetary labor system directly competed with the feudal Sierran *encomienda* system, which had previously remained strong.⁴⁷ President Eloy Alfaro Delgado dreamed of constructing a railroad between Guayaquil in the Costa and Quito in the Sierra, enabling the expansion of haciendas inland and further facilitating increased migration of workers from the Sierra.⁴⁸ Tensions grew between the liberal Costa and conservative Sierra, and a series of civil wars broke out between the regions. Rebels killed conservative President Gabriel García Moreno in 1875 and liberal President Eloy Alfaro Delgado in 1912. In the end, the coastal leaders

⁴³Eva Bowen, Interview, April 14, 2010.

⁴⁴Judy Monseratte, Interview, April 23, 2010.

⁴⁵David William Schodt, *Ecuador: An Andean Enigma* (Westview Press, 1987).

⁴⁶Paul Henderson, "Cocoa, Finance and the State in Ecuador, 1895-1925," *Bulletin of Latin American Research* 16, no. 2 (1997): 169-186.

⁴⁷Carlos Larrea and Liisa L. North, "Ecuador: Adjustment Policy Impacts on Truncated Development and Democratisation," *Third World Quarterly* 18, no. 5 (December 1997): 913-934.

⁴⁸Henderson, "Cocoa, Finance and the State in Ecuador, 1895-1925."

proved dominant and freed many Sierran *huasipungueros* from their indentured servitude, though the last vestiges of the *encomienda* system would remain intact until the system was outlawed by the Land Reform, Idle Lands, and Settlement Act of 1964. Cacao haciendas drew massive numbers of workers, and though the railroad had a rocky start, the government successfully developed roads to facilitate this massive migration.⁴⁹ Cacao caused the first episode of large-scale deforestation in Ecuador; cacao trees needed land to grow, and tens of thousands of migrants needed places to settle. The roads enabled access to previously isolated forestlands.⁵⁰

While cacao transformed the Ecuadorian demography and environment, it did not move the country away from export dependence. In fact, cacao was Ecuador's first major commodity since independence, and intensified the emphasis on exports. Cacao reduced the importance of the old model of *encomienda*-style subsistence farming, and concentrated economic dependence on this one booming export market. During the First World War, demand for chocolate plummeted and the Ecuadorian cacao industry entered a period of crisis. Additionally, the witches' broom (*Moniliophthoraperniciosa*) and frosty pod rot (*Moniliophthoraroreri*) fungal diseases devastated cacao cultivations, destroying 60 percent of the crop between 1916 and 1931. The market never recovered. After 1930, vast amounts of cacao grown in British West Africa—grown using specimens collected in Ecuador by British scientists—dominated the world market, driving prices much lower. Ecuador's cacao production dropped from 48,955 tons to 13,646 tons. The cacao industry upon which Ecuador relied crashed, devastating the

⁴⁹Lois Johnson Weinman and Lois W. Roberts, *Ecuador and Cacao: Domestic Responses to the Boom-Collapse Monoexport Cycle* (University of California, 1970).

⁵⁰Paul Henderson, "Cocoa, Finance and the State in Ecuador, 1895-1925," *Bulletin of Latin American Research* 16, no. 2 (1997): 169-186.

national economy.⁵¹ The large plantation owners were ruined, and were forced to sell their land to banana companies and smallholding Ecuadorian farmers, resulting in a dramatic shift of the socioeconomic distribution of agricultural production in the Costa.⁵²

The Banana Boom

Two decades later came the banana boom, with Ecuador becoming the world's top producer of bananas by 1955 (Table 2). The Costa's ideal climate again made it able to respond to burgeoning world demand. Most bananas produced in Ecuador were destined for export, and large land holders produced the majority of those bananas (Appendix B). Large-scale migration from the Sierra to the Costa again took place. During this time, the Costa lost over 40 percent of its forests, with 75 percent forest cover in 1951 and about 33 percent in 1995.⁵³

The banana boom had a high human cost in addition to its environmental cost. The cloned banana monoculture commonly cultivated for export was highly susceptible to the deadly Yellow and Black Sigatoka fungal diseases. Plantation owners employed vast amounts of fungicides to keep the disease at bay, most notably dibromochloropropane (DBCP), which resulted in mass sterilizations among workers.⁵⁴ Later, in 1997, over 16,000 workers from Ecuador and five other Latin American nations would eventually triumph in a Texas class-action lawsuit forcing the four chemical

⁵¹Schodt, *Ecuador: An Andean Enigma*.

⁵²Jeffery W. Bentley, Eric Boa, and John Stonehouse, "Neighbor Trees: Shade, Intercropping, and Cacao in Ecuador," *Human Ecology* 32, no. 2 (2004): 241-270.

⁵³James J. Parsons, "Bananas in Ecuador: A New Chapter in the History of Tropical Agriculture," *Economic Geography* 33, no. 3 (July 1957): 201-216.

⁵⁴J. Timmons Roberts and Nikki Demetria Thanos, *Trouble in Paradise: Globalization and Environmental Crises in Latin America* (Routledge, 2003), 71.

corporations that produced DBCP to pay \$41.5 million in compensation.⁵⁵ However, it was not because of fungal diseases that the Ecuadorian banana boom ended. Rather, it was a symptom of the Dutch disease, brought on by the discovery of oil in Ecuador in 1967. The rise in the exchange rate that quickly followed the commencement of oil exportation caused Ecuador to lose its comparative advantage in banana production.⁵⁶

Table 2: International Banana Trade, 1935-1955

		<i>Averages</i>	
	<i>1955</i>	<i>1951-55</i>	<i>1935-39</i>
Ecuador.....	26,150	18,902	1,920
Central America-Carib- bean Area			
Costa Rica†.....	14,011	15,541	4,569
Panama†.....	12,130	8,611	9,779
Honduras†.....	10,929	12,503	11,723
Colombia†.....	9,243	7,348	7,475
Jamaica.....	7,627	5,251	13,042
Guatemala†.....	5,011	6,705	8,405
Guadeloupe.....	2,954	3,157	1,810
Martinique.....	2,284	2,435	1,336
Dominican Republic†..	1,882	1,779	291
Mexico.....	1,632	2,151	13,103
Nicaragua.....	400	460	1,982
Cuba.....	53	42	5,358
Other.....	2,014	1,121	1,483
	(69,298)	(68,107)	(80,336)
Brazil.....	9,291	8,811	9,366
Canary Islands.....	8,543	7,409	5,319
Other Africa.....	16,717	13,698	7,156
Taiwan.....	1,540	1,466	5,570
Oceania.....	950	529	552
World Total.....	131,489	118,616	110,249

Source: Reproduced from Parsons (1957)

⁵⁵Rebeca Vindas et al., "Genotoxicidad de tres plaguicidas utilizados en la actividad bananera de Costa Rica," *Revista de Biología Tropical*, 2004, 602.

⁵⁶Sven Wunder, "Ecuador Goes Bananas: Incremental Technological Change and Forest Loss," in *Agricultural Technologies and Tropical Deforestation* (Wallingford, Oxon, UK: Oxon, UK, CABI Publishing, 2001), <http://www.cifor.cgiar.org/Knowledge/Publications/Detail?pid=824>; David A. Preston, "Changes in the Economic Geography of Banana Production in Ecuador," *Transactions of the Institute of British Geographers*, no. 37 (December 1965): 77-90.

The Oil and Mineral Boom

Oil is the commodity with the most disastrous results for Ecuador, both economically and environmentally. Prior to the 1960s, the Oriente remained largely isolated. However, Texaco's 1967 discovery of oil opened the Oriente up to development and exploitation. Under Ecuadorian law, all subsoil mineral rights belong to the government. This holdover from the colonial-era Napoleonic Code grants the government unlimited access for mineral extraction regardless of the wishes of landowners. The Ecuadorian government granted a contract to foreign oil company Texaco to build and operate the new oil-pumping infrastructure, and thus the oil boom began.⁵⁷

New roads opened the way for settlers to move in through forest that was previously prohibitively dense. The 1973 homesteading land reform laws established that an individual had to cut 80 percent of the trees on a plot of land to "own" it. The result was the creation of boom towns of migrant oil workers and large-scale fishbone-effect deforestation, as settlers cleared plots off of the new roadways. However, deforestation pales in comparison to the environmental contamination incurred over the course of Texaco's twenty-year tenure in the Oriente. In total, the company discharged over 30 billion gallons of crude oil and toxic waste into old-growth, primary rainforest. Local residents reported rivers turning black for days at a time. For comparison, the 1989 Exxon Valdez spill in Alaska discharged 10.8 million gallons of oil. There are still around 200 open waste pits in the Oriente with no protective lining. Rivers once teeming with fish now no longer support aquatic life; the full environmental impacts are still

⁵⁷Sven Wunder, *The Economics of Deforestation: The Example of Ecuador* (St. Martin's Press, 2000), 94.

unknown. Affected human populations have experienced elevated rates of skin disease, birth defects, and overall mortality.⁵⁸

Economically, the oil boom neither led to significant growth nor alleviated poverty in Ecuador. Though the promise of jobs quelled many local concerns at first, many quickly realized that skilled labor was imported from abroad and only a few locals were employed to do low wage jobs. Increases in oil exports were matched by decreases in other exported commodities due to the Dutch disease phenomenon. The overall impact was to decrease economic diversification. The oil boom also left Ecuador grievously indebted. The OPEC oil embargo of 1973-74 allowed oil-producing countries to set oil prices based on remaining reserves, which generated enormous profits for banks and oil companies. Rich in money from the oil boom, American bankers had large incentives to offer loans to countries in the global South such as Ecuador and went to great lengths to bribe officials to take such loans. Shortly afterward, Saudi Arabia disobeyed the OPEC embargo, causing prices to drop just as Ecuador's debt came due. As Ecuador's economy now relied almost completely on oil, the government was forced to declare a moratorium on debt payments. This debt crisis ushered in what is known as the "lost decade," culminating in a 1999 collapse of the Ecuadorian economy and abandonment of the Ecuadorian currency, the sucre, in favor of the dollar.⁵⁹

However, the oil and mineral boom continues to this day. The story of the Intag Cloud Forest provides insight into how this boom affects people on the ground, and one way in which they might respond. Intag, located in the Imbabura province of Sierran

⁵⁸Miguel San Sebastián and Anna-Karin Hurtig, "Oil exploitation in the Amazon basin of Ecuador: a public health emergency," *Revista Panamericana De Salud Pública* 15, no. 3 (March 2004): 207-8.

⁵⁹John D. Martz, *Politics and Petroleum in Ecuador* (Transaction Publishers, 1987).

Ecuador, is extremely biodiverse, with endemism rates up to 40 percent. In the early 1990s, the World Bank awarded the Ecuadorian government a grant to map its subsoil mineral deposits. The study discovered copper and other valuable metals under Intag, and the government granted the Japanese company Mitsubishi a mining concession in 1994. Impact studies of the potential mining project found that so much deforestation would take place that the climate would become significantly drier, heavy metals would contaminate the remaining water supply, entire communities would have to be relocated, and an unknown number of species would become extinct; in short, it would be an ecological disaster beyond description. In 1996, liberation theologian Giovanni Paz founded Defensa y Conservación Ecológica de Intag (DECOIN) to rally the residents of the Intag region against the mining project. Together, they were able to oust Mitsubishi from the region, and later do the same for Ascendant Copper, a Canadian company that later attempted to pursue the same project after receiving a government concession in 2004. Many herald Intag as a major success story of community-based resistance against the forces of extractive industry. DECOIN's grassroots efforts not only removed the threat that mining posed to residents' economic and environmental wellbeing, but also educated the community on environmental concerns and sustainable living. It is unknown whether another company—or perhaps the Correa government—will come again.⁶⁰

Similarly, in the Mache-Chindul Ecological Reserve, located between the Esmeraldas and Manabí provinces, the Chinese company Sinopec has recently begun

⁶⁰Glen David Kuecker, "Fighting for the Forests: Grassroots Resistance to Mining in Northern Ecuador," *Latin American Perspectives* 34, no. 2 (March 1, 2007): 94-107; Linda D'Amico, "Grassroots Environmentalism in Intag, Ecuador", 2010.

prospecting for oil under a permit granted by the government in 2008. Company officials have entered residents' property without their permission, conducting invasive seismic tests and leaving behind gaping holes. The Reserve contains one of the last remaining humid tropical forests in the Costa, with an extremely high level of biodiversity and endemism, and it is unknown how the project may progress.⁶¹ Yasuní National Park, often touted as the most biodiverse place on the planet, also possesses oil reserves buried beneath the forest. The Yasuní-ITT (Ishpingo-Tambococha-Tiputini) project aims to keep that oil underground in exchange for payments from countries in the global North amounting to half of the value of the oil. President Correa, however, has been highly outspoken against the project, and is in favor of extracting the oil below the Yasuní.⁶²

Beyond the Boom

Government officials have heralded each new commodity boom in Ecuador as the country's long-awaited deliverance from underdevelopment. However, each commodity boom has left the country no better off in terms of poverty and inequality and in many cases has saddled local populations with large environmental costs. By relying on a series of single exports for the majority of economic activity, Ecuador has continually subjected itself to the whims of international markets. Commodity markets tend to be volatile, and once the particular market upon which the country's economy depends stagnates, the entire country's economy collapses, worse off than before for lack of

⁶¹"En Los Bosques De La Mache Chindul Se Busca Petróleo," *El Comercio*, February 17, 2010, <http://www4.elcomercio.com/Generales/Solo-Texto.aspx?gn3articleID=20781>.

⁶²Matt Finer, Remi Moncel, and Clinton N. Jenkins, "Leaving the Oil Under the Amazon: Ecuador's Yasuní-ITT Initiative," *Biotropica* 42, no. 1 (2010): 63-66.

development in other sectors and generally saddled with severe environmental costs.⁶³ Since colonial times, Ecuador has experienced this story several times, developing a culture of extraction and exportation. Even well-meaning officials who truly want to improve the lives of their fellow citizens see exports as the solution. However, humans both rely on valuable services provided by those things being commoditized and provide services that are economically valuable but non-commoditized. By placing universal economic value on commodity exports, such a culture devalues both types of services.

Commoditizing Natural Capital

At the root of human economic activity is the consumption and transformation of natural resources. Without the primary commodities that resource-rich countries like Ecuador provide, industrialized countries such as the United States could not have sustained the growth they have experienced since pre-colonial times. That the source of economic wealth is natural capital is a fundamental connection that is repeatedly overlooked in discussions of economic development.⁶⁴

The global North's hunger for natural resources has warped its scholars' understanding of economics and the environment. Rather than view these concepts as inextricably linked, many purposely divide them, viewing the environment as having no value until commoditized. Commoditized resources, once made available in the global market, are to be used as inputs for economic growth. The process of commoditization separates these resources from their locales of origin, which each have their own unique

⁶³Michael Lewin Ross, "The Political Economy of the Resource Curse," *World Politics* 51, no. 2 (1999): 321-2.

⁶⁴Carl Safina, *Song for the Blue Ocean: Encounters Along the World's Coasts and Beneath the Seas* (Macmillan, 1999).

ecological limitations. These locales are also located in specific places in the world, which have human communities and webs of life that depend on them.⁶⁵ For most people, therefore, the growth we experience in the global North is not conceptually connected to the depletion of environmental resources in the global South. Referring to the plight of countries such as Ecuador as the resource “curse” as if it is an unavoidable affliction for which no one is responsible exposes this disconnect.

The natural wealth of countries such as Ecuador is unparalleled, yet rather than value the services that wealth provides, which would then create an incentive to sustain it, an export commodity culture values only its extraction and sale as a commodity. The Ecuadorian government justifies this action by arguing that it is liquidating those resources into capital that is useful now—capital that can be used to improve the quality of life of local people. This argument, however, fails to recognize that natural capital in its raw form has been useful to locals for generations. After outsiders extract this wealth, locals are left without any way to support themselves in the long-term. Unable to live off the land any longer, they become the urban poor. Meanwhile the extraction process irrevocably destroys the immense biodiversity that so defines these areas.⁶⁶

History makes it clear that themes of domination of the South by the North have carried on from colonial times into the present day. This is rarely acknowledged in traditional economics, but it begs the question: is the plight of the global South an anonymous “curse,” or does the global North play an active role in its creation, wittingly or unwittingly?

⁶⁵Alexander Sarris and David Hallam, *Agricultural Commodity Markets and Trade: New Approaches to Analyzing Market Structure and Instability* (Edward Elgar Publishing, 2006).

⁶⁶Richard L. Harris and Jorge Nef, *Capital, Power, and Inequality in Latin America and the Caribbean* (Rowman & Littlefield, 2008).

The Resource “Curse”

There are centuries of economic thought in the global North obscuring the causal relationships responsible for the resource curse, but they remain evident to any student of history. To such students the phenomenon seems improperly named. Countries like Ecuador are not anonymously “cursed.” Rather, they are the victims of a system that the global North began during colonialism to gain access to their natural wealth while leaving as little of the proceeds as possible for the people unfortunate enough to live there. To this day, leaders in the global North have every incentive to reinforce the export culture because it benefits them. Until their counterparts in the global South understand this reality, the most biodiverse places in the world will continue to also be the most environmentally ravaged and poverty-stricken.

In the late 1950s, some economists began to challenge the predicted outcomes of the neoclassical economic theories used in development economics based on empirical evidence of underdevelopment in the global South, questioning whether these models were valid or possibly even counterproductive. These concerns coalesced in the work of Argentine economist Raul Prebisch, the Director of the United Nations Economic Commission for Latin America, who laid the foundation for what was to become the “Dependency Theory” school of thought.⁶⁷

Dependency Theory takes a much wider view of development economics, focusing on the systematic disadvantages of the South in the global economy. As conceived by Prebisch, the argument is that countries in the South provide primary commodities to countries in the North that manufacture products out of those inputs and

⁶⁷Vincent Ferraro, “Dependency Theory: An Introduction” (Mount Holyoke College, July 1966), <http://www.mtholyoke.edu/acad/intrel/depend.htm>.

resell them to the South. Due to the value added during the manufacturing process, the final product always costs more than the primary commodities used as inputs. Therefore, countries in the South never earn enough from exports to pay for imports of the final goods they helped create.⁶⁸

There are two related schools of thought that elaborate further upon this basic conception of dependence. In the 1970s, Immanuel Wallerstein developed the “World Systems” approach. This approach is more holistic than basic dependency theory, recognizing that existing power structures make the global economy inherently unfair, leading to a systematic division of labor that serves the rich and punishes the poor. Wallerstein specifically took aim at the doctrine of comparative advantage, a core tenet of economic trade theory. Following the World Systems approach, the fact that poor, resource-rich countries have a comparative advantage in creating and exporting primary commodities means they must therefore specialize in that area to remain competitive in the global capitalist market. This forces a rigid division of labor, where those in the global South are trapped as wage laborers while those in the global North are able to enjoy positions of comparative power further up the economic food chain. Wallerstein argued that this system is directly responsible for maintaining poverty and underdevelopment in the global South.⁶⁹

Economic historian André Gunder Frank incorporated Marxist philosophy into his reading of underdevelopment. Largely parallel to the World Systems approach, his argument is couched in the Marxist terminology of capitalist exploitation. One specific point that other dependency theorists would likely agree with, but which Frank articulates

⁶⁸Ibid.

⁶⁹I. Wallerstein, *The modern world-system*, vol. 2 (Academic Press New York, 1974).

most clearly, is that *underdevelopment* is different from *undevelopment*. That is, there is not one linear path of development that Northern countries have successfully trod and that Southern countries happen to be lagging behind on. Frank states, “Even a modest acquaintance with history shows that underdevelopment is not original or traditional and that neither the past nor present of the underdeveloped countries resembles in any important respect the past of the now “developed” countries.”⁷⁰ While the global North may have been undeveloped—that is, their resources were not in use at some point in the past—they were never underdeveloped. Underdevelopment refers to the situation in which resources are not used to their full socioeconomic potential. Frank states that when Northern countries diffuse capital, institutions and values in Southern countries in the guise of “development,” they are actually ensuring continued dependence and underdevelopment in those countries. He concludes that true economic development cannot take place in the South unless they it is separated from the North.⁷¹

Human Capital

The many mechanisms that economists commonly propose to explain the resource “curse” do not explicitly account for the role of the global power dynamics highlighted by dependency theorists in causing underdevelopment. However, dependency theory greatly informs the modern resource curse discussion. The connection is clear when viewing the resource curse in terms of human capital as its transmission vector. This is the approach that Alexis Manning proposes. The mechanisms by which economists generally explain the effect of resource abundance on economic growth—the Dutch

⁷⁰James Cockcroft, Andre Gunder Frank, and Dale L. Johnson, *Dependence and Underdevelopment: Latin America's Political Economy* (Garden City N.Y.: Anchor Books, 1972), 3.

⁷¹*Ibid.*, 3-45.

disease, volatility, rent seeking and corruption, and unproductive investments—all primarily impact human capital. There is growing evidence to suggest that it is their impact on human capital that facilitates their impact on economic growth.⁷² This is understandable, as there is a large amount of support in economic literature supporting a strong causal link between high levels of human capital and high economic growth.⁷³

Economists traditionally define human capital as the skill set and knowledge of workers that informs their economic productivity. Investment in human capital has the positive externality of human empowerment. Skills and knowledge are power that can translate into the social, economic, and political realms. We have already seen how some of the mechanisms of the resource curse discourage investment in human capital. However, it is not as complex as some scholars suggest. In general, the presence of resources and the knowledge that rich and powerful countries desire and will pay for those resources shifts value away from humans and onto commodities. Manning states: “If a developing country possesses a large natural resource endowment, this country will devote its efforts and resources to the exploitation of the natural resource, because it possesses a comparative advantage.” Investment in human capital often poses an expensive upfront cost, whereas short-term resource exploitation provides windfall profits. It is unsurprising therefore, that nearly all resource-rich countries in the global South continually choose the latter. Resource-based industries are the least human capital intensive, so as they grow—which they generally do at the expense of other industries following the Dutch disease—investment in human capital seems less and less

⁷² Alexis Manning, “Human Capital as a Transmission Mechanism of the Resource Curse,” *The Park Place Economist* 12 (2004): 75–86.

⁷³ Richard M. Auty, “The political economy of resource-driven growth,” *European Economic Review* 45, no. 4-6 (May 2001): 839-846.

rational. The rent seeking behavior of government officials provides them with an additional disincentive to invest in human capital: empowering the populace could lead to increased accountability and exposure of their corruption. Even when officials initiate public programs, they are generally highly unproductive in nature. Manning also points out that the type of investment education that takes place in resource-poor countries is different from the consumption education typical of resource-rich countries in that an investment education empowers the populace while a consumption education does not. Finally, when the volatile resource boom collapses, the country is crushed, as workers have no autonomy and no skills on which to fall back.⁷⁴ It is this syndrome that prompted Juan Pablo Pérez Alfonso to famously call oil “the devil’s excrement,” and Sheik Ahmed Yamani to lament, “All in all, I wish we had discovered water.”⁷⁵

Wallerstein and Frank might employ the term “human capital” in a broader sense, encompassing individuals’ cultural attributes, inherent rights, and abilities to provide services that are not traditionally quantified in neoclassical economic terms. They would likely agree, however, that investment in human capital empowers individuals. They see many of the same faults with the global economic system based on comparative advantage outlined by Manning in his framework analyzing the modern resource curse. However, they would further argue that the global North is responsible for these faults. While there is a large consensus surrounding the assertion that many features of the resource curse are self-perpetuating and based more on the incentive structure created by the mere presence of resources, it is undeniable that the willing buyers in the North

⁷⁴ Manning, “Human Capital as a Transmission Mechanism of the Resource Curse.”

⁷⁵ Juan Pablo Pérez Alfonso was Oil Minister of Venezuela and Co-Founder of OPEC; Sheik Ahmed Yamani was Oil Minister of Saudi Arabia.

benefit. Countries in the global North get access to valuable resources that they may have exhausted within their borders long ago. Therefore, they also have a disincentive to invest in human capital and thereby empower the populace to possibly challenge their access to resources. Resource-abundant countries in the global South, therefore, tend toward having no advocates for investment in human capital and empowerment.

This tendency is representative of a larger movement within resource-abundant countries from a long-term to a short-term decision horizon. Human capital is generally self-perpetuating; that is, parents pass skills, knowledge, and empowerment on to their children. Therefore an investment in human capital is a long-term investment. As discussed, however, the decision horizon in resource-rich countries narrows until it focuses only on securing short-term rent revenue. Human empowerment and environmental stewardship are among those that suffer most from this shift.

Conclusion

The resource curse is not an enigma. Resource abundance impedes economic growth via the Dutch disease, economic volatility, rent-seeking behavior and corruption, and unproductive public investment. It does so because each of these syndromes disincentivizes investment in human capital. The neoclassical development theories of the global North cement these tendencies through the principle of comparative advantage. Thus, though each of Ecuador's boom-bust markets has proven disastrous for the Ecuadorian people, economy, and environment, a shift away from this cycle is not possible when export commodities represent the only way for the country to compete in the global market upon which it currently depends on for all of its basic needs. A degree of domestic economic independence would be necessary to achieve any shift away from

commodity markets, but it is not clear how this could be achieved. Policies of Import Substitution Industrialization protectionism in the past have not led to market independence, diversification, and investment in human capital; rather, just as did market liberalization, they led to further intensification of export commodity markets. The policy situation is far more nuanced than simple protectionism or liberalization, and will require a willingness to question existing fundamental beliefs in international development in order to move forward.

Chapter 2

The Ecuadorian Rentier State: State Failure and Market Failure

“The problems that exist in the world today cannot be solved by the level of thinking that created them.”

– Albert Einstein

Many Ecuadorians are intensely frustrated with their government, despite the fact that they remain ever optimistic and fiercely political. Each farmer with whom I spoke immediately brushed aside the notion of going to the government as recourse to address the very real problems they face. They each perceived the government as corrupt, and rightly so following nearly every major global index of government corruption. As I found in my interview with farmer Eva Bowen, many Choneros perceive the government as actively out to hinder their economic prospects.⁷⁶ It is admirable, given these feelings, that Ecuadorians still feel a surge of optimism with every new political candidate promising change.

Mistrust and frustration with government is understandable when it is the government that institutes and maintains many of the policies that cause the problems people face. In the case of the copper mining project in the Intag Cloud Forest, for example, it was the government that granted the mining concessions to Mitsubishi and Ascendant Copper in the first place. Similarly, in the Amazon, it was the government that granted the oil extraction concession to Texaco and stood by it as it flagrantly abused the local human population and ecosystem.

What is it that makes the Ecuadorian government support the interests of foreign corporations over those of its own citizens in cases like these? Since the Ecuadorian

⁷⁶Bowen, Interview.

government frequently states that its goal is to reduce poverty, what approaches has it taken, and how have they ended so badly for the populace?

In this chapter, I examine these questions by outlining the three main economic regimes that the Ecuadorian government has employed in attempting to address underdevelopment: Import Substitution Industrialization (ISI), neoliberal market reform, and New Leftism. In my analysis, I assert that none of these approaches have enjoyed success because they are each based on macroeconomic theory created in the global North world and imported into Ecuador without being tailored to the Ecuadorian context. I argue that resource abundance creates political conditions that specifically prevent the cautious development and tailoring of policy. Finally, with the purely theory- and policy-based approaches to development frustrated, I turn back to the case presented by Hacienda Santa Cecilia.

State vs. Markets

As in the rest of Latin America, the 1990s in Ecuador saw broad neoliberal market reforms. The 1990s also saw increasing inequality and environmental devastation, with some of the highest deforestation rates in recorded history. As the decade drew to a close, the statist left took many countries by storm, blaming market reforms for the plight of the people. Once the left took power, however, inequality and environmental devastation only increased. This suggests, therefore, that on a basic level the traditional debate of markets versus state intervention is not sufficient in explaining underdevelopment in Ecuador.

I argue that both markets and the state have failed Ecuador, and that their failures are related. The market reforms that the Ecuadorian government implemented were

untailored for the Ecuadorian context and did more to give birth to crony capitalism—i.e. increased inequality—than to establish a healthy private sector. The legislature did not design the reforms carefully due to the toxic political atmosphere created by populism and a lack of political institutionalization. There is growing evidence that Ecuador's status as a “rentier” state, a state that relies on rents for natural resources for the majority of its income, might explain its struggle with political institutionalization and therefore successful market reform. The relationship between state intervention, market forces, and country-specific characteristics like culture and resource abundance is far more complex than generally understood. The key to understanding poverty and environmental devastation in Ecuador is understanding this complex relationship.

Import Substitution Industrialization

Beginning during the 1950s, dependency theory began to take root among development scholars. Many believed that underdeveloped countries would never develop unless removed from the international system that made them that way. Raúl Prebisch, the father of dependency theory, proposed Import Substitution Industrialization (ISI) as the economic development solution. ISI is essentially economic protectionism with a focus on the creation of local industry. Many saw the eventual failure of ISI as a failure of all of dependency theory. However, its failure did nothing to challenge the power dynamics described in Wallerstein's and Frank's works.

ISI regimes came to power throughout Latin America in the 1970s, and their basic premise was to protect infant industries so that they might develop and become able to compete with already-developed industry in other countries in the global market. However, though its theoretical underpinnings may have had merit, ISI was one of the

greatest policy failures in the history of development by nearly every measure. There is a broad consensus in the literature that it increased inequality, poverty, and underdevelopment in Latin America.⁷⁷ Even Raúl Prebisch, the creator of dependency theory and later ISI policy, reversed his stance, stating in 1963:

An industrial structure virtually isolated from the outside world thus grew up in our countries...The criterion by which the choice was determined was based not on considerations of economic expediency, but on immediate feasibility, whatever the cost of production...tariffs have been carried to such a pitch that they are undoubtedly – on an average – the highest in the world. It is not uncommon to find tariff duties of over 500 per cent...the proliferation of industries of every kind in a closed market has deprived the Latin American countries of the advantages of specialization and economies of scale, and owing to the protection afforded by excessive tariff duties and restrictions, a healthy form of internal competition has failed to develop, to the detriment of efficient production.

The failure of ISI was especially apparent in Ecuador, where the country's small size meant that it did not have the market necessary to achieve the cost savings associated with economies of scale in any industries.⁷⁸ At the same time, environmental destruction and economic inequality increased in Ecuador under ISI.⁷⁹ ISI did not tackle the core underlying mechanisms of the resource curse, leaving unchanged the rent-seeking export mentality Ecuador always had. ISI simply shifted losses from the Dutch disease toward increased unproductive investment projects. Because ISI focused on eliminating dependence on the global economic system and the global North and not on eliminating resource dependence, it failed to accomplish either.

⁷⁷ Albert O. Hirschman, "The Political Economy of Import-Substituting Industrialization in Latin America," *The Quarterly Journal of Economics* 82, no. 1 (February 1, 1968): 1-32.

⁷⁸ Werner Baer, "Import Substitution and Industrialization in Latin America: Experiences and Interpretations," in *Economic Strategies and Policies in Latin America*, by Jorge I. Domínguez (Taylor & Francis, 1994).

⁷⁹ Douglas Southgate and Morris Whitaker, "Promoting Resource Degradation in Latin America: Tropical Deforestation, Soil Erosion, and Coastal Ecosystem Disturbance in Ecuador," *Economic Development and Cultural Change* 40, no. 4 (July 1992): 787-807.

The 1990s: The Decade of the Market

In the 1990s, the failure of ISI policy was used as a reason to propose radical neoliberal reforms. These reforms were the opposite of ISI, and returned to the neoclassical economic models whose failures had sparked the creation of dependency theory in the first place. In *A Brief History of Neoliberalism*, David Harvey defines neoliberalism as, "...in the first instance a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade."⁸⁰ Neoliberal policies generally remove trade restrictions while privatizing resources, generally in concert. Though the land used to produce or extract that resource often already has inhabitants, neoliberal privatization rarely puts the control of that resource in their hands.⁸¹

The neoliberal school of thought is complex and multifaceted, but for the purposes of this thesis, I focus on its underlying mindset and on assessing whether its implementation in Ecuador addressed the underlying causes of the resource curse. Neoliberalists hold that individualism and entrepreneurship are inherent features of mankind that can simply be liberated by removing the barriers posed by public ownership, regulation, and trade tariffs. This ideology ran strong in Ecuador, where efforts at market reform began as early as 1984 with the presidency of León Febres Cordero. Every major Ecuadorian presidential candidate between 1984 and 2006 advocated neoliberal market reform (Figure 9).

⁸⁰ David Harvey, *A Brief History of Neoliberalism* (Oxford University Press, 2007).

⁸¹ Jacquelyn Chase, *The Spaces of Neoliberalism: Land, Place and Family in Latin America* (Kumarian Press, 2002).

Market reforms peaked with the dollarization of the Ecuadorian economy in 2000, and, in 2006, Ecuador experienced a leftist backlash similar to that of other Latin American countries. The rising left argued that neoliberal policies like dollarization had ruined Ecuador, fragmenting labor markets and raising prices. However, the situation is more complex; it was neoliberalism applied within the context of a country that lacked both political institutionalization and market institutionalization that created such problems.

Figure 9: Ecuadorian Political Candidates' Positioning vis-à-vis Market Economics

	1979		
	C_W	C_L	
Statism	1984	C_L C_W	Free markets
Statism	1988	C_L C_W	Free markets
Statism	1992	C_L C_W	Free markets
Statism	1996	C_W C_L	Free markets
Statism	1998	C_L C_W	Free markets
Statism	2002	C_L C_W	Free markets
Statism	2006	C_L	Free markets
Statism	2009	C_L	Free markets
Statism	I_W	C_L	Free markets

C_W , winning candidate; C_L , losing candidate; I_W , winning incumbent

Source: Electoral record from National Electoral Council of Ecuador
[Produced by author following design of Corrales (2008)]

Political Institutions and Populism in Ecuador

Despite the fact that every presidential candidate in Ecuador from 1984 to 2002 advocated neoliberal policies, Ecuador never achieved full market reform. The country continually lagged behind other Latin American countries in terms of economic freedom.⁸² This paradox is difficult to understand outside the context of Latin American politics. Ecuador is dominated by populism, a political strategy that politicians have employed in many Latin American countries for several decades. Populism is the amassing of power by uninstitutionalized mass movement.⁸³ One might even define populism as anti-institutional; a man will rise to prominence, convincing the masses that he will stand up for the people against the corrupt elite.⁸⁴ Starting with the first Ecuadorian election after the restoration of democracy in 1979, the country has had a series of populist candidates with very little progress toward the formation of stable political parties (Figure 9).

Mark Payne finds Ecuador to have the second-most fragmented party system in Latin America.⁸⁵ Accordingly, Ecuador has one of the lowest levels of political institutionalization in Latin America, where political institutionalization is the degree to which stable political parties and government agencies exist within a country.⁸⁶

⁸²Javier Corrales, "The Backlash against Market Reforms in Latin America in the 2000s," in *Constructing democratic governance in Latin America*, by Jorge I. Domínguez and Michael Shifter (Johns Hopkins University Press, 2008).

⁸³ Cas Mudde, "The Populist Zeitgeist," *Government and Opposition* 39, no. 4 (September 2004): 542-563; Kurt Weyland, "Neopopulism and neoliberalism in Latin America: Unexpected affinities," *Studies In Comparative International Development* 31, no. 3 (September 1996): 3-31.

⁸⁴ Note use of "he"—in Ecuador, the culture of populism is closely linked to the machismo culture. Many identify power with the leadership of a man, and most populist movements have centered on men.

⁸⁵J. Mark Payne et al., *Democracies in Development: Politics and Reform in Latin America* (Inter-American Development Bank, 2002).

⁸⁶M. C Araujo et al., "Political Institutions, Policymaking Processes, and Policy Outcomes in Ecuador," *Washington, DC: Latin American Research Network, Inter-American Development Bank* (2004).

Institutionalized (or “consolidated”) democracies possess strong civic societies and universal deference to the political process. This is to say that the losers in an election trust that they will have a chance to contest for power under the same rules in the future; they believe that the winners will not change the rules. Political scientists identify institutionalization as an important determining factor in the success of policy moderation, accommodation, and implementation.⁸⁷ In democracies, institutionalization provides avenues for different factions to work out their disagreements; the formation of institutions generally coincides with the development of a civic society. The winners and losers produced during elections are forced to resolve their problems through appropriate channels, and will respect the outcome of each election because of the prospect of another chance to vie for power in the future under the same rules. Once a democracy reaches this level of societal integration, we say that it is a “consolidated” democracy. As Larry Diamond states, in such countries, democracy “becomes routinized and deeply internalized in social, institutional, and even psychological life, as well as in political calculations for achieving success.”⁸⁸ Democracy without political institutions and a healthy, competitive civic society is corrupt, just as capitalism without regulation and a healthy, competitive private sector is exploitative.

In a consolidated democracy, it is possible to garner the support of both sides for moderate but meaningful policy development. On the contrary, populist presidents elected in unconsolidated democracies like Ecuador generally feel they have a mandate from the electorate to enact sweeping change, but also may not have voting blocs to rely

⁸⁷Hector E. Schamis, “Populism, Socialism, and Democratic Institutions,” *Journal of Democracy* 17, no. 4 (2006): 20-34.

⁸⁸Larry Diamond and Marc F. Plattner, *Democracy: A Reader* (Johns Hopkins University Press, 2009).

on once in office. Such a situation can either result in deadlock or have more extreme results. If the president has a monopoly on power, one might see the implementation of extreme policy change. If the opposition gains in strength relative to the president, it becomes only a matter of time before they take control by force. Several Ecuadorian presidents have been removed from office in this manner, such as Abdalá Bucaram in 1997, Jamil Mahuad in 2000, and Lucio Gutiérrez in 2005.⁸⁹ Populism continues to dominate the Ecuadorian political process, which shows no signs of institutionalization.

The Results of Market Reform

Despite the fact that neoliberal presidents reined for two decades, their populist strategy makes it unsurprising that they were not able to implement reforms in a consistent, effective manner.⁹⁰ However, populism and weak political institutions did not fully prevent the execution of market reforms in Ecuador. Populists were able to implement some market reforms, including lifting trade restrictions, eliminating subsidies, and most importantly, dollarizing the economy. While the results may have been different had reforms been planned and implemented differently, the reforms that were enacted had many negative consequences for Ecuador's population.

Some opponents of neoliberalism cite the lack of growth in Ecuador's GDP compared with other countries over the course of the 1990s as proof of the failure of market reform. While this should certainly be considered an indicator of trouble, other indicators more accurately demonstrate the effects of reform on the people. During the

⁸⁹ Andrés Mejía Acosta and John Polga-Hecimovich, "Soluciones parlamentarias a las crisis presidenciales en Ecuador," *Revista Latinoamericana de Política Comparada* 4 (January 2011): 49.

⁹⁰ Kurt Weyland, "The Rise of Latin America's Two Lefts: Insights from Rentier State Theory," *Comparative Politics* 41, no. 2 (2009): 145–164.

1990s, real wages fell considerably. John Weeks finds that despite the fact that unemployment showed no real pattern aside from cyclical variation, Ecuadorian real wages peaked in 1982, and fell considerably throughout the 1990s.⁹¹

One explanation for this decline in real wages is that market reforms introduced increased competition from foreign firms with higher productivity, which caused domestic firms to lower wages in order to stay competitive. They could not compete otherwise; high productivity is something that must be built up through investment in technology and human capital (i.e. education), which takes time and resources.⁹² It is difficult to raise productivity in uncompetitive firms after unprotected exposure to foreign competition if it has not been built up beforehand due to its lagging nature.⁹³ Thus it is unsurprising that private employment did not rise greatly; in fact it fell in some areas. At the same time, public employment also declined. Labor regulations were relaxed, and trade unions lost much of their power. Firms were permitted to cut benefits as well as wages in the pursuit of lower costs by as much as 15 percent, a trend seen elsewhere in Latin America that was especially strong in Ecuador (Figure 10). More importantly, salaried employment decreased as a proportion of employment. Thus, there was a move from formal employment to unstable, informal sector.⁹⁴

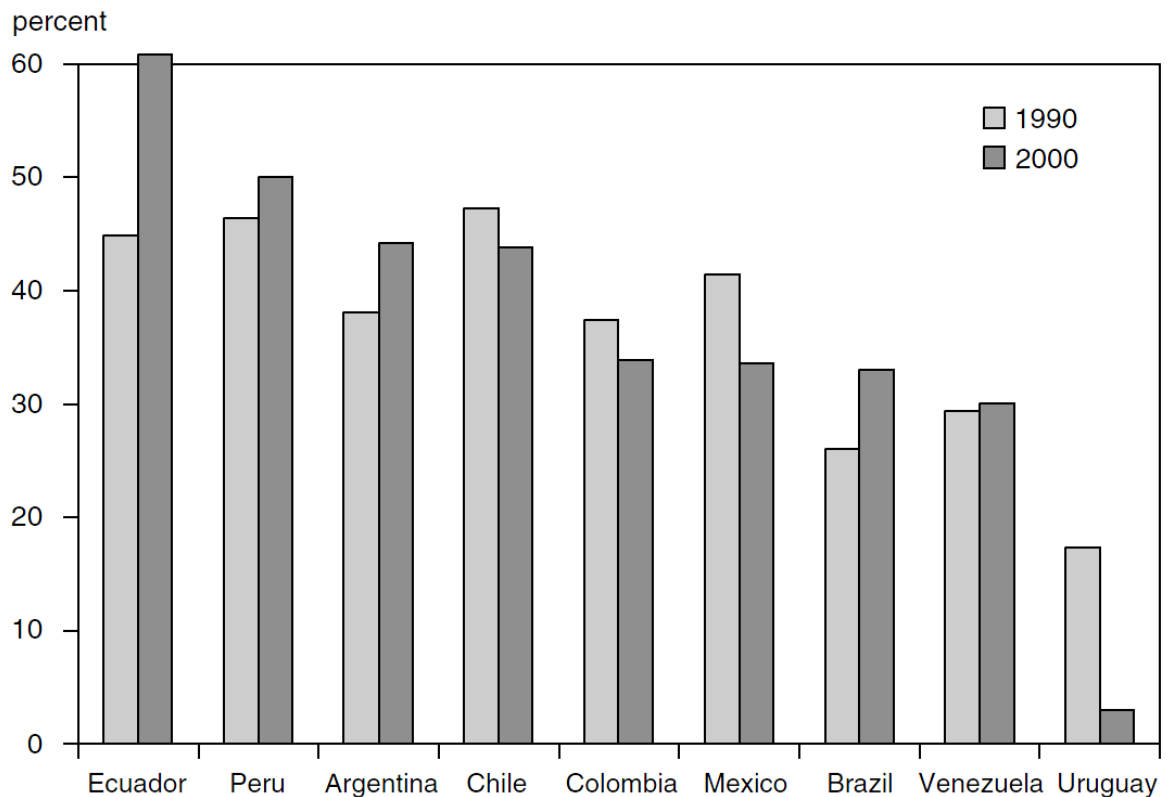
⁹¹John Weeks, “Salarios, empleo y derechos de los trabajadores en América Latina entre 1970 y 1998,” *Revista Internacional del Trabajo* 118, no. 2 (June 1999): 169-188.

⁹²Carmen Pagés, *The Age of Productivity: Transforming Economies from the Bottom Up* (Palgrave Macmillan, 2010).

⁹³Beth Yarbrough and Robert Yarbrough, *The World Economy: International Trade* (Thomson/South-Western, 2005).

⁹⁴J. Saavedra, “Labor Markets during the 1990s,” *After the Washington Consensus: Restarting Growth and Reform in Latin America*. Washington, DC: Institute for International Economics (2003).

Figure 10: Percentage of Salaried Workers with No Access to Social Security, 1990 and 2000



Source: Reproduced from Saavedra (2003). Data for Chile are from Packard (2001) and correspond to the percentage of the economically active population with no contribution to social security. The final period corresponds to 1999. All other data from ILO (2001).

These changes are part of a larger fragmentation of the labor force. Productive, skilled workers generally benefited from market reform, while less skilled workers—especially women and youth—found jobs with precarious conditions or no jobs at all. The latter group, far larger in Ecuador than the skilled, productive minority, often has no alternative but to turn to informal employment or crime. There is a wealth of literature supporting the assertion that increasing the flexibility of the labor market creates increased opportunity, so this outcome may seem surprising. Saavedra argues that while market reform will always have winners and losers, market reform without an emphasis on labor reform places an unfair amount of risk on labor. Indeed, while labor market flexibility may be a virtue, most would agree that there must be standards for the fair

treatment of workers. The challenge, therefore, is to design regulation that protects workers' rights without sacrificing efficiency and jobs.⁹⁵ Successful reform must navigate this challenge rather than simply deregulate, as did reforms in Ecuador.⁹⁶ Such cautious reform would require the political moderation and careful implementation that are woefully lacking in Ecuador.

Another major factor affecting people on the ground is inflation. Historically, Ecuador's traditional currency, the "sucre," has experienced enormous volatility due to the Ecuadorian economy's dependence on export commodities. Export commodity volatility plays a crucial role in Ecuadorian GDP performance, a fact that did not change with market reforms of the 1990s (Figure 7).⁹⁷ At that time, Ecuador's main export by a vast margin was oil—an extremely volatile commodity. After a particularly severe episode of inflation, Ecuador abandoned the sucre in favor of the dollar. Dollarization was in many ways the ultimate neoliberal reform, as it accomplished much of what populist presidents could not for years. In one move, the Ecuadorian state totally relinquished its control of monetary policy while easing foreign trade and investment.⁹⁸ The immediate result was further hyperinflation, with prices skyrocketing 200 to 300 percent (Figure 11). The rate of inflation eventually leveled out at expectedly low, stable levels but the inflated prices took a toll on the people.⁹⁹ Already struggling due to decreases in the real wage and reductions in benefits, formal employees were hit hard by

⁹⁵ Consistent labor standards can actually increase efficiency by lowering the cost of contract negotiations.

⁹⁶D. S Kaplan, "Job creation and labor reform in Latin America," *Journal of Comparative Economics* 37, no. 1 (2009): 91–105.

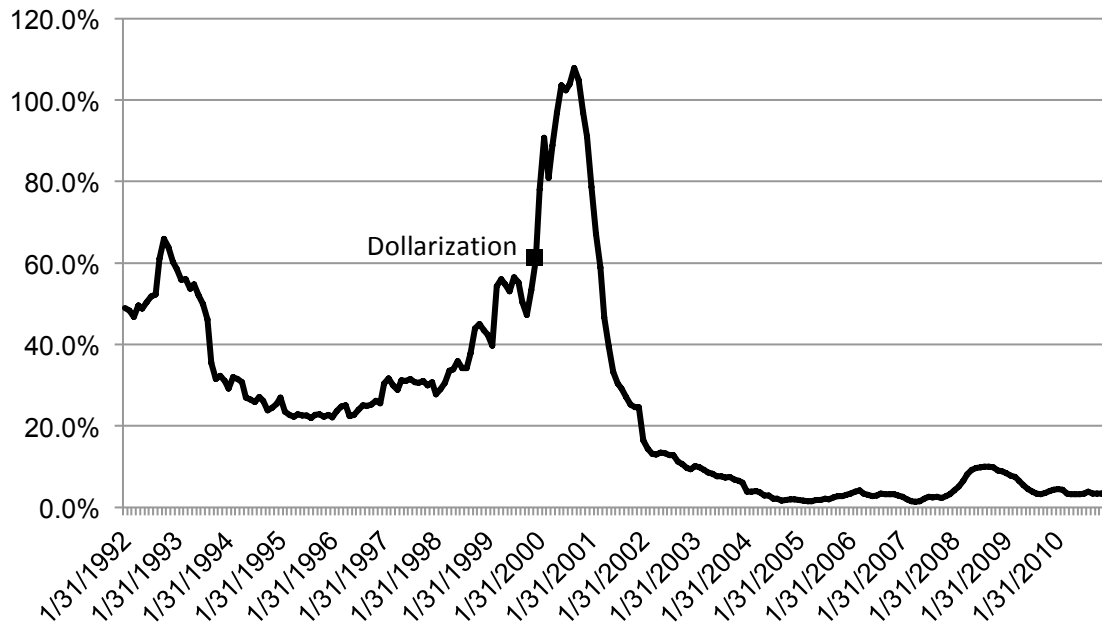
⁹⁷Cueva, Albornoz, and Avellán, "Ecuador: Binding Constraints to Growth."

⁹⁸Jose Antonio Lucero, "Crisis and Contention in Ecuador," *Journal of Democracy* 12, no. 2 (2001): 59-73.

⁹⁹Jolle Demmers, Alex E. Fernández Jilberto, and Barbara Hogenboom, *Miraculous Metamorphoses: The Neoliberalization of Latin American Populism* (Zed Books, 2001).

the crises. Informal employees, however, were hit much harder. Many such employees did not have access to financial institutions, and as such resorted to cash reserves that were devalued substantially.

Figure 11: Rate of Inflation in Ecuador, 1992-2010



Source: Central Bank of Ecuador, April 8, 2010
(Produced by author)

The 2000s: Statist Backlash Against Market Reforms

Many cite the Latin American New Leftist regimes in Venezuela (Chávez), Ecuador (Correa), Bolivia (Morales), Brazil (Lula) and Argentina (Kirchner) as challengers of neoliberalism. It is true that all of these regimes verbally lambast neoliberal policy, but they never challenged economic liberalism as a whole the way that ISI policy did in the 1980s. Lula and Kirchner introduced regulations and other reforms that they felt would make the market operate better, not eliminate it. Chávez, Correa, and Morales also speak out against neoliberalism, but have never challenged the importance

of global capitalism. In fact, each of these regimes relies on the international market for the majority of their countries' (and governments') economic welfare vis-à-vis commodity exports. Rather than temper this external reliance, these administrations are determined to take advantage of global markets to export their way to development. In other words, rather than removing themselves from the game of global capitalism, they choose to play with the intention of "winning" development.

Rafael Correa was elected in 2006 on a campaign that denounced neoliberal market reform. He is the first statist president in over 15 years, though he is undoubtedly still a populist. Correa is the first Ecuadorian president to win reelection in over 15 years, but he still struggles with the fragmented parliament typical of populist regimes. Correa also does not represent a departure from the focus on top-down solutions to underdevelopment that have dominated Ecuadorian politics for the past several decades. What is it that he and other Ecuadorian leaders are missing?

The "Free" Market and its Institutions

Highly educated economists trained in the United States or Europe were the ones who introduced the idea of market reform, so one might have expected them to predict some of these consequences. Even if these consequences and the leftist backlash of the 2000s do not specifically rebuke market reforms, they certainly rebuke Western hubris in assuming that market reforms would always bring positive outcomes regardless of politics, implementation, history, and culture. Franklin Maiguashca argues that this assumption is responsible for the failure of neoliberalism in Ecuador during the 1990s. Markets are not, as they are conceptualized in Ecuador, part of the country's "bounty of nature" that must simply be released. Rather, "The market is a set of social institutions

and learned behaviors that humanity has designed, developed, modified, and adapted, first in the Western Hemisphere, much later but with a vengeance in the Eastern Hemisphere, and recently in the world at large...[It] is one of the most ingenious social instruments ever devised by man for economic affairs, but it needs to be created, nourished, and developed by society at large.”¹⁰⁰ Myths about the nature of the market play a large role in the failure of reforms the government has attempted in Ecuador.

The largest myth is that removing the state from the economy means that the state will automatically be replaced by the market. This assumption might be correct in societies that have already developed a strong market culture supported by market institutions, but cannot be applied to societies that do not have such stability. Many cultures are not compatible with Western markets; the competitive individualism upon which capitalist markets are based is Western in origin. Culture can change and people can learn such behavior, but it will not happen with the simple removal of the state. On the contrary, the state is of even greater importance in non-Western societies that wish to implement market reform, for it is the state’s role to guide the transition. In the absence of market institutionalization and state guidance, crony capitalism begins to develop, characterized by drastic inequality between the few who were fortunate enough to be indoctrinated in the new ways of the market and the rest who serve as their economic prey. Those at the top have a disincentive to empower the populace, and those that try rarely understand how to do so. This is because, at the most basic level, a culture shift is necessary to achieve true market reform. Even achieving equal access to markets is irrelevant if the layperson is culturally unlikely to take advantage of such access.

¹⁰⁰Franklin E. Maiguashca G., “The Role of State and Market in the Economic Development of Ecuador,” *Journal of Economic Issues* 27, no. 2 (June 1, 1993): 441-450.

This type of crony capitalism has more commonly developed with the pursuit of market reform in several African countries, where cultures are arguably both more incompatible with Western capitalism and less politically institutionalized than elsewhere. As Daniel Tetteh Osabu-Kle notes, “The Somali clan system thus lacks the principle of individual culpability or rights, and the basic tenet of liberal democracy stressing individualism, therefore, does not hold.”¹⁰¹ However, Ecuador also provides a classic example of this scenario—perhaps the best in Latin America. Merilee Grindle and Francisco Thoumi see evidence for this emergence of crony capitalism in their finding that a large proportion of important economic transactions take place between individuals with different levels of power and status.¹⁰² It appears that for the “magic” of the market to work, market culture must first develop, a hallmark of which is a vibrant private sector. There are many parallels to be drawn with the development of consolidated democracy; for the magic of democracy to work, a civic society must develop characterized by strong political institutions. This is to say that neither system is a magical solution in reality; they are each subject to cultural forces and would require careful planning to be implemented outside of the cultural context within which they developed.

Framing Western democracy and free markets as “natural” removes them from their cultural context and only serves to obfuscate the reality of what their advocates are attempting to accomplish. It is essential to recognize that development is cultural. This recognition certainly opens debate about the morality of development, but such debate is

¹⁰¹ Daniel Tetteh Osabu-Kle, *Compatible Cultural Democracy: The Key to Development in Africa* (University of Toronto Press, 2000).

¹⁰² Merilee S. Grindle and Francisco Thoumi, “Muddling Towards Adjustment: The Political Economy of Economic Policy Change in Ecuador,” in *Political and economic interactions in economic policy reform: evidence from eight countries*, by Robert H. Bates and Anne O. Krueger (Blackwell, 1993).

necessary to the healthy progression of real development. If a people decide that what they want is democracy and free markets from the bottom up, then they will be far more likely to make the necessary shifts in behavior to accommodate them. Unfortunately, this type of transition is rarely seen in the modern world.

It must be said that top-down imposition of democracy and free markets has strong supporters and may enjoy success given specific circumstances. The idea behind those economists who acknowledge that markets are socially constructed and culturally dependant but still attempt to implement them in countries with very different cultures is that if a country is able to implement orthodox market reforms for a long enough period of time—a feat that may be linked to the strength of its political institutions—it may gain market culture over time. Javier Corrales notes of economic reforms, “There may be a certain threshold of economic freedom after which the reforms become deeply consolidated, maybe even widely supported by the political system, and thus resilient to external shock.”¹⁰³ In the political realm, Amartya Sen asserts that the imposition of the forms of democracy on a society will eventually create the civic society needed to transition to consolidated, liberal democracy, as in the case of India.¹⁰⁴ In other words, if a country with no history of markets and democracy is able to implement and maintain such structures, the underlying social construction may come with time. Again, though, this approach presupposes strong institutions to maintain carefully developed reforms over time. As we have seen in Ecuador, already-fragmented political systems often produce poorly designed reform policy that simply reinforces such fragmentation.

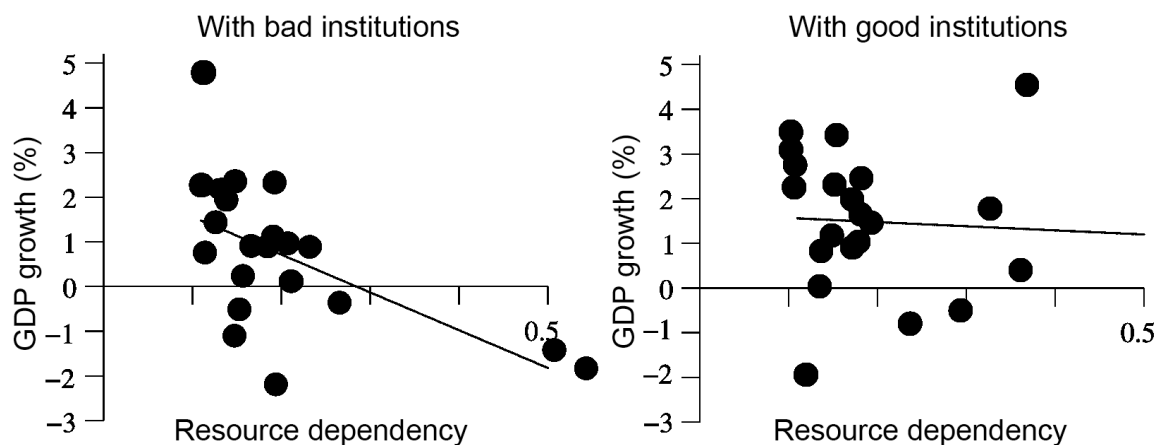
¹⁰³Corrales, “The Backlash against Market Reforms in Latin America in the 2000s,” 64.

¹⁰⁴Amartya Sen, “Democracy as a Universal Value,” in *Democracy: A Reader*, by Larry Diamond and Marc F. Plattner (Johns Hopkins University Press, 2009).

Rentier State Theory

Ecuador is different from other Latin American countries in many notable ways. The population is deeply culturally and ethnically divided, which makes democratic consolidation far more difficult. On top of this disadvantage, Ecuador is a “rentier” state, meaning that it derives a significant portion of its revenue from rents of domestic resources to foreign buyers. Rentier states are generally the same resource-abundant states that display the resource curse. As discussed in Chapter 1, political economists have placed blame for the resource curse on many factors, including the Dutch disease and bad economic policy choices, which shift investment away from human capital and toward resource extraction.

Figure 12: Average Yearly Economic Growth versus Resource Abundance, Countries with Resource Exports More than 10% of GDP, 1965 to 1990



Source: Reproduced from Mehlum et al. (2006)

It is important to note, however, that there is growing evidence that resource abundance explains economic underdevelopment only in countries lacking political institutionalization. That is to say, it is not natural resources that impede development in rentier states; it is a lack of good governance. In resource-abundant countries that have

highly developed political and market institutions (i.e. Norway) that require the state to manage the export industry responsibly, we do not observe the resource curse.¹⁰⁵ Lack of institutionalization in the resource-abundant countries of the South explains the appearance of the resource curse there (Figure 12). In the absence of institutions, we see conflict over resource rent distribution rather than economic development.¹⁰⁶ Halvor Mehlum finds: “Countries with institutions that promote accountability and state competence will tend to benefit from resource booms since these institutions ameliorate the perverse political incentives that such booms create. Countries without such institutions however may suffer from a *resource curse*.”¹⁰⁷

The proponents of rentier state theory assert that the relationship between institutionalization and resource abundance is not unidirectional. Not only does lack of political institutionalization in rentier states lead to the resource curse, but resource-abundant states are also less likely to develop institutionalization in the first place, especially with the introduction of free markets. Resource rents have a coercive effect on political actors. Michael Ross states, “resource rents lead to irrational exuberance, producing a ‘get-rich-quick mentality’ among businessmen and a ‘boom-and-bust’ psychology among policymakers, marked by bouts of excessive optimism and frantic retrenchments.”¹⁰⁸ Resource rents provide a source of revenue to the state that is independent of the electorate’s control. Populists inefficiently over-extract resources since have no incentive to conserve them; they drastically discount the future when they

¹⁰⁵ The dense trade union movement in Norway is evidence of high institutionalization.

¹⁰⁶ Halvor Mehlum, Karl Moene, and Ragnar Torvik, “Institutions and the Resource Curse,” *The Economic Journal* 116, no. 508 (January 2006): 1-20.

¹⁰⁷ James A. Robinson, Ragnar Torvik, and Thierry Verdier, “Political foundations of the resource curse,” *Journal of Development Economics* 79, no. 2 (April 2006): 450.

¹⁰⁸ Ross, “The Political Economy of the Resource Curse.”

may lose control of the state. Moves toward institutional, accountable democracy would subject the state to the electorate's control, creating a disincentive for democratization.¹⁰⁹ The degree of exposure of politically weak, resource-abundant rentier states to free markets also affects development outcomes. Weyland argues that leaders in rentier states have incentives not to implement effective market reforms as this could impede the state's role in resource extraction.¹¹⁰ The establishment of a healthy private sector would introduce competition for rents.

How, then, does a state combat this type of toxic incentive structure? This is exactly the problem: a *state* cannot. Foreign states are subject to the same incentives as is the domestic state. Thus, challenging this incentive structure is something that must come from the citizenry. However, such a process would require the type of powerful citizenry commonly seen in the institutionalized democracies of countries in the global North. I have already asserted that one reason why Ecuador's populace is disempowered is that the state has an incentive to keep it that way in order to continue collecting its rents with impunity. However, political and economic institutionalization goes deeper; it is cultural. If a cultural shift toward institutionalization and accountability took place, the government would have to respond. To determine how such a cultural shift might take place, we must look to the history of these socially constructed systems. What type of culture produced them?

¹⁰⁹Robinson, Torvik, and Verdier, "Political foundations of the resource curse."

¹¹⁰Weyland, "The Rise of Latin America's Two Lefts."

The Co-Evolution of Democracy and Free Market Capitalism

Democracy and markets are socially-constructed political and economic systems. Economists and politicians use the term “development” widely to refer to moving poor countries from economically destitute autocracy to freedom and prosperity. However, they rarely define “development” in a specific sense. Does it mean solely economic growth and for whom? Does it mean social change of some kind? Does it mean different things in different countries? How were these systems invented? How can they be created in the future?

The modern concepts of liberal democracy and capitalism are intertwined and share a common history rooted in the development of the United States. North America provided a new environment in which rugged individualism and a belief in natural, God-granted rights flourished. A uniquely American ideology of individualism grew out of this environment, and its political and economic repercussions were responsible for the separation of America from its European roots. This ideology eventually gave rise to democracy and capitalism as we know them today. The most distinguishing characteristic of the North American environment that engendered this ideology was the perception of “free” land throughout North America. The culture of individualism associated with private domestic ownership of land played an important role in the creation of liberal democracy and capitalism as ideologies.

“Free” Land

Though North America was already inhabited by Native Americans when the Europeans arrived, their populations were sparser than in South America and the Europeans had devastatingly effective war technology. Many Native American groups

also lacked the same concept of property rights that Europeans understand. The Europeans were thereby able to conceptualize North America as “free” land that was virtually unlimited. During the formative years of the United States, this conceptualization had a profound impact on American political thought. While dense populations and scarce resources defined Europe, America offered vast open spaces. The “free” land of the frontier allowed principles of individualism and self-determination to flourish in a way that they never could in crowded Europe. The frontier captured the cultural consciousness of the newly forming American people. In addition to a national identity, the frontier also decreased the Americans’ dependence on Europe and enabled it to cut itself away from all of its flaws. The influence of the frontier went to the most basic social level; when transplanted into the American wilderness, the complex societies of Europe dissolved into primitive units organized around the family. The result was a fiercely individual, anti-social American that feared control.¹¹¹

This individualistic American gave birth to the brand of democracy and capitalism that has spread throughout the modern world.¹¹² The fact that most Americans were able to have their own plot of land meant that they were all politically and economically invested in their new country. Free land gave American men something to defend in the political process as well as the means by which to produce goods for economic gain.¹¹³ These goods faced less competition than they would now due to the inherent protection offered by geography—Americans had the fortune to be isolated by

¹¹¹Frederick Jackson Turner, *The Frontier in American History* (Mineola: Courier Dover Publications, 1996).

¹¹² I acknowledge that Turner has been widely disputed, but find that his conceptual framework is useful for understanding the thinking of the time that still has vestiges in today’s culture.

¹¹³ At the time, only men could own land and run for political office; it was in this male-dominated environment that democracy and capitalism were born.

two great oceans. They were therefore able to establish positions in the new market with great ease relative to the difficulty of such activities in modern times.¹¹⁴

The North American Narrative

The narrative that Americans tell about their country's development, however, does not acknowledge its unique circumstances. The way many neoliberal economists speak, one would never think that the U.S. developed in a highly protected, isolated context. One would believe that the global capitalist market with unrestricted free trade is a feature of nature that has always existed rather than something Americans created. The self-deception of the American development narrative would not be so important if it did not have highly relevant implications for the global South today. America preaches that free markets are the key to development, when it developed in one of the most protected settings in history.¹¹⁵ As previously discussed, this self-deception allows U.S. leaders to pursue specific policy in foreign countries that serve its own interests while validating such efforts as part of America's own history.¹¹⁶

Even if it were accurate, the idea of a unilinear, universally-applicable narrative of development is dangerously close to the philosophy of European colonialism, which employed the term "uncivilized" to describe other cultures that Europeans felt were behind Europe on some unilinear path of civilization. Assuming that countries in the global South are simply further behind on some unilinear path, however, ignores the

¹¹⁴ Despite the fact that free land is no longer a reality, America remains ideologically in the frontier. Failing to acknowledge the loss of a key underpinning of the American ideology has the result that, as Turner put it, "American energy will continually demand a wider field for its exercise."

¹¹⁵ Patricia Nelson Limerick, *The Legacy of Conquest: The Unbroken Past of the American West* (W. W. Norton & Company, 1988).

¹¹⁶ We already know from the experience of ISI, however, that simple protectionism is not the universal solution to underdevelopment as it does not address the incentive structure created by resource abundance in a rentier state.

historical context in which liberalism emerged in the United States. In reality, the free land that America supposedly possessed never really existed, and certainly does not exist anywhere else in the world. In assuming that there is a single path to “development,” we are willfully ignoring the complexities that would inform the creation of new paths suited to the unique history, demography and geography of different countries.

Development economists should be probing these complexities rather than proselytizing models based on inaccurate assumptions. How can one create a culture of individualism outside of the North American context? The American individualist ideology did spread to many countries in which free land and free security were absent and became integrated into political and economic systems either by reform or revolution. In the absence of free land, land redistribution was central to this process.¹¹⁷ Could it be that land is the key to a culture of individualism?

Grassroots Development

Though there is no one path to “development,” the American story does reveal what may be a universal truth: effective democracy and capitalism start at the grassroots level. They were not forced on the American population by any foreign state or domestic government. In Europe, democracy developed as citizens slowly stood up and demanded democratic governance.¹¹⁸ These grassroots efforts rose out of growing cultures of individualism. In the American story, granting private property to every citizen created this culture of individualism. Is the individualism that comes with land ownership

¹¹⁷ Two notable examples are Japan (Land Tax Reform of 1873) and France (the French Revolution).

¹¹⁸ It is important to reinforce that it is only logical that the development of these socially-constructed systems should start at the social level to those who acknowledge that these systems are socially-constructed and not simply part of nature.

necessary for political and economic institutionalization? This question is important to puzzle out, because while free land is not a reality for Ecuador or for any country, land reform is possible.

In Ecuador, none of the state's various macroeconomic regimes have reduced inequality or led to the political and economic institutionalization that would signify a move away from underdevelopment. The efforts of foreign states and international institutions have also seen no such results. This is unsurprising, as the combined incentives created by resource abundance and the global economic system create no interest or ability among domestic and international policymakers and scholars to overcome the resource curse. Real solutions will come from the grassroots level up rather than from the top down, and the Ecuadorian state should be looking to its smallholders for inspiration rather than to foreigners.

Conclusion

Free markets have been the subject of intense debate in Latin America during the last several decades, focusing on the conflict between market reforms and statist protectionism. After the apparent failure of protectionist ISI policy, Latin American countries began to implement neoliberal market reforms, opening up markets to foreign investment and interference. Many saw these reforms as the new trend for Latin America, moving away from the region's statist past. Nevertheless, the 2000s saw an intense backlash against market reforms in the rise of the often-statist New Left after neoliberal policies only further worsened inequality and underdevelopment. The current New Leftist regimes have also failed to alleviate Ecuador's plight. This is because this theoretical policy debates that created all of these regimes took place overseas and fail to

account for Ecuador's culture and ecology. Ecuador does not have the same type of individualistic culture as does the United States, and its resource abundance exerts a powerful disincentive to accomplish political and economic institutionalization.

Therefore, in order to understand underdevelopment in Ecuador, we must move beyond the debate of markets versus state and recognize that the real story lies elsewhere.

Indian Environmental Activist Vandana Shiva once famously observed, "As usual, in every scheme that worsens the position of the poor, it is the poor who are invoked as beneficiaries."¹¹⁹ To date it has been high profile economists and political leaders in Northern countries like the United States that have created the macroeconomic theory that gets exported to countries like Ecuador. Not only does this give such countries in the global North an avenue by which to exert influence over countries in the global South in order to accomplish goals of their own—such as securing natural resource exports for themselves—but even with the best of intentions it simply will not work. Policy makers in classrooms and boardrooms thousands of miles from Ecuador's vibrantly unique cultures and ecosystems can never hope to know what is best for them, much less how to accomplish it.

Resource abundance creates very real incentives for domestic leaders in countries like Ecuador. These incentives affect foreign policy theorists just as strongly, but they do not affect the average citizen who simply wishes to make a living nearly as much. Ecuador possesses an incredible wealth of human potential. Its peoples are socially and culturally diverse and economically innovative. It is time for Ecuador to look inwards at the vast wealth that it possesses: not the oil, not the bananas, but the *people*.

¹¹⁹ Vandana Shiva, *Staying Alive: Women, Ecology, and Development* (Zed Books, 1988).

Chapter 3

The Smallholder: Market Investiture, Political Institutionalization, and Environmental Stewardship

*“We abuse land because we regard it as a commodity belonging to us.
When we see land as a community to which we belong, we may begin to
use it with love and respect.”*

– Aldo Leopold
A Sand County Almanac

I have demonstrated that resource abundance can induce rent-seeking behavior in countries with uninstitutionalized political and economic systems. Windfall profits from valuable exports provide a steady stream of government revenue that is independent of the control of the country’s populace. The export commodity is therefore what is most important to the government; there is no incentive for economic diversification or the strengthening of the private sector. Rather than the population supplying wealth to the government, the government supplies wealth to its people. I have also asserted the active role that the global North and the global economic system play in reinforcing this incentive structure in order to maintain access to resources. The resource curse flows from the role reversal of rentier states and their peoples that is perpetuated by international actors.

In looking for solutions to the resource curse, the macroeconomic realm has proven ineffective at best and destructive at worst. Healthy democratic societies and market systems come about after citizens demand them, not in spite of citizens. There is no shortage of entrepreneurial spirit in Ecuador. On the contrary, the self-employed or informal sector is one of the largest, and is far larger than in any country in the global North. As Ha-Joon Chang observed, “People who live in poor countries have to be very

entrepreneurial to survive.”¹²⁰ The informal or self-employed sector composes 8.8 percent of employment in the U.S. and 34.4 percent of employment in Ecuador.¹²¹ America as the land of entrepreneurialism is another component of its false narrative of development; according to the statistics, “land of the desk job” might be more appropriate when compared with a country such as Ecuador.

Rather than spirit, what is missing are the tools and starting capital (i.e. land) that would grant citizens a foothold by which to empower themselves socially, politically and economically. The paths out of underdevelopment may be different for other countries, but what will likely be the same is that they will be led by the people, and land reform is an important way to empower people. The story of the Hacienda Santa Cecilia provides many insights into the process by which this occurs. It also demonstrates that many of the same factors responsible for the neglect of human capital in Ecuador are also responsible for the destruction of natural capital, and that land reform is a remedy to this problem as well.

Despite the conditions that have prevented many of their peers from doing the same, Glenda Muguerza and Don Freddy García have created an ecologically-sustainable, economically-profitable farm that produces a diversified portfolio of products. How can the Hacienda inform our understanding of how to fight the resource curse from the ground up?

In this chapter, I detail the success of Hacienda Santa Cecilia. Don Freddy’s and Glenda’s innovation came when they began to understand their symbiotic relationship

¹²⁰ Ha-Joon Chang, *23 Things They Don’t Tell You About Capitalism* (Bloomsbury Publishing USA, 2011).

¹²¹ Friedrich Schneider, “Size and Measurement of the Informal Economy in 110 Countries,” *World Bank, Understanding Regulation*, Oxford University Press (2004).

with their land; thus, I begin by outlining Don Freddy's and Glenda's environmental stewardship, i.e., silvopasture agroforestry and intercropping. I analyze the ways in which these practices have both environmentally benefited the living community that is Hacienda Santa Cecilia as well as the García Muguerza pocketbooks. Finally, I use these observations to reassert the importance of smallholder ownership in empowering individuals to overcome underdevelopment and the resource curse.

Environmental Stewardship

Don Freddy García's father obtained the land for the Hacienda Santa Cecilia during the land reforms of the 1960s. Don Freddy was born at the Hacienda and he remembers when the land used to be forested. Glenda Muguerza was born on a neighboring farm, and like Don Freddy, she witnessed the change as more and more people began ranching over the years. They saw the system become "modernized," meaning dependent on clear-cutting. Government experts all advised that the way to conduct grazing was in open pastureland. Like nearly all other farms in the area, the Hacienda became dominated by pastureland and stripped of trees. Don Freddy and Glenda saw environmental problems such as erosion, flooding, and drought, increase rapidly and impact livelihoods. Though many in their generation moved to the cities to look for work due to the resulting economic hardship in Chone, they stayed. They got married, and helped Don Freddy's father manage the Hacienda. Having spent their whole lives in the area, they understood the land and the changes that had taken place

over time in a way that the older generation could not. They began to wonder if there was a link between deforestation and the environmental problems that ensued.¹²²

Don Freddy's father was able to retire in the year 2000, and Don Freddy and Glenda began to manage the land. It was around this time that they decided to experiment with reforesting the hacienda. As pioneers with very limited financial resources, they say that it was difficult to get the necessary materials, dedicate time for planting trees, and to leave the pastures alone for at least a year while trees grew. However, over the last ten years, they successfully reforested 40 hectares of pastureland. This land is what they call "silvopasture," and it is a type of mixed-use agroforestry system that has proven highly productive. In recent years, they have also begun experimenting with intercropping on their land, which has increased both biodiversity and productivity. They have set an example in the area, and some are now beginning following their lead.¹²³

Silvopasture Agroforestry

A silvopastoral system is one in which grazing pasture is intermingled with trees, benefiting both the local ecosystem and grazing productivity when compared with open pasture in several ways that I will discuss in detail. Many different trees can be used in a silvopastoral system, but generally trees that allow a sufficient amount of sunlight for grasses to grow underneath are preferable. At the Hacienda Santa Cecilia, the most common trees in use are pachaco and algarrobo (Table 3).¹²⁴

¹²² Glenda Muguerza, Interview, April 12, 2010.

¹²³ García, Interview.

¹²⁴ Ibid.

Table 3: Tree Type Ranked by Use at Hacienda Santa Cecilia

Rank	Tree	Quantity
1	Pachaco (<i>Schizolobium parahybum</i>)	30,000
2	Algarrobo (<i>Prosopis cf. pallida</i>)	10,000
3	Pela caballo (<i>Leucaena cf. trichodes</i>)	5,000
4	Samango (<i>Samanea cf. saman</i>)	2,000
5	Guarango (<i>Caesalpinia spinosa</i>)	300
6	Guasmo (<i>Guazuma ulmifolia</i>)	300
7	Guachapelí (<i>Albizia guachapele</i>)	100
8	Cedar (<i>Cedrela odorata</i>)	50
Total		47,750

Source: Interview with Don Freddy García, April 16, 2010

Many of the best trees for silvopastoral use are leguminous. Legumes are plants of the family *Fabaceae* that maintain a symbiotic relationship with a type of bacteria called “rhizobia” in their roots. Rhizobia are able to fix atmospheric nitrogen (N_2); that is, they convert it to ammonia (NH_3), which the plant is then able to use. Nitrogen is fundamentally important for plant and animal life because it is required to build nucleotides for genetic material and amino acids for protein. Due to their symbiotic relationship, legumes and rhizobia are able to flourish in soil that is nitrogen-deficient. This makes them highly valuable for reforesting land that has been exhausted of nutrients by years of use as grassy pastureland. Legumes drastically reduce the need to purchase chemical fertilizers, and they also introduce a large amount of biomass into the ecosystem that can be synthesized by other organisms.¹²⁵

Pachaco produces slightly too much shade, but it is leguminous (Figure 13). It is very good at capturing moisture, and thus is able to change dry environments into moist ones. Algarrobo is an ideal tree for silvopasture. It allows a good amount of light

¹²⁵ Julie Cullimore and Jean Dénarié, “How Legumes Select Their Sweet Talking Symbionts,” *Science* 302, no. 5645 (October 24, 2003): 575 -578.

through its branches, is leguminous, produces a great deal of cattle feed in the form of seedpods, has medicinal benefits for humans, and can be used as lumber. Guachapelí is also a good silvopastoral tree as it is leguminous, lets light through, and can be used as lumber as well. Guarango produces slightly too much shade, as does huasmo. Huasmo is leguminous, though it is also very aggressive in its growth. Samango produces good lumber, but does not let enough light through; the same is true for cedar.¹²⁶

Figure 13: Pachaco Silvopasture at Hacienda Santa Cecilia



Source: Photograph by author, April 16, 2010

There are several ways of establishing a silvopastoral system from a deforested tract of land in coastal Ecuador. One must plant in December, due to the fact that workers are tied up planting corn in January, since that is the beginning of the wet season. Planting involves digging holes and lining them with absorbent gel and an initial dose

¹²⁶Alonso García, Interview, April 21, 2010.

fertilizer. The absorbent retains the fertilizer and as well as moisture for the tree during the month of December before the rains start. This is especially important given that most land being reforested is depleted from years spent as open pasture. Absorbent can maintain moisture in the ground for periods of up to a month at a time without rain, and thereby greatly reduces the need for artificial irrigation. It lasts for 10 years, after which time it is unnecessary as the trees have matured enough to retain water on their own. The saplings must be fertilized again in April, and trimmed so that they grow straight and tall with no low-hanging branches to hinder cattle movement. Cattle cannot be permitted onto the land for the first 1.5 years, as they will trample or eat the saplings.¹²⁷

After 1.5 years (or after the trees are over 2 meters in height) cattle may graze without destroying the trees. Different species can be planted at different spatial increments; for example, algarrobo is generally planted at about 100 trees per hectare. Depending on the species, thinning might also be necessary; algarrobo is thinned by half after 10 years, and half again after 15 years, leaving 25 trees per hectare (5-by-5) at a spacing of 20 meters each, and providing a small lumber income. The system eventually becomes self-sustaining, with new seedlings sprouting from naturally fallen seeds. While this is the method employed at Hacienda Santa Cecilia, it is possible to devise many other ways of establishing silvopastoral systems, including more organic approaches (i.e., without any chemical fertilizer).¹²⁸

¹²⁷ Don Freddy García, Interview, April 24, 2010.

¹²⁸ García, Interview.

Figure 14: Silvopasture Seedlings at Toni Corporation Distribution Center



Source: Photograph by author, on April 21, 2010

Hacienda Santa Cecilia was one of the first to implement the silvopastoral system in the Chone area, but others are beginning to follow with much variation in method. Even large businesses have picked up on the productivity benefits of silvopasture, which I detail in the next section. For example, Industriales Lácteas Toni S.A., a major milk corporation in Ecuador, has recently instituted a silvopastoral program. Toni gets the majority of its milk from smallholder suppliers, and has taken the philosophy that what is best for their farmers and their land is best for the corporation. The pilot program in 2008 planted 96,000 trees on 5 of Toni's suppliers' farms, and the program will plant an estimated 500,000 trees in 2010 across nearly all of their suppliers' farms (Figure 14).¹²⁹

¹²⁹García, Interview.

Increased Pasture Growth

The silvopastoral system increases pasture growth immensely (Figure 15). Because the ground is not exposed to full sun, it maintains a higher level of moisture and remains soft, making it much easier for grasses to grow. In traditional open pastureland, the ground dries out—especially during the dry season—and becomes hard, so that moisture cannot sink in. As a result, rainwater flows rapidly over the surface, causing large-scale flooding. Not only do trees soften the ground and maintain moisture, but they also cycle nutrients from the subsoil. In open pastureland, grasses quickly deplete the nutrients available in the topsoil, which is typically all that their roots are able to access. Trees, however, tap into nutrients far deeper into the subsoil, replenishing topsoil with fallen leaves, branches, and seeds. If they are legumes, they also introduce nitrogen into the ecosystem. The presence of trees also results in a higher level of biodiversity in the ecosystem as a whole, as other plant and animal life finds forested land a far more suitable habitat than barren pastureland.¹³⁰

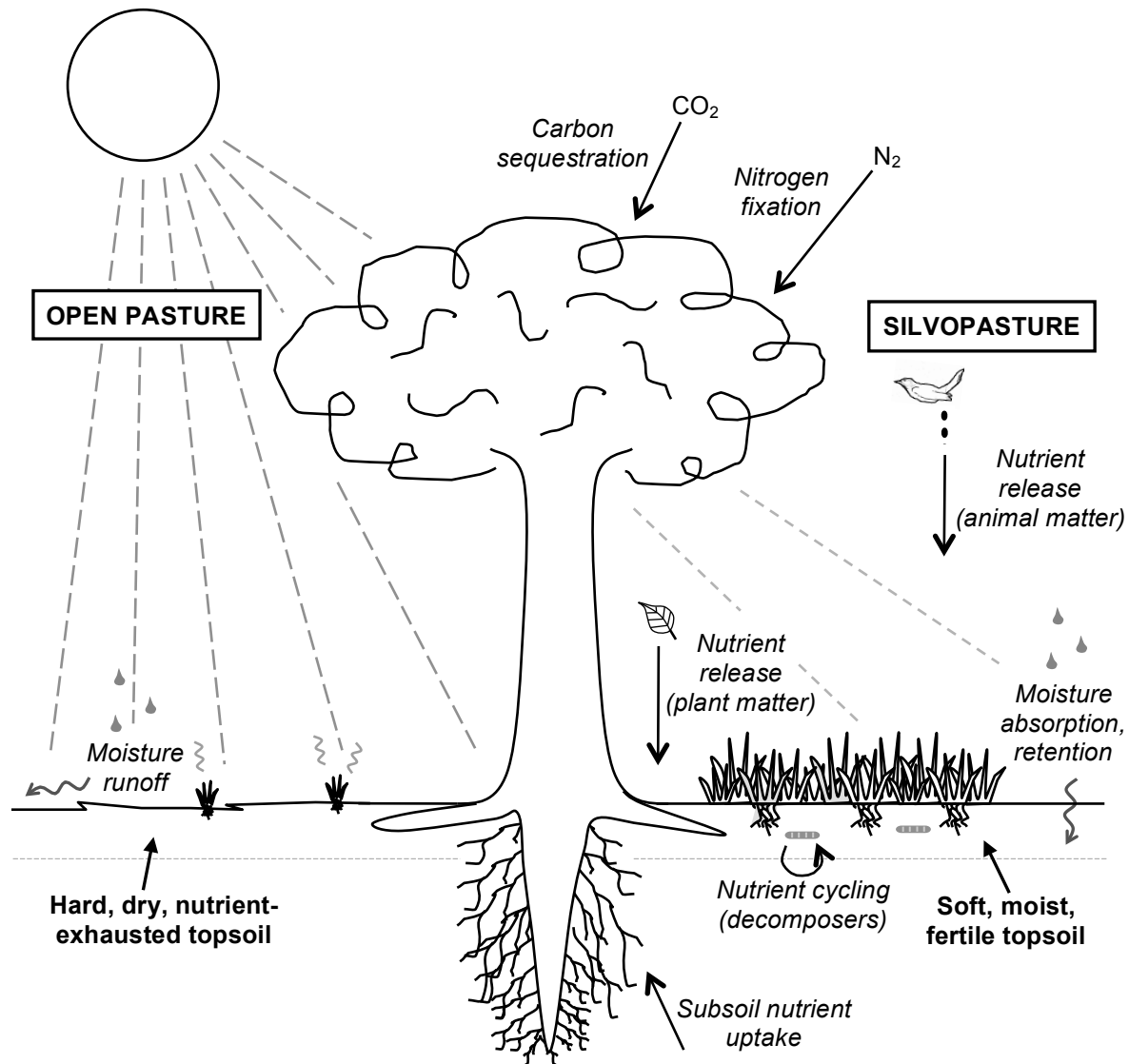
The introduction of other flora and fauna make for a more stable ecosystem, and provide benefits to the growth of pasture. Birds, taking advantage of the habitat provided by the trees, fertilize the soil and eat insects that could potentially harm pasture grasses. Worms, able to live in the moist, soft soil, recycle nutrients and help maintain healthier topsoil. Environmentally, providing tree habitats is invaluable to preserving and revitalizing the high levels of species endemism local areas.¹³¹ Finally, increased pasture

¹³⁰Ibid.; M Ibrahim et al., “Sistemas Silvopastoriles en América Central: Experiencias de CATIE” (Fundación CIPAV, 1999).

¹³¹García, Interview.; J Beer et al., “Servicios ambientales de los sistemas agroforestales,” *Agroforesteria en Las Américas* 10, no. 37-28 (2003): 80-87.

growth allows for more food for cattle, enabling some of the increases in productivity detailed in the next section.

Figure 15: The Silvopastoral System



Source: Interview with Alonso García, April 21, 2010
(Produced by author)

Increase in Cattle Productivity

Of utmost importance to farmers, productivity rises considerably in a silvopastoral system. Cattle need shade and simply cannot be in the equatorial sun all

day. In traditional open grazing systems, cattle spend an estimated 6 hours—from 10:00 a.m. until 4:00 p.m.—not grazing in pastures each day due to risk of sun overexposure.

Figure 16: Cattle Crowding in Shade at the Farm of Eva Bowen



Source: Photograph by author, April 14, 2010

Instead, the cattle waste energy searching for shade, which generally involves a long walk across open pastures that are normally very large and completely cleared of trees. Once cattle find shade, nearby areas are generally already cleared of anything edible, so the majority of the cow's day is spent not grazing, resulting in decreased milk and meat production (Figure 16). While traditional open pastures support approximately 1 cow for every 2 hectares and produce 3 liters of milk per cow per day, the Toni Corporation

estimates that silvopastoral systems can maintain 3 cows per hectare, producing 5 liters of milk per cow per day.¹³² This represents a *tenfold* increase in milk productivity.

Flood and Drought Prevention

Because the silvopastoral system yields soil much more able to absorb water, both flooding and drought are reduced dramatically. This can be a real benefit to farmers, as recent years have seen animals die as a result of flooding and drought. Flooding and drought are increasing problems in the deforested Costa.¹³³ Floods in 2008 caused an estimated grazing revenue loss of \$741,355.00 for Chone Canton (Table 4).¹³⁴

Table 4: Estimated Economic Losses Following the 2008 Floods in Chone Canton

Animals	Affected Animals	Animals Lost	Economic Lossⁱ
Cattle	99,449	2,213	\$741,355.00
Pigs	22,925	2,212	\$292,868.80
Horses	23,161	252	
Poultry	65,020	9,398	\$38,108.89
Total	210,555	14,075	\$1,072,332.69

ⁱ Values estimated using 2008 prices
Source: MAGAP-SIGAGRO-SIA, 2008

Additionally, on hillside pastures, trees—and the grasses they help to grow—hold soil in place, greatly reducing hillside erosion, which has been responsible for the destruction of large amounts of pastureland. The 2008 flooding destroyed 2,281 hectares of pasture and damaged 87,586 hectares. Drought, which occurs more often than flooding, impacts the grazing sector even more. Though exact data was not available at

¹³²García, Interview.

¹³³“United Nations assists Ecuador following floods” (M2PressWIRE, 2006); “El ganado se enferma y baja producción de leche,” *El Diario* (Chone, Ecuador, 2008), <http://www.eldiario.com.ec/noticias-manabi-ecuador/70735-el-ganado-se-enferma-y-baja-produccion-de-leche/>.

¹³⁴“Sistema silvopastoril, experiencia de buena práctica de resiliencia en la cuenca media del río Chone.”

this writing, MAGAP officials estimate the 2009 drought losses to have surpassed flooding losses at a ratio of 6 to 1.¹³⁵

Figure 17: Open Pasture Flooding in Chone



Source: Photograph by author, April 16, 2010

Wood Sales and Feed

Silvopastoral systems that employ leguminous trees, such as pachaco, have the added benefit of providing seedpods as additional feed for cattle. Don Freddy estimates the cost of cattle feed avoided by both his pachaco silvopasture and yuca crop at \$50,000 per year. In addition, the Hacienda Santa Cecilia method of silvopasture requires

¹³⁵ Ministerio de Agricultura, Ganadería, Acuacultura y Pesca, Agency Visit, April 23, 2010.

thinning of the trees over time, which provides lumber to sell. Don Freddy estimates the annual wood sales revenue of Hacienda Santa Cecilia at \$5,000.¹³⁶

Ecotourism

Ecotourism is a possible indirect benefit to silvopastoral systems. Reforested areas make for beautiful hiking locations, and revenue from ecotourism can help offset the upfront cost of planting. Glenda already runs a weekend restaurant that draws about 300 local customers per weekend, which, at a price of \$3.00 per meal, grosses \$900.00 per weekend in revenue (Figure 18).

Figure 18: Ecotourism Dining Area at Hacienda Santa Cecilia



Source: Photograph by author, April 25, 2010

¹³⁶ Refer to Appendix D for complete budget.

Glenda and Don Freddy hope to construct pools and cabins to draw tourists from afar. Their proposed investment is \$50,000, and estimated price would be \$13.00 per person per stay (Table 5).¹³⁷ Given the proposed figures, it would take approximately 3,800 guests before breaking even.

Table 5: Ecotourism Proposal at Hacienda Santa Cecilia

Item	Investment	Revenue/Person/Visit
Dining Space	Sunk cost ⁱ	\$3.00
Pools	\$20,000	\$4.00
Cabins	\$30,000	\$6.00
Total	\$50,000	\$13.00

ⁱ Repurposed an old structure

Source: Interview with Don Freddy García, April 12, 2010

Payment for Environmental Services

Forested land provides very real benefits to the environment and other members of the local community. Carbon dioxide is a major greenhouse gas causing global climate change. Climate change is exacerbating the Costa's already unstable climate, which—compounded with the additional effects of deforestation already detailed—results in other severe environmental problems such as flooding and drought.¹³⁸ Reforestation helps abate problems associated with climate change, in that trees remove carbon from the atmosphere. This presents a benefit for the farmer, community, and world. Pachaco trees, for example, are estimated to absorb 1 to 1.5 tons of carbon during their lifetime, with a large amount of that sequestration taking place during the tree's initial growth.¹³⁹ Having trees present in pastureland also presents the specific benefit of direct methane absorption; methane produced by cattle has been shown to be a significant

¹³⁷Muguerza, Interview.

¹³⁸García, Interview.

¹³⁹Beer et al., "Servicios ambientales de los sistemas agroforestales."

contributor to global climate change.¹⁴⁰ On the local level, silvopastoral systems also greatly mitigate river sedimentation due to decreased erosion. River dredging has presented a large community cost in Chone each year, which silvopastoral systems avoid or reduce greatly (data unavailable at this writing).¹⁴¹

Under an environmental services payment scheme, the government would pay land owners the benefits their trees provide to the environment and community, such as carbon capture, biodiversity conservation, or river sedimentation mitigation. Such a system would have to quantify these benefits economically, and there would need to be a method of confirming that farms were continuing to provide environmental services. The Government of Ecuador has introduced a growing environmental services payment program called Socio Bosque. Unfortunately, however, the program has not taken off in Chone as of this writing. A similar program began following the Kyoto Protocol and was never able to gain ground in Ecuador due to difficulties associated with accountability and quantifying environmental services.¹⁴² With greater political institutionalization, such a program would likely function more effectively.¹⁴³

Intercropping

In recent years, Don Freddy and Glenda have begun experimenting in intercropping, which is the practice of intermingling crops of different species, thereby increasing the biodiversity of the system (Figure 19). When farmers use land for a single

¹⁴⁰García, Interview.; Liliana Mahecha, “El silvopastoreo: una alternativa de producción que disminuye el impacto ambiental de la ganadería bovina,” *Revista Colombiana de Ciencias Pecuarias* 15, no. 2 (2002).

¹⁴¹García, Interview.

¹⁴²Mosquera, Interview.

¹⁴³Sven Wunder, “The Efficiency of Payments for Environmental Services in Tropical Conservation,” *Conservation Biology* 21, no. 1 (2007): 48-58.

crop, it exhausts the soil of the nutrients that that crop requires. Planting multiple crops together increases the likelihood that one crop will provide some of the nutrients that another crop needs. One crop will often also retain water for another crop that is less able to do so. As with silvopasture, intercropping is highly variable and ecologically-dependent. Farmers may employ it in different ways, and some crop combinations are undoubtedly more effective than others. At the Hacienda Santa Cecilia, the process of experimentation has only just started. The most successful intercropping combination has been bananas and cacao as planting them together drastically reduces the need for artificial fertilizer, of which both crops would normally require large quantities (Figure 19).

Figure 19: Banana and Cacao Intercropping at Hacienda Santa Cecilia



Source: Photograph by author, April 16, 2010

Economic Success

The Hacienda is highly successful economically, generating \$120,023 in profit each year (Table 6).¹⁴⁴

Table 6: Hacienda Santa Cecilia Budget, 2010

Commodity	Gross Income/Year	Expenses/Year	Net Income/Year
Corn	\$50,400.00	\$39,540.00	\$10,860.00
Passion Fruit	\$72,000.00	\$44,100.00	\$27,900.00
Cacao	\$6,000.00	\$3,135.00	\$2,865.00
Papaya	\$4,800.00	\$4,124.00	\$676.00
Yuca	\$7,500.00	\$2,310.00	\$5,190.00
Plantain	\$4,500.00	\$2,586.00	\$1,914.00
Algarrobo Forest	\$50,000.00	\$0.00	\$50,000.00
Ranching	\$48,000.00	\$27,126.00	\$20,874.00
Total Net Income/Year			\$120,023.00

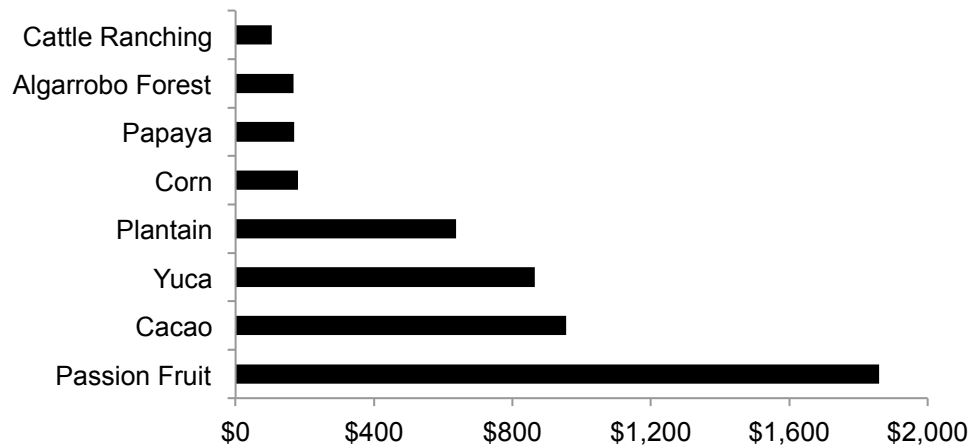
Source: Interview with Don Freddy García, April 24, 2010

Passion fruit is by far the most profitable crop, bringing in \$27,900 per year, or \$1,860 per hectare per year (Figure 20; Table 7). Corn is costly to produce: although the Hacienda employs 60 hectares in the growth of corn, the crop only brings in \$10,860 per year in total, or \$181 per hectare per year. Papaya is similarly costly to produce, while cacao and plantain enjoy larger profit margins. Algarrobo (*Prosopis cf. pallida*) is a leguminous tree, which produces seed pods that serve as cattle feed. Santa Cecilia has an estimated 10,000 algarrobo trees, which produce \$50,000 worth of feed that then does not need to be purchased. Yuca, as well, serves as cattle feed. Finally, cattle ranching produces approximately \$20,874 in profit each year. The yuca and algarrobo provides

¹⁴⁴García, Interview.

cattle feed. The only feed costs, therefore, are the costs of planting and maintaining these feed crops. Ranching is the least profitable activity per hectare.¹⁴⁵

Figure 20: Crops Ranked by Profitability per Hectare, 2010



Source: Interview with Don Freddy García, April 24, 2010

Table 7: Crops Ranked by Profitability per Hectare, 2010

Rank	Commodity	Net Income/Year	Hectares (Ha)	Net Income/Ha/Year
1	Passion Fruit	\$27,900.00	15	\$1,860.00
2	Cacao	\$2,865.00	3	\$955.00
3	Yuca	\$5,190.00	6	\$865.00
4	Plantain	\$1,914.00	3	\$638.00
5	Corn	\$10,860.00	60	\$181.00
6	Papaya	\$676.00	4	\$169.00
7	Algarrobo Forest	\$50,000.00	300	\$166.67
8	Cattle Ranching	\$20,874.00	199	\$104.89

Source: Interview with Don Freddy García, April 24, 2010

Smallholder farmers in Chone formed the Cooperativa de Producción Agropecuaria Chone Ltda., in order to communally process their goods after production, thereby cutting costs that can be prohibitive to small farmers. Additionally, some local

¹⁴⁵ Refer to Appendix D for complete budget.

agribusinesses operate by purchasing goods from small farmers, rather than operating their own plantations, with the notable exception of banana agribusiness.

Costs of Silvopasture Agroforestry

Planting

When starting from open pastureland, the principle costs of implementing silvopastoral systems are the cost of planting and the loss of grazing time while waiting for the trees to grow. For algarrobo, the tree currently used most at Santa Cecilia in new silvopasture, the cost of planting is \$232.00 per hectare (Table 8).¹⁴⁶

Table 8: Cost of Planting for Algarrobo

Material	Cost/Tree	Cost/Haⁱ
Seeds	\$0.20	\$20.00
Labor	\$1.40	\$140.00
Absorbent	\$0.22	\$22.00
Fertilizer	\$0.40	\$40.00
Pesticides	\$0.10	\$10.00
Total	\$2.32	\$232.00

ⁱCalculated for 100 trees per hectare

Source: Interview with Don Freddy García, April 24, 2010

The main costs associated with planting are seeds, labor, absorbent, fertilizer, and pesticides. The previously described planting process must be carefully followed because planted areas are generally recovering from years of open grazing. Planting costs for other tree species are similar to those of algarrobo.¹⁴⁷

¹⁴⁶García, Interview.

¹⁴⁷ Ibid.

Grazing Time Loss

The García Muguerza family planted the currently reforested land at Santa Cecilia—40 hectares—over the course of 10 years. They maintained a relatively constant planting rate, which means that an average of 4 hectares were unavailable each year for grazing, forgoing \$419.56 per year in ranching income (\$104.89 per hectare; Table 7). Including planting costs, this brings the total implementation cost to \$336.89 per hectare, and the implementation cost for already-forested land would far less. By comparison, the cost of clearing and creating open pasture is approximately \$400 per hectare.

A common perception is that there is a large up-front cost associated with implementing silvopastoral systems. It is true that farmers must pay most of the costs up front as the system becomes largely self-sustaining after establishment. My research shows, however, that when done at a reasonable rate for the farm in question, the up-front cost is manageable. Silvopastoral systems are highly flexible, and farmers may forest land at as slow a rate as their financial resources require.

Chemical Use

The García-Muguerza family employs chemical pesticides and fertilizers in the planting of silvopasture, just as in all other cultivations at Hacienda Santa Cecilia. Organic farming is not well understood or practiced in the area. While this could easily change with environmental education in the future, it presents a very real environmental cost associated with the implementation of silvopastoral systems. Fertilizer overuse causes eutrophication of water bodies, which is an especially important in a region that experiences flooding. Eutrophication occurs when large amounts of nutrients run off into a water body and cause a large bloom of aquatic algae. This bloom generally blocks

sunlight for other plant life, and the decomposition of dead algal matter creates hypoxic conditions in which other species die for lack of oxygen.¹⁴⁸ Pesticide overuse can introduce toxins into the area that destroy natural fauna and poison rivers. Unfortunately, data is not available on the economic cost associated with these chemical products at the Hacienda. They are, however, only used when planting silvopasture, which becomes self-sustaining with time.

Cost-Benefit Analysis

In order to determine whether silvopastoral systems have a net economic benefit at Hacienda Santa Cecilia, I weigh the costs of implementation against the benefits. I consider all of the quantifiable benefits and costs to the farm arising from the institution of silvopastoral systems. I evaluated costs and benefits on a yearly basis, taking into account that Hacienda Santa Cecilia has an average of 4 hectares planted each year. I do not include environmental costs and benefits.

I calculated planting costs based on the previously calculated cost of planting algarrobo per hectare for 4 hectares, and time lost based on the net grazing income gained from each hectare, and multiplied for 4 hectares. I was unable to include the cost of chemical use due to the lack of data on the multitude of environmental costs of chemical use. However, it must be noted as a cost of silvopastoral systems as implemented at Hacienda Santa Cecilia.

I calculated productivity based on current milk production levels for a 4-hectare area, and on the tenfold increase in milk production in silvopastoral systems. However,

¹⁴⁸ R. A Vollenweider, "Scientific fundamentals of the eutrophication of lakes and flowing waters, with particular reference to nitrogen and phosphorus as factors in eutrophication," *OECD Report* (September 1970).

this measure does not include increases in meat productivity. I estimated cattle death prevention benefits was using the cattle flood death data obtained for Chone Canton from MAGAP. This does not include death and sickness due to drought, which MAGAP estimates to be 6 times higher. With the Toni corporation's estimated 3 cattle per hectare, a reforestation rate of 4 hectares/year could keep 12 cattle per year from death. As a proportion of Chone's total cattle death costs, these 12 cattle would represent an avoided cost of \$44.40. I calculated wood sales and feed based on current levels of wood sales and feed income per hectare (algarrobo seeds and yuca as feed, algarrobo as wood from the aforementioned thinning). I did not approximate the benefits of ecotourism and environmental services, because they have not yet been robustly implemented at Hacienda Santa Cecilia (or in Chone in general). Though the restaurant business shows promise, it has not been operating consistently, and reliable data is not available. Additionally, most customers are from the local area, and the ecotourism business that the family hopes to implement in the future targets tourists from elsewhere. Many landowners understand the concept of environmental services payments, and the Socio Bosque program is just starting up. Payments have not started; as such, no data is available. Nevertheless, ecotourism and environmental services have the potential to provide a great deal of income to farms that reforest (whether through silvopasture or not).

Considering all discussed costs and benefits, the benefits of silvopastoral systems outweigh the costs at Hacienda Santa Cecilia, especially considering all of the benefits not calculated. Total costs per year for implementation at a rate of 4 hectares per year totaled \$1,347.00, while total benefits were \$4,906.68, a cost-to-benefit ratio of roughly one to three (Table 9).

Table 9: Cost-Benefit Analysis of Silvopasture

Cost	Quantity /Year	Benefit	Quantity /Year
Planting ⁱ	\$928.00	Cattle Productivity ⁱ	\$4,195.60
Time lost ⁱ	\$419.56	Cattle Death Prevention	\$44.40
Chemical pollution	—	Wood Sales & Feed ⁱ	\$666.68
		Ecotourism	—
		Environmental Services	—
Total^{iv}	\$1,347.56	Totalⁱⁱⁱ	\$4,906.68

ⁱ Calculated for 4 hectares/year

ⁱⁱ Calculated based on MAGAP estimates of cattle deaths per hectare/year

ⁱⁱⁱ Does not include environmental benefits, ecotourism, and environmental services

^{iv} Does not include environmental costs of chemicals

The tenfold increase in cattle productivity accounts for the largest proportion of benefits. Future income from ecotourism and environmental services could increase the one-to-four cost-benefit ratio further, though not if the cost of chemical use is severe. It is unlikely that the cost is high, however, due to the fact that only 4 hectares are planted each year at a much larger spacing than normal crops, meaning toxins are not concentrated to the degree they are in ordinary cultivations. Therefore, the benefits of silvopastoral systems outweigh the costs at the Hacienda Santa Cecilia on the whole.

The Smallholder Solution

These advancements in environmental stewardship are only possible at the smallholder level. The primary difference between the García Muguerza family and many Ecuadorians is that they own land. Their ingenuity in creating their silvopastoral agroforestry solution to the problems they faced would not have been possible had they not owned property in the first place. As workers on an agribusiness farm, for example, they would have had no major incentive to come up with creative solutions to care for the land.

Previous Proposed Solutions to the Resource Curse

The solutions to the resource curse that development economists have proposed over the years have all primarily focused on state policy regarding revenue management, rather than on the underlying causes of the resource curse. Many proposed solutions for resource curse-afflicted countries presuppose strong state institutions, for example. However, as previously discussed, those countries that are afflicted by the resource curse today are typically rentier states characterized by a lack of political institutionalization. Such solutions generally target macroeconomic policy, economic diversification, and transparency, accountability, and public involvement. Natural resource funds and direct revenue distribution to citizens are mechanisms that are often proposed as methods of revenue management to achieve some of these goals—mechanisms that require strong institutionalization. Political scientists Erika Weinthal and Jauline Jones Luong explain, “In sum, they amount to either asking a weakly institutionalized state to employ capacities that it has not yet developed or relying on non-state actors (who often have little willingness or ability to do so) to monitor and constrain the state’s behavior.”¹⁴⁹

Such solutions were effective in resource-abundant Norway, which enjoys a diversified economy with a thriving private sector, strong political institutionalization and civic society, and rigorous environmental regulation, despite being the world’s fifth largest exporter of oil. However, Norway enjoyed strong political institutionalization long before the development of the natural resource export sector. Political institutions were already there to manage that development as it occurred. There is an emerging consensus in resource curse literature that strong institutions are vital to combating the

¹⁴⁹Erika Weinthal and Pauline Jones Luong, “Combating the Resource Curse: An Alternative Solution to Managing Mineral Wealth,” *Perspectives on Politics* 4, no. 1 (March 2006): 35-53.

resource curse. However, despite this fact, political economists rarely discuss how to build such institutions in countries afflicted with the resource curse.

One feature that distinguishes the resource-abundant countries that have maintained strong institutions and achieved favorable development outcomes (e.g., Australia, Canada, New Zealand, Singapore, the Netherlands, etc.) is that the export sectors of resource-abundant countries that have overcome the resource curse are not under sole government control. Private, domestic parties own large interests in the means of production of the export commodities. While Norway has a national oil company, Statoil, it is not wholly state-owned, as are those in countries generally afflicted with the resource curse. Thus, while the Norwegian state regulates the petroleum sector, it does not operate it. Foreign oil companies also do not control oil production in Norway. Rather, private, domestic parties have a stake in Norway's means of oil extraction, and the Norwegian government benefits indirectly via tax revenue from these private parties. There is also strong private investment in other sectors of the economy, preventing a mass movement of capital and labor into the commodity export sector. Previous solutions have generally taken for granted that it will be the state, rather than individuals, that will control the export sector and have simply looked at ways to make the state a better manager of export revenues. This misses the underlying causes of the resource curse.

Empirical evidence suggests that equitable land distribution is found in most consolidated democracies with strong market cultures in the same way that inequality is associated with underdeveloped countries. We have already examined the case of the United States; however, the trend is not limited to North America. In Japan, the first

stable democracy in Asia, the 1873 Land Tax Reform law redistributed land that had previously been held by a select few and is often credited with the eventual success of capitalism in the country.¹⁵⁰ The French Revolution redistributed land to a great degree. As nineteenth-century French philosopher Alexis de Tocqueville once stated: "Remove the secondary causes that have produced the great convulsions of the world and you will almost always find the principle of inequality at the bottom. Either the poor have attempted to plunder the rich, or the rich to enslave the poor. If, then, a state of society can ever be founded in which every man shall have something to keep and little to take from others, much will have been done for the peace of the world."¹⁵¹

Political Institutionalization

The ownership structure of the means of production of export commodities makes all the difference in combating the resource curse. Governments that are free to collect rents from the exportation of natural capital have no incentive to become transparent and accountable; no administration will willingly subject itself to increased public scrutiny when there is an easy way not to do so. Officials have no incentive to think in terms of long-term development and conservation goals when they perceive a wealth of rents for the taking and no force to prevent them from pocketing a good portion of the proceeds. Ownership stakes by private domestic parties in the means of production of an export commodity change this incentive structure.

Strong political institutions only come into being if the state has a strong reason to supply them and the governed have the investiture to demand them. Increasing private

¹⁵⁰ Niwa Kunio, "The Reform of the Land Tax and the Government Programme for the Encouragement of Industry," *The Developing Economies* 4, no. 4 (December 1, 1966): 447-471.

¹⁵¹ Alexis de Tocqueville, *Democracy in America*, 1840.

domestic ownership accomplishes both goals; not only does it create incentives for the state to engage in institution building, but it also creates private actors with the power and interest to demand institution building. A vested interest in the means of economic production gives private individuals something to vie for the political process and also empowers them to bring the government to the bargaining table.¹⁵² Don Freddy and Glenda, for example, have become local political leaders of a sort. Many look to them to bring grievances before the local government. It is plain to see that they are far more optimistic that their political actions will have meaningful results than their friends who do not own land.¹⁵³

With a high number of private landowners, it becomes impossible for the government to maintain corrupt relationships with all of them. These private parties have independent incomes, so the government also has an incentive to create institutions that regulate and tax those proceeds. Such a change in the incentive structure would be the first step toward the political institutionalization that has always evaded those countries like Ecuador that have been plagued by the resource curse.¹⁵⁴

Economic Stability and Investiture

Private ownership also helps halt boom-bust commodity cycles and soften the blow when they do occur. Smallholder farms are generally economically diverse, and so are less vulnerable to the crash of a single commodity. Additionally, owning land gives individuals a foothold from which they may launch other economic enterprises.

¹⁵² Weinthal and Luong, "Combating the Resource Curse."

¹⁵³ Muguerza, Interview.

¹⁵⁴ Elizabeth G. Katz, "Social Capital and Natural Capital: A Comparative Analysis of Land Tenure and Natural Resource Management in Guatemala," *Land Economics* 76, no. 1 (February 1, 2000): 114-132.

Ecotourism is a good example; it would be far more difficult for Glenda and Don Freddy to think about starting an ecotourism business if they did not have the foothold provided by the Hacienda. Individuals who have the ability to be economically productive are generally more invested in market systems and less likely to be the objects of exploitation. They are more likely to form joint ventures with their peers, and a thriving private sector is the result. As Klaus Deininger states, “Land is a key asset for the rural and urban poor that provides an important foundation for economic and social development. Sound property rights in, and equitable access to, land can also offer the potential to help empower the rural and urban poor to adjust to the challenges posed by recent trends of globalization.”¹⁵⁵

Environmental Stewardship

When a smallholder owns a parcel of land, she or he has a long-term interest in its wellbeing. The incentive to pillage the land for short-term profit disappears. Once an interest in the long-term ability of land to sustain one’s livelihood is established, one is far more likely to develop a relationship with the land, especially over generations; one becomes a part of the living community she or he lives in. Though this land owner will still pursue her or his economic interests, she or he is highly likely to develop methods by which to do so sustainably to ensure the long-term viability of her or his livelihood. In effect, private ownership avoids the Tragedy of the Commons. As Daniel Wachter states, “Without clear and enforced property rights, everyone is afraid that neighbors will reap the fruits of one’s own restraint in resource use, so user costs (the present value of

¹⁵⁵ Klaus Deininger, *Land Policies for Growth and Poverty Reduction* (New York: Oxford University Press, 2003).

possible future profits foregone by using a resource unit today) are ignored. By contrast, a resource user who has a secure, long-term property right over the resource will take into account any possible future utility from the resource. When user costs figure in the decision making of a rational economic agent, a race to exploit the resource is avoided and conservation objectives are served.”¹⁵⁶

Conclusion

The story of the Hacienda Santa Cecilia demonstrates the ability of the smallholder to challenge the resource curse from the bottom up. Owning land gives citizens a stable foothold in both the political and economic arena. Not only does private land ownership by many rather than a few encourage greater social equity and political stability, but also many ecologically-sound farming practices—organics, intercropping, silvopasture, etc.—are only possible on a small scale. Smallholders have the incentive to care for the land they own, as it is in their interest to think in the long-term.

Rather than exerting so much energy looking outward for macroeconomic policy solutions to underdevelopment, the Ecuadorian government should look at the success of stories like that of the Hacienda Santa Cecilia. Though many farmers have benefited from land reform in the past, the distribution of land in Ecuador is still highly inequitable. There are many ways in which land reform may be conducted, and such mechanisms are not the subject of this thesis. However, smallholders represent possibly the only actors in the system that are not subjected to the toxic incentives that resource abundance creates, and thus deserve the highest consideration in any discussion of development.

¹⁵⁶ Daniel Wachter, *Land Titling for Land Conservation in Developing Countries?* (World Bank, Environment Dept., Policy and Research Division, 1992).

Conclusion

Ecuador possesses vast wealth. This wealth is not the oil that lies under its lands, and it is not the bananas it exports. Ecuador's real wealth lies in its diverse peoples and ecosystems. However, a "rentier" commodity mentality has pervaded the country since the colonial era, which has placed universal value on export commodities. Centuries of devastating boom-bust cycles have not shifted leaders away from this mentality. Rather, resource abundance continues to create a toxic incentive structure that affects both domestic and international actors. The global economic system cements this incentive structure through the law of comparative advantage by which states like Ecuador must commoditize and export their natural wealth because that is the only way they can compete in the market.

The Ecuadorian government has attempted to address underdevelopment by implementing a series of different macroeconomic strategies fluctuating between state intervention in the economy and free market capitalism. However, all of these strategies have only increased inequality and environmental destruction. This is due to the fact that such policies were originally created by policymakers on the other side of the world who had no hope of understanding the complexities of Ecuadorian culture and ecology. By assuming that their policies were universally applicable, they also ignored the very real incentives that resource abundance creates, and to which they themselves were subject. At the most basic level, macroeconomic policy is simply incapable of addressing the root incentive structure behind the resource curse.

However, the resource curse is not inevitable. There is one actor in the system that does not experience the strong pull of resource commoditization: the smallholder. While the resource curse continues to puzzle Ecuador's leaders and economists the world

over, Don Freddy García and Glenda Muguerza have managed to create for themselves an enclave in which the problems of the resource curse seem not to exist. As a result of owning land and spending their entire lives forming a bond with that land, they are invested in its long-term health and viability. From there, they have been able to use their own ingenuity to create a livelihood for themselves that is environmentally sustainable and economically productive. Unlike many of their peers, they are politically and economically empowered, and they are true stewards of their land. Don Freddy and Glenda share the responsibilities of running the Hacienda Santa Cecilia in a remarkably socially equitable manner given the macho culture of the area. Upon meeting them, you get the immediate impression that you are looking at the future—or what it could be.

The question that remains is how Ecuador can go about encouraging this future. While the answer may be complex, it is clear that private ownership of their land was key to their success. Land is a limited resource, but land reform is always possible. Combined with environmental education programs that teach new landowners how to effectively manage their land the way Don Freddy and Glenda learned to do on their own, a reform program could be an integral part of Ecuador's path out of underdevelopment. Larger numbers of politically empowered individuals could form the type of stable political parties that have always been absent in Ecuador and that lead to the accountability and institutionalization necessary for so many other proposed solutions to the resource curse. A larger number of economically invested individuals would create an incentive for the state to engage in institution building as well in order to reap the tax revenue such a population could offer. Above all, increased private land ownership

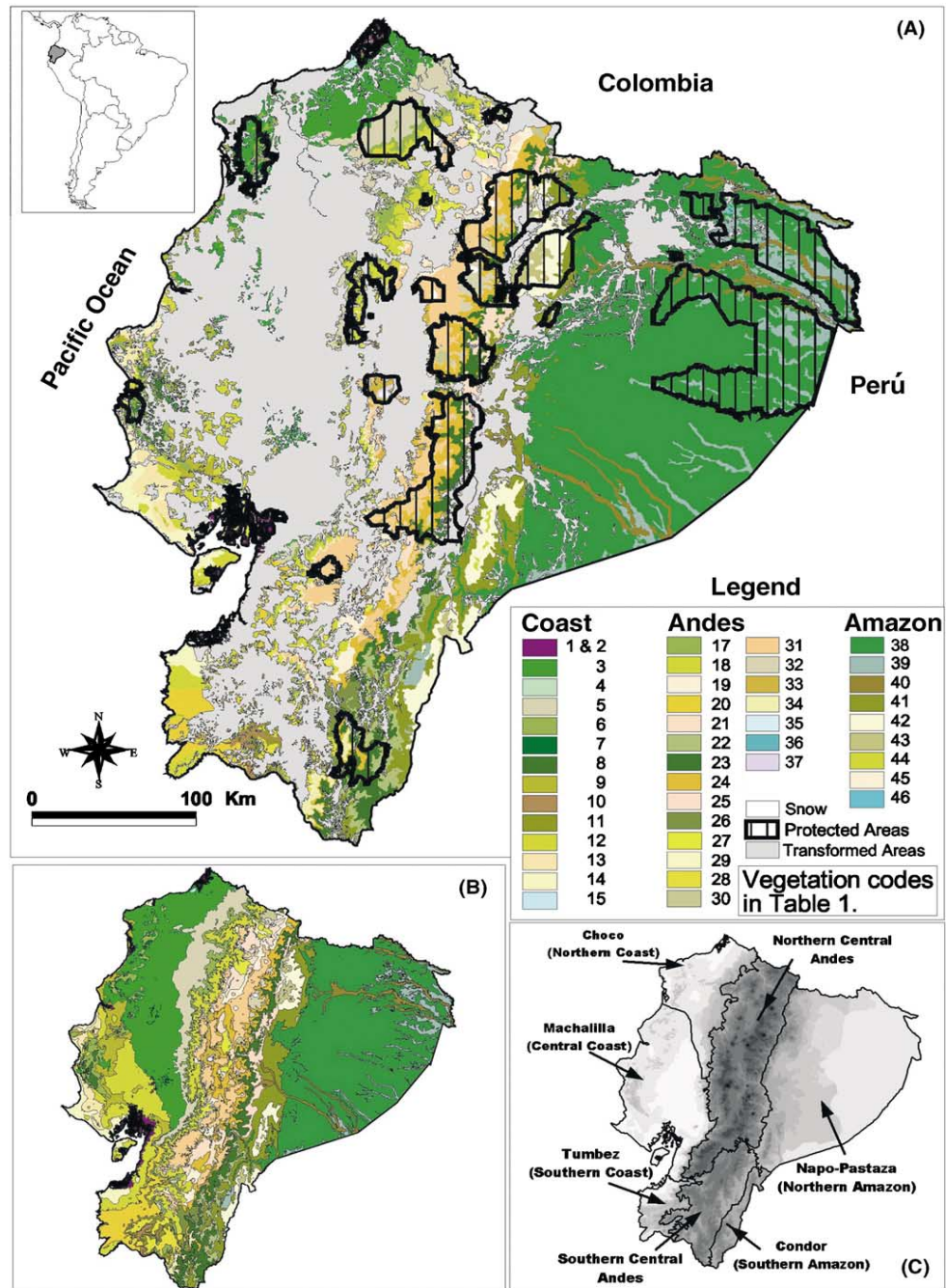
would create a legion of environmental stewards committed to the long-term future of the living communities to which they belonged.

Land reform is a long and difficult process. However, equitable distribution of land is a basic, fundamental step necessary to escape the resource curse. Macroeconomic policy will not get Ecuador there. The people will.

Appendices

Appendix A: Conservation Priorities in Ecuador

Map of Ecuador: (A) ecosystem and natural reserve coverage in the late-1990s; (B) theoretical original ecosystem distribution; (C) ecoregions and elevation in continental Ecuador



Source: Reproduced from Sierra, Campos, and Chamberlin (2002)

Accompanying Table of Ecosystem Codes

Region	Formation	Code	Ecosystem (vegetation type)
Coast	Closed forest	1	Mangrove
		2	Dwarf mangrove ^a
		3	Coastal lowland evergreen forests
		4	Coastal lowland inundated forests (guandal)
		5	Coastal foothill evergreen forests
		6	Coastal cordillera foothill evergreen forests
		7	Coastal cordillera lower montane evergreen forests
		8	Coastal cordillera montane cloud forests
		9	Coastal lowland semideciduous forests
		10	Coastal foothill deciduous forests ^b
		11	Coastal lower mountain semideciduous forests
		12	Coastal lowland deciduous forests
	Open forests	13	Savanna
	Scrublands	14	Coastal lowland dry shrub ^c
	Aquatic graminoid vegetation	15	Lake and river graminoid vegetation ^d
	Other	16	Pacific sandy beaches and cliffs
Andes	Closed forests	17	Western Andes lower montane evergreen forests
		18	Western Andes montane cloud forests
		19	Western Andes upper montane evergreen forests
		20	Western Andes lower montane semideciduous forests
		21	Northeastern Andes lower montane evergreen forests
		22	Southeastern Andes lower montane evergreen forests
		23	Eastern Andes montane cloud forests
		24	Eastern Andes upper montane evergreen forests
	Scrublands	25	Northern Andes montane humid shrub
		26	Southern Andes montane humid shrub
		27	Northern Andes montane dry shrub ^e
		28	Southern Andes montane dry shrub
		29	Northern Andes lower montane dry shrub ^f
	Graminoid vegetation	30	Espeletia páramo
		31	Herbaceous páramo
		32	Cushion páramo
		33	Dry páramo
		34	Southern Andes shrub páramo
	Aquatic graminoid vegetation	35	Montane-lake graminoid vegetation
		36	Upper montane lake graminoid vegetation
	Nival vegetation	37	Super páramo
Amazon	Closed forests	38	Amazon lowland evergreen forests
		39	Amazon lowland black-water inundated evergreen and palm forest
		40	Amazon lowland white-water inundated evergreen forests
		41	Amazon foothill evergreen forests
		42	Amazon cordillera lower montane evergreen forests
		43	Amazon cordillera montane evergreen forests
	Scrublands	44	Amazon cordillera montane humid shrub ^g
		45	Amazon cordillera upper montane humid shrub ^g
	Aquatic graminoid vegetation	46	Amazon lowland lake graminoid vegetation

^a The dwarf mangrove is included in the mangroves by Cerón et al. (1999).

^b Lowland dry shrub includes the littoral thorn vegetation and the littoral dry shrub of Cerón et al. (1999).

^c The coastal foothill deciduous forests are included in the coastal foothill semideciduous forests by Cerón et al. (1999).

^d Lake and river graminoid vegetation are considered distinct vegetation types by Cerón et al. (1999).

^e Northern Andes montane dry shrub includes the montane thorn vegetation of Valencia et al. (1999).

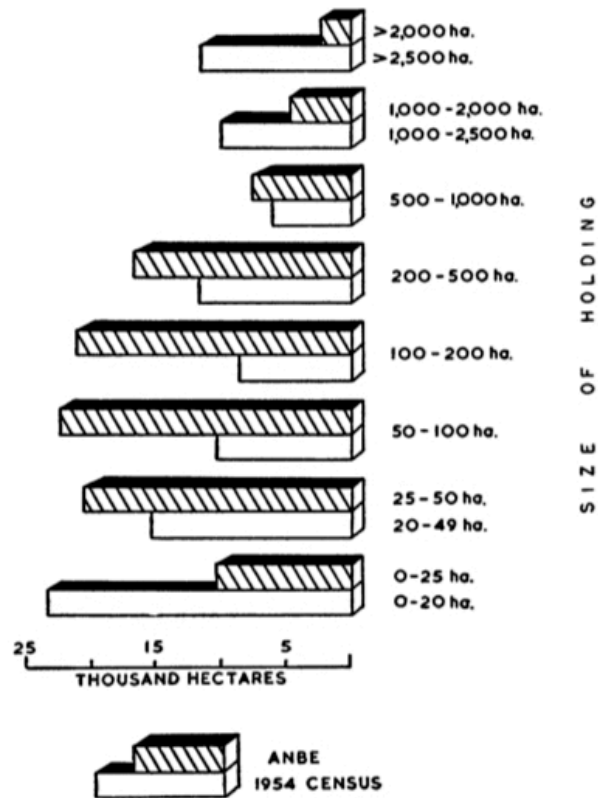
^f Northern Andes lower montane dry shrub is included in the northern Andes montane dry shrub by Valencia et al. (1999).

^g The Amazon cordillera montane humid shrub and upper montane humid shrub correspond to the Amazon cordillera lower montane humid shrub and montane humid shrub, respectively in Palacios et al. (1999).

Source: Reproduced from Sierra, Campos, and Chamberlin (2002)

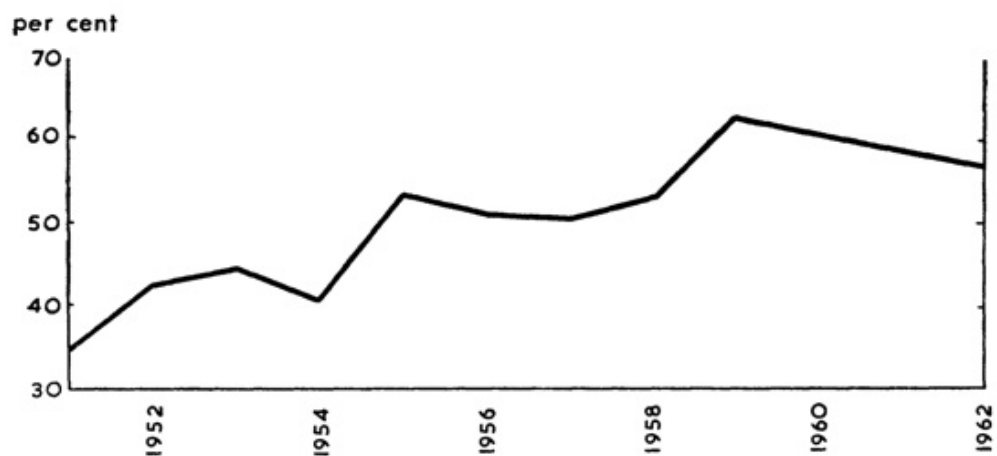
Appendix B: Banana Boom Graphics

Distribution of Banana Production by Size of Land Holding



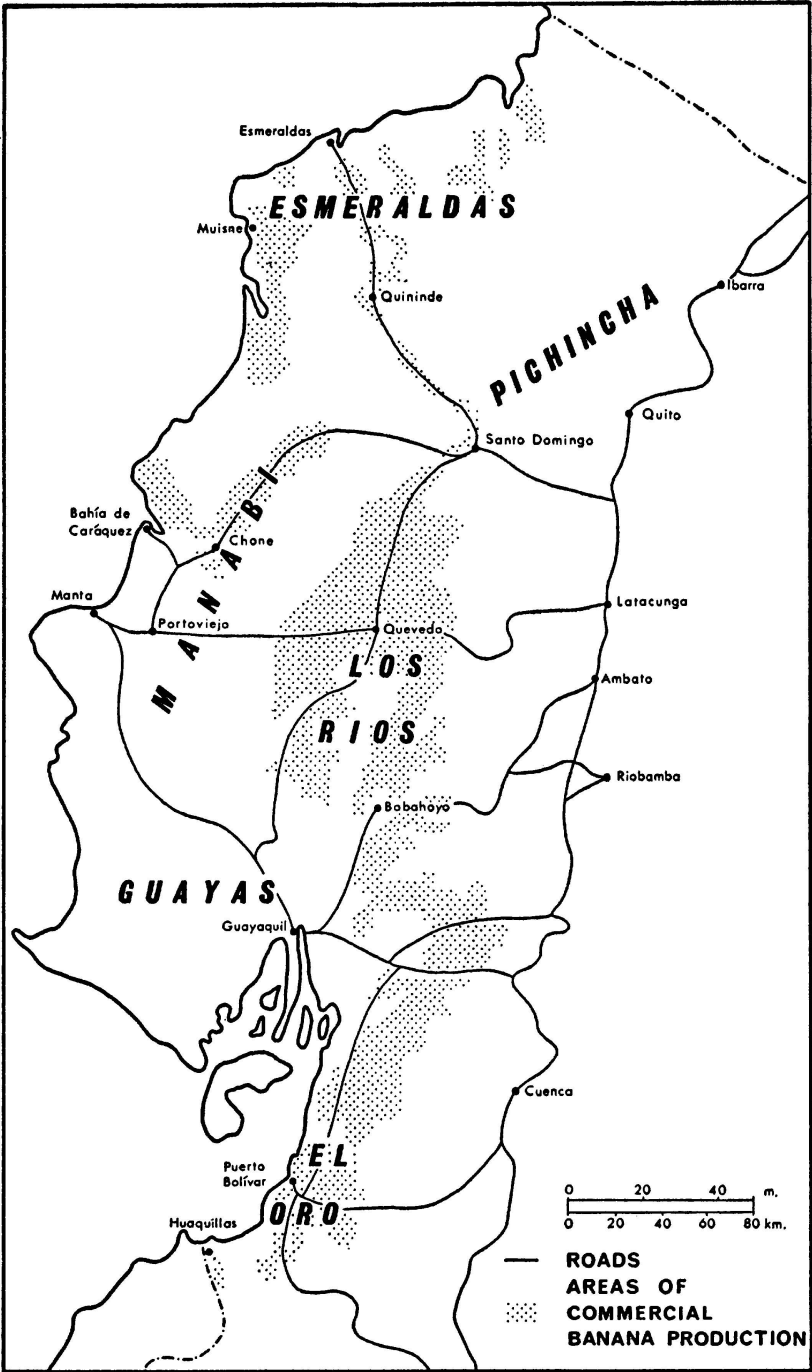
Note: ANBE (Asociación Nacional de Bananeros de Ecuador) represents banana exporters.
Source: Reproduced from Preston (1965)

Banana Exports as a Percentage of Total Exports by Value



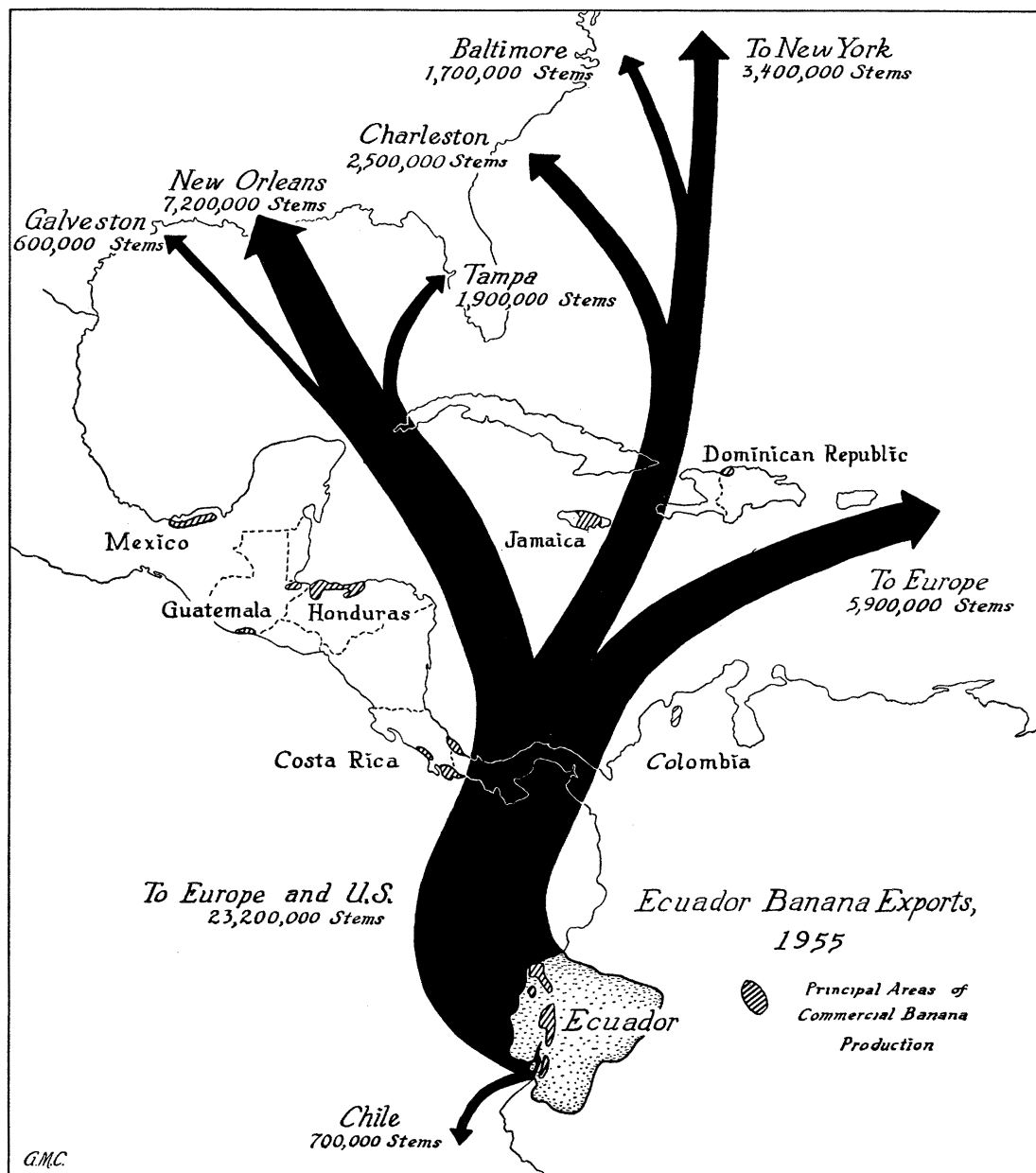
Source: Reproduced from Preston (1965)

Location of Banana Production in the Costa Region of Ecuador



Source: Reproduced from Preston (1965)

Destination of Ecuadorian Banana Exports



Source: Reproduced from Parsons (1957)

Appendix C: Agency Visits and Interviews

Agency Visits

Fundación Natura
Elia Liut N45-10 y Telégrafo Primero
Quito, Ecuador
March 10, 2010

Banco Central del Ecuador
Avenida 10 de Agosto N11-409 y Briceño
Quito, Ecuador
April 8, 2010

Ministerio de Agricultura, Ganadería, Acuacultura y Pesca (MAGAP)
Avenida Eloy Alfaro y Amazonas
Quito, Ecuador
April 10, 2010

Cooperativa de Producción Agropecuaria Chone Ltda.
Chone, Ecuador
Dates of Visits: April 12-24, 2010

Oficina del Turismo (*Office of Tourism*)
Gobierno de Chone
Chone, Ecuador
April 20, 2010

Oficina del Desarrollo Sostenible (*Office of Sustainable Development*)
Gobierno de Chone
Chone, Ecuador
April 20, 2010

Local Dairy Collection Facility
Industriales Lácteas Toni S.A.
Chone, Ecuador
April 21, 2010

Local Branch Office
Ministerio de Agricultura, Ganadería, Acuacultura y Pesca (MAGAP)
Chone, Ecuador
April 23, 2010

Individual Interviews in Chone, Ecuador

Glenda Muguerza
Local Farmer
Member of Cooperativa de Producción Agropecuaria Chone Ltda.
Dates of Interviews: April 12-24, 2010

Don Freddy García
Local Farmer
Member of Cooperativa de Producción Agropecuaria Chone Ltda.
Dates of Interviews: April 12- 24, 2010

Sthefani Sofia García Muguerza
Daughter of Don Freddy and Glenda, Age 13
Dates of Interviews: April 12-24, 2010

Freddy Barón García Muguerza
Son of Don Freddy and Glenda, Age 17
Dates of Interviews: April 12-24, 2010

Carlos Álvarez Mosquera
Local Farmer
Member of Cooperativa de Producción Agropecuaria Chone Ltda.
Date of Interview: April 13, 2010

Eva Bowen
Local Farmer
Member of Cooperativa de Producción Agropecuaria Chone Ltda.
Date of Interview: April 14, 2010

Jorge Andrade
Local Resident
Agricultural Economics Student
Dates of Interviews: April 14-24, 2010

Alonso García
Local Farmer
Cousin of Don Freddy García
Member of Cooperativa de Producción Agropecuaria Chone Ltda.
Date of Interview: April 21, 2010

Judy Monseratte
Local Resident
Agricultural Economics Student
Date of Interview: April 23, 2010

Interview Questions Asked of Farmers

¿Cómo se llama? ¿En qué trabaja usted? ¿Cuántos años tiene? *(What is your name? What is your occupation? How old are you?)*

¿Cómo es usado el suelo en su finca? ¿Cuántos hectáreas son usados para potrero, el sistema silvopastoril, bosque nativo, y los cultivos? ¿Cuántos animales tiene? *(How is land used on your farm? How many hectares are used for pasture, silvopasture, native forest, and crops? How many animals do you have?)*

¿Cuántos kilogramos de cada cultivo puede producir por hectárea por año? ¿Cuánto carne puede producir por año y cuánto leche por individuo por año? *(How many kilograms of each crop can you produce per hectare per year? How much meat can you produce per year and how much milk per individual per year?)*

¿Cuál es el precio del mercado de cada cultivo, de leche, y de carne? *(What is the market price of each crop, of milk, and of meat?)*

¿Cuáles son los gastos asociados con cada producto? *(What are the costs associated with each good?)*

¿Han sido afectados negativamente por problemas ambientales sus cultivos o ganados antes? ¿Cómo? *(Have your crops or livestock ever been negatively affected by environmental problems? How?)*

Usted mencionó que tiene ___ hectáreas en el sistema silvopastoril. ¿Cuáles tipos de árboles usa? ¿Por qué? *(You mentioned that you have ___ hectares of silvopasture. Which types of trees do you use? Why?)*

¿Cuántos hectáreas de cada árbol ha sembrado? ¿Cuántos árboles en cada hectárea? *(How many hectares of each type of tree have you planted? How many trees in each hectare?)*

¿Cuál es el método que usó para sembrar, y cuánto costó? *(What method did you use for planting, and how much did it cost?)*

¿Usted corta algunos árboles cada año para vender? ¿Cuántos por hectárea y de cuáles tipos? ¿Cuál es el precio del mercado de cada tipo de árbol? *(Do you cut some trees every year to sell? How many per hectare and which types? What is the market price for each tree?)*

¿Usted ha realizado o pensado en realizar algún proyecto del ecoturismo en su bosque nuevo? *(Have you done or thought about doing an ecotourism project in your new forest?)*

¿Usted ha recibido pagos por los servicios ambientales de sus árboles? *(Have you received payments for the environmental services of your trees?)*

Interview Questions Asked of Non-Farmer Residents

¿Cómo se llama? ¿En qué trabaja usted? ¿Cuántos años tiene? *(What is your name? What is your occupation? How old are you?)*

¿Usted cree que cantón Chone ha sido muy deforestado? ¿Por qué? *(Do you believe that Chone Canton has been very deforested? Why?)*

¿Cuándo empezó la deforestación, y qué la causó? *(When did the deforestation start, and what caused it?)*

¿Qué piensa usted de la deforestación? ¿Cómo ha afectado su vida? *(What do you think about deforestation? How has it affected your life?)*

¿Con respecto a la deforestación, cree que Chone es diferente de otros cantones? *(With respect to deforestation, do you believe Chone is different from other cantons?)*

¿Conoce al sistema silvopastoril? ¿Qué piensa del sistema y de la reforestación? *(Do you know about the silvopastoral system? What do you think about the system and about reforestation?)*

¿Qué piensa usted de las políticas del gobierno a cerca de la agricultura? *(What do you think about government policies with regard to agriculture?)*

Appendix D: Complete Budget of the Hacienda Santa Cecilia

Crops

INCOME					EXPENSES		PROFITS		
Item	Ha	Kg/Ha/ Yr	Price/kg	Income/ ha	Description	Expenses/ ha	Inc-Exp/ ha	Total Profit	
Corn	60	3150	\$0.27	\$840	Seeds	\$50			
					Planting	\$42			
					Labor	\$84			
					Fertilizer	\$220			
					Chemicals	\$60			
					Fumigation	\$56			
					Harvesting	\$42			
					Processing/ Transport	\$105			
					Total	\$659			
Passion Fruit	15	15000	\$0.32	\$4,800	Labor	\$2,428			
					Fertilizer	\$50			
					Chemicals	\$30			
					Seeds	\$40			
					Fences	\$32			
					Posts	\$360			
					Total	\$2,940			
Cacao	3	900	\$2.22	\$2,000	Seeds	\$375			
					Planting	\$10			
					Labor	\$210			
					Irrigation	\$350			
					Chemicals	\$100			
					Total	\$1,045			
Papaya	4			\$1,200	Seeds	\$375			
					Planting	\$10			
					Labor	\$210			
					Chemicals	\$100			
					Harvesting	\$336			
					Total	\$1,031			
Yuca	6	11250	\$0.11	\$1,250	Planting	\$140			
					Labor	\$140			
					Chemicals/ Fumigation	\$35			
					Harvesting	\$70			
					Total	\$385			
Plantain	3	1000 bunches	\$1.50/ bunch	\$1,500	<i>Taken care of by cacao</i>	\$0			
					Plants	\$120			
					Planting	\$70			
					Harvesting	\$672			
					Total	\$862			
Algarrobo	300	1500 (feed) 1.67 (wood)	\$0.11	\$166.67	Seeds	\$3.33	one time		
					Planting	\$140			one time
				\$10	\$16.67	Harvesting	\$0		
						Total	\$0		
							Total	\$104,405	

Note: Ha = Hectares, Kg = Kilogram, Qty = Quantity, Yr = Year, Inc = Income, Exp = Expense

Grazing

INCOME					EXPENSES		PROFITS
Cattle	Qty/day	Qty/yr	Price	Income	Description	Expense	Inc-Exp
Milk	250	91,250	\$0.40	\$36,500	Workers	\$7,200	
Calves		30	\$200	\$6,000	Vitamins	\$450	
Heifers		5	\$500	\$2,500	Minerals	\$1,200	
Discard		10	\$300	\$3,000	Parasite medication	\$60	
					Vaccines	\$600	
					Antibiotics	\$720	
					Vet	\$2,400	
					Administration	\$6,000	
					Transport	\$3,600	
					Feed costs	\$4,896	
			Total	\$48,000		\$27,126	\$20,874

Note: Ha = Hectares, Kg = Kilogram, Qty = Quantity, Yr = Year, Inc = Income, Exp = Expense

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