Spring 5-15-2020

The Relationship Among Financial Institutions, Safeguards and Hydroelectric Dams in the Amazon

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This Master's Project

The Relationship Among Financial Institutions, Safeguards and Hydroelectric Dams in the Amazon

by

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is submitted in partial fulfillment of the requirements
for the degree of:

Master of Science
in
Environmental Management

at the

University of San Francisco

Submitted: Received:

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Amy Juelsgaard Date Stephanie A. Siehr, Ph.D. Date

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List of Acronyms

AFD: Agence Francaise de Developpement
ANEEL: National Agency for Electrical Energy in Brazil
BNDES: Brazilian Development Bank
BRICS: Brazil, Russia, India, China, South Africa
CaDB: Caribbean Development Bank
CAF: Development Bank of Latin America
CDB: China Development Bank
CELEC: Corporacion Electrica del Ecuador
CHEXIM: China Export Import Bank
CONELEC: National Electricity Council in Ecuador
CNEC: National Consortium of Consulting Engineers in Brazil
CNPE: National Council on Energy Policy in Brazil
EIA: Environmental Impact Assessment
EIB: European Investment Bank
ENARSA: Energia Argentina
IBAMA: Brazilian Institute for the Environment and Renewable Natural Resources
IBRD: International Bank of Reconstruction and Development
IDB: Inter-American Development Bank
IESS: Social Security Institute of Ecuador
IFC: International Finance Corporation
IIC: Inter-American Investment Corporation
INECEL: Ecuadorian Institute of Electricity
KfW: KfW Development Bank
MEER: Ministry of Electricity and Renewable Energy in Ecuador
US EXIM: Export Import Bank of the United States

Abstract

Since 2015, the Amazon experienced an infrastructure boom with more than $70 billion in infrastructure projects planned in the coming years. Large-scale projects have resulted in detrimental environmental and social impacts in the region over the last fifty years. This paper uses policy analysis and case studies to examine the evolution of financial institutions and their safeguards over time and how this evolution has affected the environmental and social impacts of hydroelectric dams in the Amazon. The case studies of two hydroelectric projects, the Coca Codo Sinclair Dam in Ecuador and the Belo Monte Dam in Brazil, highlight that the dams caused extensive environmental and social damage, including deforestation, loss of biodiversity, displacement and loss of livelihoods, among others. The safeguard approach of the financial institutions in these cases had little effect at mitigating the impact of the dams, demonstrating that the evolution of safeguards over time has not resulted in less environmentally and socially harmful hydroelectric projects in the Amazon. Financial institutions with minimal safeguards, mainly the national development banks from Brazil and China, have emerged as dominant actors in the region with little concern for the consequences of their financing. In order to protect this vulnerable ecosystem, governments of Amazonian countries should not develop any more large-scale hydroelectric dams and the Brazilian and Chinese national development banks should implement their own safeguards in order to approve new projects for funding.

1. Introduction and Research Questions

This research examines the relationship between economic development and environmental conservation. Government officials often voice the need to develop their economies even if that means negatively affecting the environment and local communities in the process, such as the Interoceanic Highway in Peru and the Santo Antonio Dam in Brazil, both of which caused extensive deforestation, loss of biodiversity, displacement of people and a spike in illegal activities. This research challenges the development argument put forward by many politicians by looking at the base of economic activity – infrastructure – specifically, hydroelectric dams in the Amazon.

Infrastructure is meant to boost national and local economies and provide public services. However, many infrastructure projects have caused severe environmental and social damage and failed to provide the economic and public services for which they were built. One way to mitigate the environmental and social impacts of infrastructure projects is through safeguards, which are policies, standards and procedures used to determine and minimize environmental and social risks of projects. Financial institutions, such as the World Bank, apply safeguards as conditions to the project finance lent to borrower governments. Although the safeguards of multilateral development banks have become more stringent over the years, infrastructure projects in the Amazon have continued to move forward with grave consequences for the surrounding environment and communities.

My main research question is: How has the evolution of safeguards of financial institutions affected the environmental and social impacts of hydroelectric dams in the Amazon? Ultimately, this research analyzes if the stringent safeguards within multilateral development banks has mitigated the environmental and social impacts of hydroelectric dams in the Amazon, or created an opportunity for new investors, such as national development banks, with minimal safeguards, to finance the riskiest projects – resulting in negative environmental and social effects. My sub-questions are: 1) Are certain safeguard approaches of financial institutions more effective than others at mitigating environmental and social impact? 2) Is the substance of the safeguard itself the critical aspect to mitigate impact or is it the implementing partner of the safeguard? and 3)

How prominent have national development banks become vis a vis multilateral development banks in the Amazon and what has been the result of their emergence on the financing scene?

I hypothesize that because multilateral development banks have strengthened their safeguards so much, borrower countries are turning to investors with the weakest safeguards, mainly the national development banks from China and Brazil, to acquire funding for hydroelectric dams. These new alliances are resulting in large-scale and long-lasting negative impacts in the Amazon both environmentally and socially.

Considering the push for more infrastructure projects in the region, it is critical to understand how to mitigate their environmental and social impacts in order to keep this unique ecosystem intact. It is also important to understand if dams are truly serving their purpose of providing economic and public services, or if alternatives, such as energy efficiency or solar power, are preferable. Currently, safeguards are one of only a few tools to protect the environment and local communities from damage caused by infrastructure, which includes increased deforestation, water contamination, the loss of aquatic biodiversity, etc. As such it is vital to examine how they have changed over time and who all of the actors are to provide recommendations for reduced impact from hydroelectric dams in the Amazon.

This report begins with detailed background on the significance of the Amazon region by highlighting its rare characteristics, such as its high levels of biodiversity. It then touches on the rise of infrastructure in the region, particularly hydroelectric dams, and the impacts of such projects on the surrounding environment and local communities. This section also introduces the concept of environmental and social safeguards. Following the background, the report outlines the methodology used to complete the research: policy analysis and case studies. In the policy analysis, the research follows the evolution of safeguards through the first financing entity to design and implement them, the World Bank. This section presents the two main approaches to safeguards – traditional and country systems – and ends with a comparison of the safeguards of the nine financial institutions providing loans in Latin America. The report includes two case studies – the Coca Codo Sinclair Dam in Ecuador and the Belo Monte Dam in Brazil – and provides information on the project overview and location, project history, environmental and social impacts caused by the project and the financial institution's compliance with

environmental and social items. To finalize the report, there is a section on discussion and conclusions with an analysis of the findings followed by recommendations stemming from these findings.

2. Background

Chapter two provides a literature review with information on the significance of the Amazon rainforest by describing each of the elements that makes this ecosystem unique. It also gives detailed information on infrastructure in the Amazon and outlines the specific environmental and social impacts caused by hydroelectric dams. The section describes the funding landscape of these large-scale projects and notes the shifting in finance from multilateral institutions to national development banks. The chapter ends with a background on environmental and social safeguards, starting by defining safeguards and then noting their advantages.

2.1 Significance of the Amazon

The Amazon formed over 30 million years ago and today is the world's largest tropical forest (Burnham et al. 2004). Spread across eight countries - Brazil, Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela and one territory, French Guyana, - the legal boundaries of the Amazon are approximately two times the size of India at more than 6.5 million kilometers squared (Da Silva et al. 2005). Figure 1 depicts the location of the Amazon in South America outlining its boundaries to give a sense of the size of the region, some 40% of the continent. The Amazon houses the greatest amount of biodiversity in the world, home to 10% of all known plants and animals. For over 11,000 years indigenous groups have inhabited the Amazon (Roosevelt et al. 1996). Today the basin is home to over 35 million people, including 400 indigenous groups. It is one of the last places on the planet where isolated tribes live, with an estimated 100 uncontacted groups (Amazon Conservation Association 2020). The Amazon stores twenty percent of the world's freshwater and has a fundamental role in the global and regional climate cycles. This unique regions stores 150-200 billion tons of carbon making it a vital tool for solving climate change (Nobre et. al 2016).

Figure 1. Map of South America showing the location and outline of the Amazon biome in yellow and basin in blue.

Source: World Wildlife Fund

Renowned for its forests and rivers, one-tenth of the planet's flora and fauna is found in the Amazon, higher than any other ecosystem. Figure 2 shows global maps depicting species richness for all birds, mammals and amphibians with the largest amounts in red. The figure highlights the extensive biodiversity found in the Amazon with at least 40,000 plant species, 427 mammals, 1,294 birds, 378 reptiles and 427 amphibians in total (Da Silva et al. 2005). Each year over 100 new species are discovered (Amazon Conservation Association 2020). Currently, roughly 2.1 million square miles of the Amazon is forested, and these forests contain close to half of all trees in tropical forest areas worldwide (Crowther et al. 2015), with an estimated 16,000 different species of trees (Steege et. al 2013). Between 3,500-5,000 species of fish are found throughout the Amazon's plethora of rivers (Andersen et al. 2018).

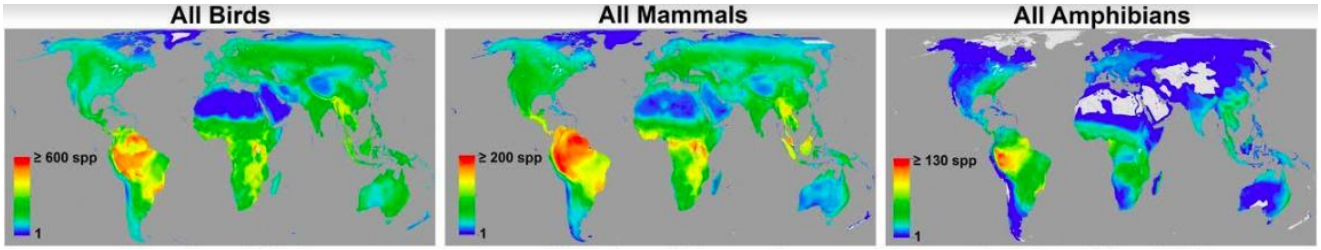

Figure 2. Global maps showing species richness (biodiversity) levels for different categories of species: birds, mammals, and amphibians.

Source: Jenkins et al. 2013

The Amazon plays a fundamental role in global water cycles. The Amazon watershed and river system is 2.3 million square miles and one-fifth of global freshwater is stored within this system (Latrubesse et al. 2017). The Amazon River is the largest tributary to the planet's oceans and has over 1,100 tributaries running over 4,000 miles (Pedersen 2016). Figure 3 presents a map of the major rivers in the Amazon. Four of the world's ten largest rivers are in the Amazon, including the Amazon, Negro, Madeira and Japura rivers. This vast network of rivers transfers sediments and solutes across vast distances, resulting in the world's largest floodplain and over 1,000,000 kilometers squared of wetlands (Latrubesse et al. 2017). Over 90% of sediments in the Amazon River come from a source in the Andes demonstrating the connectivity of the river network system (Anderson et al. 2018).

The Amazon rainforest helps regulate climate cycles, such as the El Niño-Southern Oscillation, and rainfall patterns in the region (Lawrence & Vandecar 2015). Twenty-two billion tons of water is released from soils to the atmosphere on a daily basis through the process of evapotranspiration. Close to 50% of the region's rainfall is produced by evapotranspiration from the forest (Salati et al. 1979). The Amazon forces large-scale circulation patterns in the atmosphere and produces aerial rivers. This allows the Andes Cordillera to drive cloud formation and rain, resulting in maximum rainfall over the western Amazon (Figueroa & Nobre 1990). These atmospheric patterns and aerial rivers create rainfall in the Andes for tropical glaciers, paramos, punas and yungas and supply water for major cities, including Bogota, Quito, Lima and La Paz. Over two-thirds of South America's gross domestic product is produced in areas that receive rain produced by the Amazon (Nobre 2014).

Figure 3. Map depicting the major rivers and tributaries in the Amazon.

Source: Myster 2017

The Amazon represents a fundamental tool to combat climate change by absorbing 2 billion tons of the carbon each year, which represents 5% of global emissions (Amazon Conservation Association 2020). Overall, the area stores over 150 billion metric tons of carbon – approximately a decade's worth of human-caused global emissions (Brienen et al. 2015). However, experts predict that due to current threats the Amazon will convert from one of the world's most critical carbon sinks to a carbon source.

The Amazon's waters and forests are of vital importance to the economy of South America. Despite this crucial ecosystem, over 75 million hectares of forest - about 17% of the Amazon – has been lost since 1978 due to a variety of activities, including agriculture, mining and infrastructure. The rate of deforestation has increased, reaching a new peak in 2017. This deforestation threatens the integrity of the system and experts warn that the Amazon could be nearing a tipping point, which they estimate at 20-25% total deforestation, in which the rainforest would turn to a fire-prone, dry savanna (Lovejoy & Nobre 2018).

2.2 Infrastructure in the Amazon

Infrastructure in the Amazon has had direct negative effects on the project sites and surrounding areas, such as increasing deforestation and threatening aquatic biodiversity, as well as indirect effects, including greater land speculation and illegal mining. There is a clear link between infrastructure projects, mainly hydroelectric dams and roads, and deforestation. Yet despite the evidenced damage of the sector, the Amazon is currently experiencing an infrastructure boom with more than $70 billion in infrastructure projects planned in the coming years (Ray et al. 2018). This surge in infrastructure has been associated with large environmental impacts. From 2000-2015 there were 27 infrastructure projects in the Amazon out of a total of 60 projects financed by development banks. Since 2015, 58 new projects have been completed or had financing approved, and 46 of them are in the Amazon. Most of these projects are in the Andean nations - Ecuador, Peru and Bolivia - due to the presence of the Amazonian headwaters in these countries. Investments from the countries' GDPs in infrastructure have more than doubled in Peru, Bolivia and Colombia from 2008-2015 (Ray 2018). Much of the development bank lending in Ecuador, Peru and Bolivia has been for highway construction and improvement, as well as hydroelectric dams (Ray et al. 2018).

Governments argue that dams are needed for economic development and to lower carbon emissions (Latrubesse et al. 2017). Hydroelectric energy is touted as clean and necessary to meet sustainable development goals, including combating climate change. It is the largest source of renewable energy across the globe, comprising 71% of renewables as of 2016 (Moran et al. 2018). However, the global hydropower field has changed over time with more dams being removed in North America than built these days. Most new hydropower projects are taking place in developing countries, including those spread across the Amazon, which is currently experiencing a boom in hydroelectric projects. There are over 4,000 dams in operation, planned or currently under construction within developing countries across Asia, Africa and Latin America, with the majority in the Mekong and Amazon (Moran et al. 2018). Figure 2 shows the current and planned dams in the Amazon and depicts how some of these are in protected areas and indigenous territories. More than 140 dams have already been built in the Amazon and there are 160 dams in various stages of planning (Andersen et al. 2018). These numbers are almost two times higher than what was originally reported for dams in operation or under construction. Peru

has the highest number of current and proposed dams of the four Andean Amazon countries (Andersen et al. 2018). Sixty-five of planned dams are in Brazil, and the country is also investing in developing hydropower resources in Bolivia and Peru in order to export the majority of the energy produced back home (Moran et al. 2018). Hydroelectric power represents 75% of Brazil's energy and Brazil is the second largest producer of hydropower (Fearnside 2017).

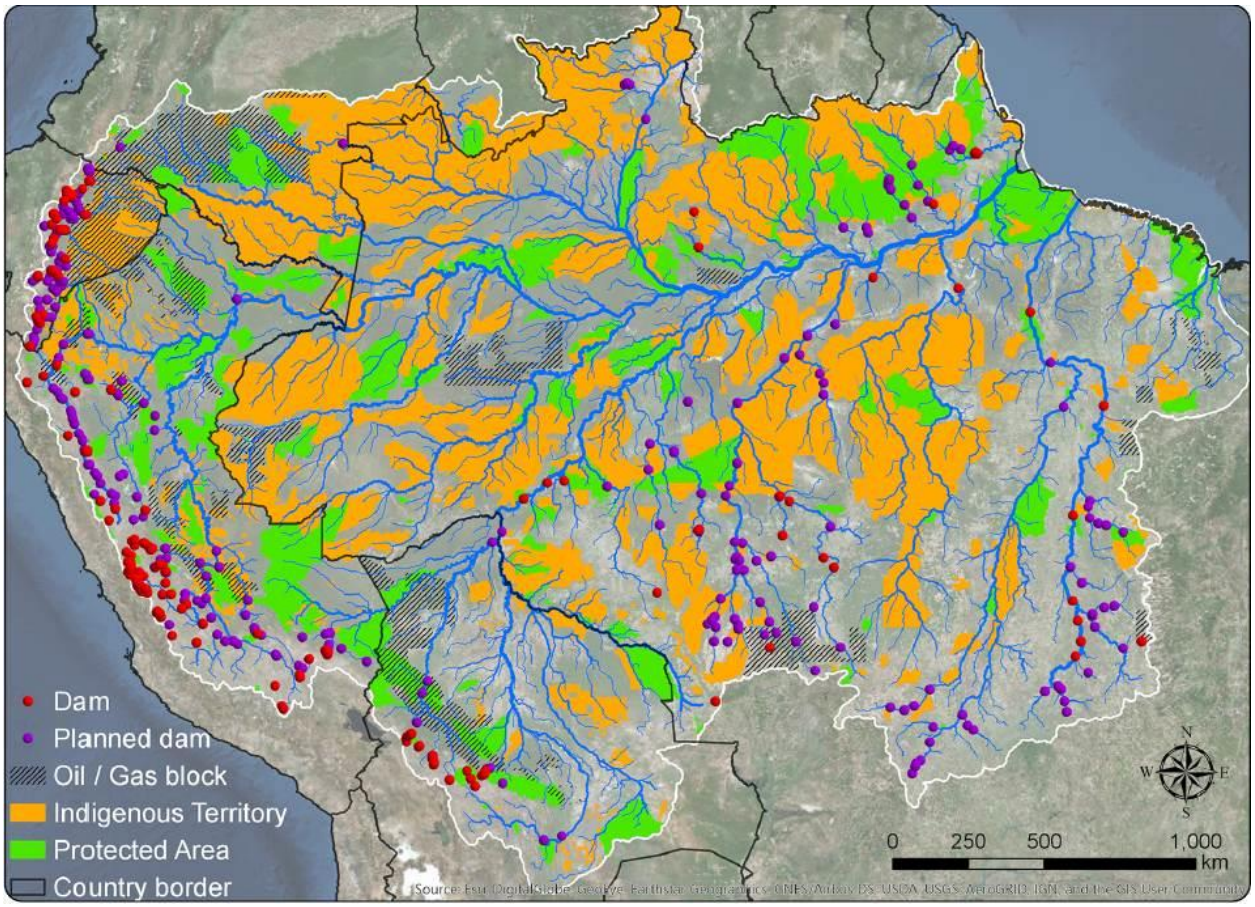

Figure 4. Map depicting the current and planned dams in the Amazon and their location relative to protected areas and indigenous territories.

Source: Anderson et al. 2019

Advocates of these projects tend to overestimate the economic benefits. Despite the narratives that governments in the Amazon use regarding the benefits of dams to help them garner public support, these large-scale projects cause both environmental and social impacts, especially in developing countries. According to a study done by the World Bank, large energy and infrastructure projects are 37% more likely to cause serious environmental and social risks in

developing countries (Gallagher & Yuan 2017). The environmental impacts include disturbance of river ecology and river fragmentation, loss of aquatic and terrestrial biodiversity and habitat, deforestation and the release of substantial greenhouse gases, including methane.

River connectivity is critical in the Amazon, but hydroelectric dams break apart this vital system. Dams prevent sediments and nutrients from moving downriver affecting the productivity of fish, which play an important role in the ecosystem health and local livelihoods (Anderson et al. 2018; Fearnside 2017). Hydroelectric projects also block fish migrations, such as the well-known catfish – dorado – which travels 3,000 miles from the mouth to the headwaters of the Amazon River to spawn and is slowly disappearing as a result of dams (Andersen et al. 2018). There are many other examples since large numbers of fish in the Amazon are migratory. Additionally, the interruption of river connectivity causes changes in seasonal flood dynamics, reduced water quality and increased frequency and intensity of extreme weather events (Castello & Macedo 2016).

Satellite images are used to trace the impacts of hydroelectric projects on the surrounding forest and demonstrate that trees are cleared for the construction of the dam and reservoir instillation. Figure 5 provides a visual of such destruction. For example, the perimeters of infrastructure projects financed by development banks in Ecuador, Peru and Bolivia demonstrated a tree cover loss over four times the average loss in comparable areas without projects in these countries from 2000 to 2015 (Ray et al. 2018). In addition to the dam itself and the reservoir instillation, roads built to reach the dam and along the transmission lines cause further deforestation (Finer and Jenkins 2012). Additionally, more deforestation from dams occurs indirectly from the displaced populations, people moving to the area to work and new roads that spring up within the affected region (Fearnside 2017). Specialists estimate that deforestation in the Amazon will increase by 950,000 hectares by 2032 as result of 12 dams to be constructed on the Tapajos River in Brazil (Barretto et al. 2014).

Figure 5. Image showing the deforestation caused by a hydroelectric dam in the Brazilian Amazon.

Source: Villas-Boas et al. 2015

This deforestation in tropical forests, such as the Amazon, can cause areas to switch from carbon sinks to carbon sources. Furthermore, hydroelectric dams in the tropics exacerbate climate change by emitting up to 2-3 times more emissions than traditional fossil fuels, including gas, oil or coal plants (Barro et al. 2011). Methane is released as a result of the decomposition of plants below the surface of the dam's reservoirs. Tropical dams are associated with higher amounts of methane emissions and additionally, new roads are typically built surrounding the dams, causing more deforestation and carbon losses to the atmosphere (Fearnside 2012).

The social impacts of hydroelectric dams include displacement of people, alteration of people's livelihoods, and impact on the food systems, water quality and agriculture near them. The World Commission on Dams produced a report which showed that 40-80 million people have been

displaced as a result of dams (VanCleef 2016). Freshwater fisheries along with floodplain agriculture and riparian forest products serve as one of the main sources of income for the Amazon's inhabitants (Andersen et al. 2018). However, dams greatly reduce the fish stocks in the affected waters which in turn impact the local communities who are dependent on those resources. For example, as a result of the Tucuruí Dam in the Brazilian Amazon, the fish catch immediately declined by 60% affecting 100,000 people living downstream (Moran et al. 2018). In addition, naturally occurring mercury in the soil transforms into a poisonous methyl form due to the lack of oxygen in reservoirs, which then contaminates the food chain. Local communities who feed on the fish in these areas have unhealthy levels of mercury in their bloodstream (Fearnside 2017). Dams in developing countries serve large industries and urban populations rather than the surrounding communities, who in many cases do not even have access to the power generated from the nearby project and end up paying higher electricity bills.

Even before accounting for negative social and environmental impacts, the actual construction costs of large dams are too high to yield a positive return (Ansar et al. 2014). Due to largely ignored environmental and social costs resulting from dams, the price of dams is so high that most do not have a return on investment (Latrubesse et al. 2017). In fact, in the majority of cases the costs of large dams are 96% higher than predicted costs. For example, the social costs of recent hydroelectric dams in the Amazon resulting from community displacement, water contamination and labor conditions are between $2.1 and $10.5 billion, none of which was included in the predicted costs (Ray et al. 2018).

Multilateral institutions, including the World Bank and the Inter-American Development Bank (IDB) financed many large-scale projects in the 1990s. Their financing continued in the early 2000s, but over time these multilateral development banks switched their focus to environmentally sustainable and small-scale projects reducing the amount of funding available to developing countries for bigger projects. Their funding declined even more after the global financial crisis in 2008. As a result, national development banks from developing countries, such as the Brazilian Development Bank (BNDES) and the Export-Import Bank of China (CHEXIM), have stepped in to fill this funding gap (Vallejo et al. 2018). Figure 6 shows the total amount of financing from each multilateral and national development bank as well as the export credit

agencies in 2013 with China and Brazil both lending more than the World Bank and IDB combined.

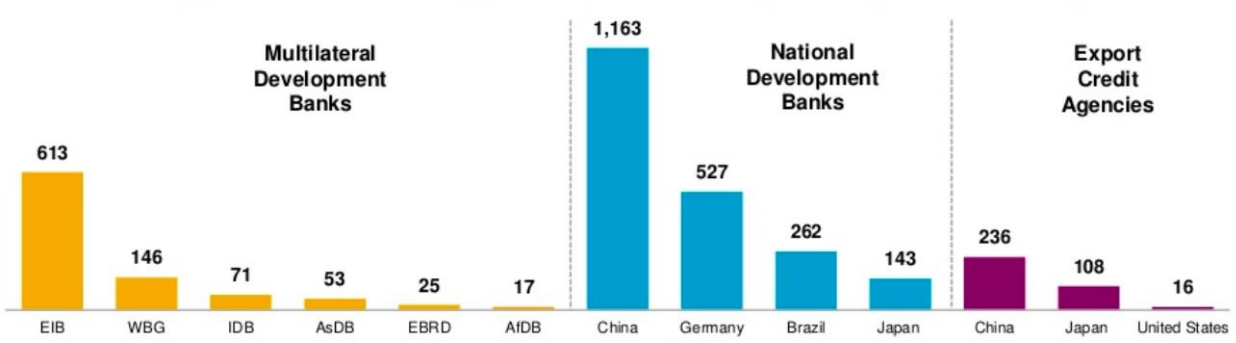

Figure 6. Graph showing the amount of loans granted by the various types of financial institution and the specific banks in 2013 in USD billion.

Source: World Resources Institute 2015

BNDES began overseas investment in 2009 and from 2009-2011 its overseas commitments were over US$1 billion. It is the largest development bank in Latin America by far and an important development partner both for the region and Brazil's own domestic projects. In addition to BNDES, the infrastructure boom in the Amazon is characterized by an increasing role of Chinese banks in financing projects. Since 2007 China Development Bank (CDB) and China Export Import Bank (CHEXIM) have become the largest annual lenders in Latin America (Gallagher & Yuan 2017). The region has therefore seen a shift in its funding sources from the multilateral institutions in the twentieth century to national development banks, especially Brazilian and Chinese, in the twenty-first century.

2.3 Environmental and Social Safeguards

A few tools to mitigate the negative environmental and social impact of infrastructure projects exist. Governments throughout the world have enacted national legislation to prevent unnecessary harm to their citizens and the environment. Financial institutions have created safeguards as conditions of loans to borrowing countries. Lastly, implementing companies have developed codes of conduct to follow throughout the lifecycle of an infrastructure project (Dammert 2018). In large part these tools came about in response to campaigns by communities

affected by projects, partnering with global non-governmental organizations, over the last several decades (Gallagher & Yuan 2017).

Larsen and Ballesteros (2013) define a safeguard as "a rule or institution that helps ensure that investments meet minimum social, environmental and governance standards". Environmental and social safeguards aim to mitigate damage to the environment, minimize social conflict and avoid unethical behavior that can result from projects by presenting a set of regulations, monitoring and reporting procedures to guide recipient countries. As such, they benefit a variety of stakeholders and help reduce costs that could come about from significant issues - environmental or social – stemming from the project. Table 1 outlines the various benefits of safeguards for different stakeholders. In theory, the right safeguards can help meet the timeline of a project, achieve the economic aims of the project, and strengthen the capacity of participating stakeholders when applied and enforced.

Table 1. The benefits of environmental and social safeguards for different stakeholders involved in development.

Stakeholder	Global	Development banks	Borrower governments	Local communities
Benefit	Equitable use of resources Enhancement of global public goods	Greater project effectiveness Mitigation of environmental and social risk Management of reputation risk Realization of broader development goals	Better management of natural resources Strengthening of institutional capacities Mitigation of environmental and social risk Realization of broader development goals	Enhanced voice and ownership Reduced vulnerability Improved livelihoods

Source: Gallagher & Yuan 2017.

In general, there are three buckets of environmental safeguards, including pollution prevention, biodiversity and natural habitats, and climate change mitigation. Within social safeguards there are four areas of concern, which are the rights of indigenous peoples; involuntary resettlement of people; labor, health, and safety; and cultural heritage. Each financial institution determines which areas to cover as part of the safeguards. The way the safeguards system is designed to work is through a five-step process: 1) The safeguards anticipate the social and environmental risks and impacts; 2) The safeguards draw up plans to avoid and/or mitigate the risks; 3) The safeguards manage the implementation of the plans; 4) The safeguards monitor the

implementation; and 5) The safeguards respond to challenges that arise (Larsen & Ballesteros 2013). Safeguards are intended to serve as an accountability mechanism. They are often seen negatively by borrowers for being costly and onerous and positively by civil society organizations for creating protective measures to prevent harm.

Governments often need institutional capacity assistance to successfully implement these safeguards, as well as accountability tools to ensure the safeguards are met. For development banks operating abroad, the project governance and responsibility is shared between the host country and bank. Development banks can employ the safeguards via policies at various phases of the project cycle, including the initial screening, the due diligence prior to approval, the approval decision itself and monitoring throughout project completion (Ray et al. 2018). The recipient government can employ safeguards through national laws and regulations via government agencies, legislative bodies or judicial systems (Larsen & Ballesteros 2013).

While several financial institutions have their own safeguards, governments also enact national legislation to mitigate the environmental and social impacts of infrastructure projects. Many of the countries in the Amazon basin have developed regulations to protect both the environment and respect the rights of communities over the last two decades. In the case of Ecuador and Bolivia, both countries have constitutions that highlight the role of the federal government in ensuring environmental conservation and sustainable development. Ecuador's constitution even recognizes the rights of nature itself. In 2008, Peru created its own Environmental Ministry, which plays an active role in mitigating negative impacts from infrastructure projects.

Importantly, Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela all ratified the International Labor Organization's Convention 169, the Indigenous and Tribal Peoples Convention of 1989. This states that indigenous communities have the right to "decide their own priorities for the process of development as it affects their lives, beliefs, institutions and spiritual well-being and the lands they occupy or otherwise use, and to exercise control, to the extent possible, over their own economic, social and cultural development." It calls on governments to "consult the peoples concerned, through appropriate procedures and in particular through their representative institutions, whenever consideration is being given to legislative or administrative measures which may affect them directly" (Art 6).

Bolivia, Brazil, Ecuador and Peru have also signed the 2007 United Nations Declaration on the Rights of Indigenous Peoples, which states that "Indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free, prior and informed consent (FPIC) of the indigenous peoples concerned and after agreement on just and fair compensation, and where possible, with the option of return" (Art. 10) (Ray et al. 2018). These policies must be followed by financial institutions with projects in countries which have ratified the declaration.

3. Methodology

This chapter outlines the methodology used to carry out the research. The research was conducted through a policy analysis and case studies of two hydroelectric projects in the Amazon: the Coca Codo Sinclair Dam in Ecuador and the Belo Monte Dam in Brazil.

3.1 Policy Analysis

My methodology includes a policy analysis of environmental and social safeguards. I begin with a review of the history and creation of safeguards at the World Bank. The World Bank was the first financial institution to implement safeguards and is considered the most influential for its impact in development finance field. The World Bank's safeguards are considered the gold standard and many banks modelled their environmental and social frameworks after the World Bank. As such, I cover the evolution of safeguards at the World Bank starting in the 1980s and following events until present day analyzing how the extent and quality of the safeguards have changed over time.

Due to a changing geopolitical context and the rise of emerging economies, such as China and Brazil, the approach to safeguards began to shift in the beginning of the 2000s with borrowing countries starting to criticize the stringent regulations of the World Bank. At this time a new way approach to safeguards emerges. I provide an overview of the two approaches to environmental and social safeguards: traditional and country systems. I explain what each one entails and compare the two of them. I provide a critical analysis of the different safeguards, highlightling the advantages and disadvantages of each.

I finish my policy analysis with a comparison of the safeguards of nine different financial institutions operating in Latin America today. These institutions can be grouped as such: multilateral development banks based in the North, developing countries' national development banks, and sub-regional development banks. I note which safeguard approach (traditional or country systems) each financial institution uses. I discuss the environmental and social safeguard themes that each bank covers from pollution prevention to rights of indigenous peoples. In this comparison, I show the operation procedure requirements for the different institutions as well as which ones have accountability mechanisms. Bank transparency and information disclosure varies by financial institution and I cover which banks have these policies in their guidelines. Lastly, I cover which banks have an exclusion criteria to prevent certain risky projects from going forward.

3.2 Case Studies

My methodology also applies a case study approach to compare two hydroelectric dams in the Amazon that were financed by different banks: the Coca Codo Sinclair Dam in Ecuador and the Belo Monte Dam in Brazil. For each case study, I give an overview of the project and its location followed by a history of how the project came about. Multilateral development banks, including the World Bank and Inter-American Development Bank, originally agreed to finance both the Coca Codo Sinclair Dam and the Belo Monte Dam in the 1980s. However, once feasibility studies were concluded and protests broke out, the environmental and social risks became obvious, resulting in the banks declining financial support. With no funding available, both projects were put on hold for a couple of decades until new financial institutions came online from China and Brazil. China financed the Coca Codo Sinclair Dam and Brazil financed the Belo Monte Dam.

I provide detailed information on the social and environmental impacts of the dams on the surrounding environment and local communities. The variables I analyzed include deforestation, biodiversity loss, land cover change, disruption of river ecology and fragmentation, displacement of communities, health issues, loss of livelihoods, economic hardships, increased crime, and higher electricity bills.

In the case studies, I analyze how each of the financial institutions, the Export Import Bank of China (CHEXIM) and the Brazilian Development Bank (BNDES), adhered to (or not) environmental and social safeguards throughout the lifecycle of the projects. In this part, I apply the policy evaluation component to assess if the safeguards succeeded or not. I critically discuss how well the financial institutions complied with their own policies and the national legislation of the borrowing countries as well as the subsequent consequences this had on both the environment and local communities.

4. Policy Analysis

Chapter four consists of the policy analysis of environmental and social safeguards. The section begins by looking at the emergence of safeguards within the World Bank, which was the dominant global financial institution in the twentieth century. Following the history of safeguards, the two approaches – traditional and country systems – are described and compared to one another. The section ends with a comparison of the safeguards of nine financial institutions currently lending to Latin American countries.

4.1 Evolution of safeguards through World Bank

Currently all international development banks operating in Latin America consider environmental and social concerns as part of their decision-making. However, before the 1980s there was no formal incorporation of these concerns in project finance. The World Bank and other lenders did not have their own safeguards and instead relied on the national legislation of borrowing countries.

Some of the first progress in this area came about toward the end of the twentieth century. The 1980s and 1990s mark the inception of environmental and social safeguards when local communities affected by projects partnered with global NGOs to pressure banks and governments to consider their concerns. For example, the World Bank financed the 1,500 km-long Polonoroeste BR-364 highway in the Brazilian Amazon, and it resulted in deforestation, land conflicts, disease, and crime. In response, a large coalition formed and lobbied against the bank for the adverse social and environmental effects brought about by this project.

Environmental degradation and human suffering around the globe caused by large-scale projects financed by the World Bank, such as the Polonoroeste Highway and the Narmada Dam in India, and other multilateral development banks resulted in a large uprising of civil society internationally. Environmental and social activists worldwide lobbied for changes in multilateral development bank policies. As a result, the World Bank began to formulate its own safeguards in the 1980s, which took the form of an Operational Manual Statement on Environmental Aspects of the bank's work published in 1984. This statement outlined the bank's policies and procedures relating to projects and other components of its work that could affect the environment. Operational directives then replaced the Operational Manual Statements starting in 1987. Five years later, 11 operational policies and bank procedures, which provided protections for certain groups and resources, replaced the operational directives in 1992 (World Bank 2012). The safeguards focused mainly on the environment but included some social coverage. The World Bank also developed its own inspection panel for project-affected individuals to bring claims of non-compliance in 1993 (Dann & Riegner 2019).

At the same time, the U.S. Congress passed the Pelosi Amendment in the early 1990s. This amendment required funders to review development projects' potential environmental impacts and make environmental assessments available publicly. The U.S was a shareholder and funder of multilateral development banks, so this amendment led to restructuring the practices of international financial institutions (Dann & Riegner 2019).

The World Bank's initials safeguards spread into the laws and practices of other multilateral development banks, such as the Inter-American Development Bank, the Asian Development Bank, the African Development Bank, and the European Bank for Reconstruction and Development, all of which modelled their standards on those of the World Bank. For example, the Inter-American Development Bank published statements with similar items to the World Bank's operational policies in 1991 and its safeguard principles were codified in 1996. These banks developed accountability mechanisms too. Countries also began to adopt new laws influenced by the World Bank (Dann & Riegner 2019).

Around the same time, in 1991, there was a public-private finance initiative between the UN Environmental Program and the private banking sector which ultimately led to the Equator

Principles in July 2006. These principles emulate the practices and guidelines of the World Bank; they can be adopted and applied to development projects costing more than $10 million USD on a voluntary basis (Gallagher & Yuan 2017).

With the adoption of safeguards within the multilateral development banks, borrowing countries had to abide by both their own legislation as well as the policies of the banks in order to obtain and continue to receive funding. In the case that a borrowing country's own law was not up to par with the bank's norms, that country chose between forgoing the loan or raising its national standards. However, implementation of the safeguards fell solely on the borrowing countries and monitoring was difficult given the large number of projects. The global mobilizations also resulted in governments adopting a series of environmental and social safeguards. Many countries modeled their own laws on World Bank standards, including the environmental impact assessment. However, the adoption of safeguards has been slower and more difficult in developing countries (Dann & Riegner 2019).

In 2005, the World Bank adopted a new approach of "use of country systems," which allowed a borrowing country to utilize its own legislation if it was in line with the safeguards of the bank. However, this only applied to pilot projects under restrictive conditions of OP 4.01 (Environmental Assessments) and was used very rarely due to the fact that most countries did not have such stringent policies (Dann & Riegner 2019).

In 2012 the World Bank set out to reform its safeguards in part due to criticism the bank had received (Dann & Riegner 2019). World Bank borrowers commonly complain that environmental and social safeguards are strictly imposed without providing capacity-building components to the loans. They were deemed as bureaucratic, slow, costly, and too much of an imposition. Projects in Latin America going through the World Bank have an average approval time of 14 months and an estimated cost of 3% of the total project budget. A World Bank survey conducted with 100+ stakeholders showed that in Latin America 60% of initially proposed large-scale projects were avoided by clients due to safeguard systems (Gallagher & Yuan 2017).

At the same time, the economies of several developing countries, including the BRICS, began to grow increasingly and take a greater share of the global economy demonstrating more political influence within international finance. These countries mobilized domestic capital for investment

at home. After the global financial crisis in 2008, the World Bank and other multilaterals reduced funding. In their place, national development banks from China and Brazil emerged to fill this role. Figure 7 shows the increased financing provided by the BRICS countries from 1980-2013. For example, Brazil invested $10 billion in International Monetary Fund bonds during the financial crisis of the late 2000s. Also, the Brazilian Development Bank disbursed about $100 million USD in 2010, while the World Bank disbursed $40 million USD the same year. These new large economies are creating their own approaches to development cooperation as well as environmental and social issues in an effort to resist the normative frameworks of the multilaterals. For example, Brazil, China and India promote a developmental state as opposed to the Washington Consensus-type development model and become development donors themselves. They underscore sovereignty in the relations with their borrowers, steering clear of intervention measures and instead providing an alternative to the strict conditionalities of traditional donors (Dann & Riegner 2019).

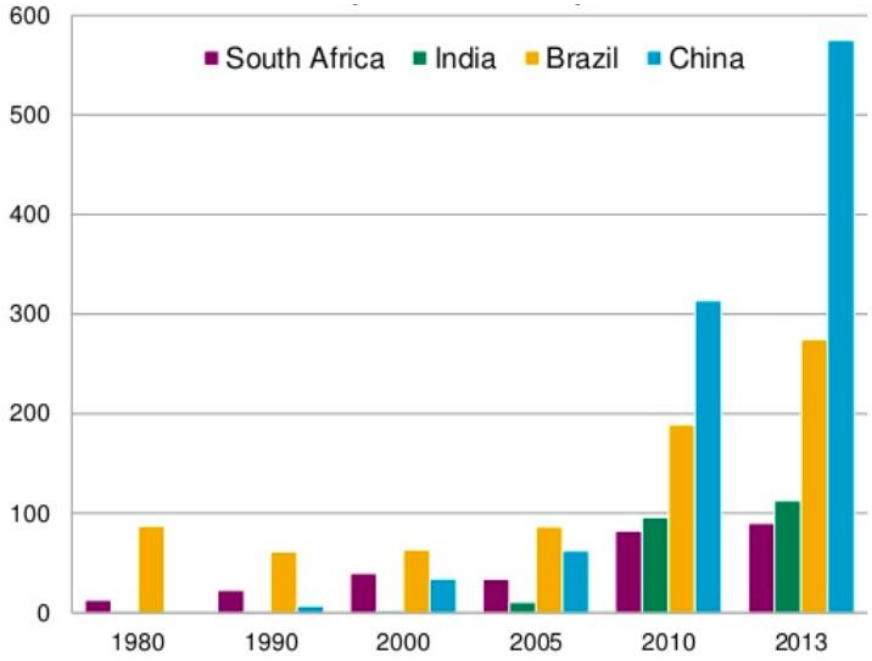

Figure 7. Graph showing the global outward foreign direct investment stock from four emerging economies in USD billion.

Source: Zhou & Leung 2015

The World Bank reforms took four years during which time intergovernmental negotiations and three public consultation rounds occurred. As part of the consultations rounds, the evaluators

spoke to government representatives, civil society organizations, indigenous groups, academia, and others on the various aspects of the new safeguards. Civil society organizations and donor states wanted to maintain the level of rigor of the original safeguards; whereas, borrower states wanted more flexibility for the implementation and more autonomy to use their own national legal systems. The reform resulted in a unified legal text, the Environmental and Social Framework, representing an integrated framework composed of a vision statement, an environmental and social policy and ten environmental and social standards. The vision statement is completely new. The environmental and social policy states the responsibilities of the World Bank and the environmental and social standards outline the obligations of the borrowers. Procedural rules regarding the Environmental Impact Assessment (EIA) now includes social impacts. The standards on land acquisition and resettlement, biodiversity, indigenous peoples carried over from the original safeguards with some modifications. The new standards include labor and working conditions, resource efficiency, environmental pollution, and climate change in addition to the health and security of project-affected communities. The World Bank's new standards are not directly legally binding on the borrowing country but require that certain conditions be met before concluding a loan agreement. The safeguards then become legally binding once they are included in the loan agreements resulting in an Environmental and Social Commitment Plan. This is the same process as the original safeguards. The new framework was approved in August 2016 and went into effect in 2018 (Dann & Riegner 2019). Figure 8 shows a complete timeline of the World Bank's safeguards.

These updates make it much easier to replace some or all safeguards with the borrower's national law. The participation of stakeholders is now required throughout the entire project cycle, including the implementation phase with these new safeguards. The borrower must also institute a project-based grievance mechanism. The big difference between these new safeguards and the original ones is that instead of following the policies of the World Bank, the borrowing government can use its own laws to manage the environmental and social impacts of a project (Gallagher & Yuan 2017). Another change is that the application of the framework can be different depending on who the borrower is by using the country systems approach. During the safeguard reform negotiations, China, India, Brazil and South Africa advocated the most for the use of country systems. Under the new safeguards, in order to use the country systems approach, the borrower's standards need to have "objectives materially consistent with" the World Bank's

safeguards (Dann & Riegner 2019). Some may argue that national law in many countries can handle the impacts of the difficult projects better than 20 years ago due to the influence of the World Bank's standards on the legal systems of the countries in which it financed projects.

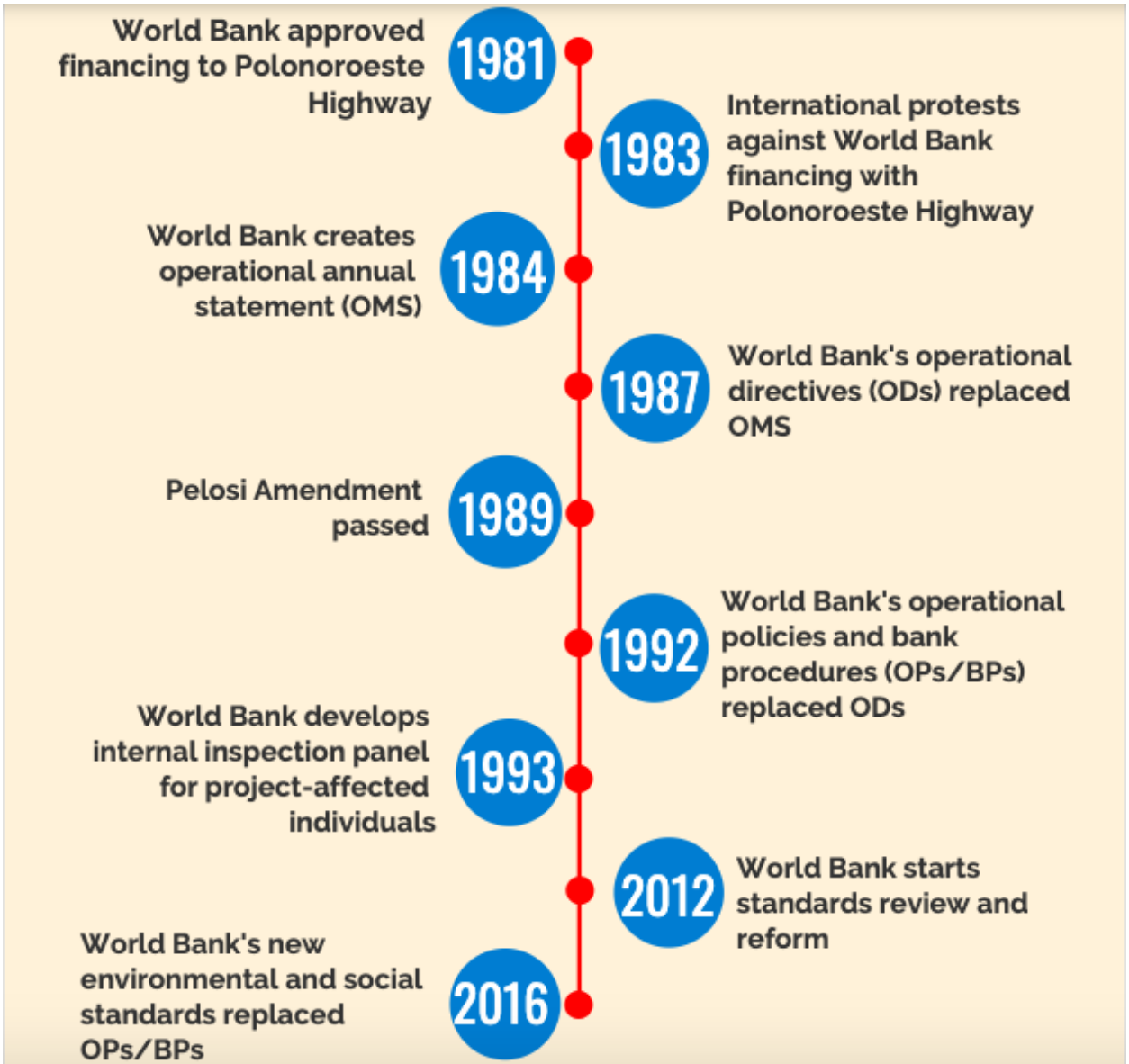

Figure 8. Timeline outlining the events related to the evolution of environmental and social safeguards at the World Bank.

Source: Author

The World Bank's dominance around the globe has started to wane as new players emerge from developing countries, especially China and Brazil. China's outward foreign direct investment

increased from below $1.2 billion in 1990 to $94.6 billion in 2013 (World Resources Institute). Just in 2009 and 2010, China's Export Import Bank and its Development Bank lent more than the World Bank did to developing countries around the world. Similarly, BNDES, the national development bank of Brazil, gives more loans in Latin America than the World Bank and the Inter-American Development Bank combined (Herbertson 2012). The development banks from China and Brazil rely on a very different approach to safeguards than the World Bank and other multilaterals in that they essentially defer to the legislation of the borrowing country and have no safeguards of their own.

4.2 Traditional approach versus country systems approach

Environmental and social safeguards across development banks range from a required set of international standards to total deference to the country systems of recipient nations. There are two principal approaches to safeguards: the traditional approach and the country systems approach, which is the terminology used in the literature (Larsen & Ballesteros 2013). In the traditional approach, the development bank has its own safeguards which must be followed by the bank and host country in order to receive funding. A lot of banks have safeguard policies if they are investing in developing countries to minimize the risk that their investments violate minimum social and environmental standards. Traditional safeguards have specific procedural and substantive requirements that must be followed by bank staff and borrowing governments in order to receive funding. Conversely, in the country systems approach, the development bank defers to the safeguards and institutions of the host country if they are as strong as those of the bank. Given the changing development finance scene, some lenders are now relying on the legal and institutional systems of the host country to implement more effective safeguard protections. Although the approaches are quite different, both of them rely on the host country for the daily implementation of the safeguards (Larsen & Ballesteros 2013).

When safeguards first came about, the decisions surrounding investments at international finance institutions were greatly influenced by developed countries. The first approach to safeguards at this time was the traditional approach, which entailed detailed steps and procedures that must be followed by the borrowing government in order to minimize the environmental and social risks of development projects. This model was in place over the last several decades and has been

successful with specific projects in which the financial institution could mandate certain safeguards, such as environmental impact assessments, before construction started (Herbertson 2012). Both dams and roads have had their impacts mitigated through application of the traditional approach.

However, this is changing now with emerging economies (Brazil, China, India) making contributions to development finance, which has become more complex. As a result, recipient countries are advocating for more autonomy over the development process, including safeguards, and advocating for the country systems approach. New financial institutions are changing the way they provide funding to developing countries and how they apply safeguards. Several lenders offer funds in new and different ways to help promote more country ownership over the development process. One such prominent way is allowing borrowers to follow their own domestic rules and utilize their own local institutions to mitigate environmental and social impacts of development projects instead of requiring that they adhere to a strict set of procedures (Herbertson 2012).

This new approach has both advantages and disadvantages. By allowing recipient governments to rely on their own safeguards, local laws and institutions can be strengthened resulting in more sustainable growth. However, this is more of a long-term process and in the interim, there is a high risk of poorer development outcomes if only the safeguards of the borrowing governments are used. Additionally, numerous countries do not have sufficient laws, enforcement ability, or even the political will to protect their own people and environment when it comes to development projects (Herbertson 2012). In some cases, costly delays and even total project shutdowns resulting from environmental and social issues can occur when relying solely on the country systems approach (Gallagher & Yuan 2017). On the other hand, the strictest standards are often criticized as greenwashing or for slowing down the project cycle or turning potential borrowers away from financial institutions with such standards.

Previous experiences with use of country systems shows that national regulations and processes are not as protective as the World Bank standards. Also, there is no guarantee of effective law enforcement and compliance with rule of law principles within this approach. Today the World

Bank awards less environmentally risky projects due to its safeguards, which until recently followed the traditional approach.

4.3 Comparison of safeguards by financial institution

Across the variety of development banks operating in the region, including multilateral, national, and private-sector windows, there are different approaches to environmental and social safeguards. Multilateral development banks based in the North (World Bank, IDB) have strengthened their safeguards over time as described above and have the highest standards and strictest safeguards of all the financial institutions. This means that they have rigorous policies that must be followed by the borrowing country regardless of that particular country's national standards. The conditions placed on their loans follow and aim for harmonized global standards. Within these banks, there are public-sector lending windows, such as the International Bank of Reconstruction and Development (IBRD), which can offer concessional financing as well as grants to borrowers who struggle to meet the high standards (Ray et al. 2018).

Conversely, developing countries' national development banks have the lowest standards of all the financial institutions. These banks typically follow the standards used by borrowing countries, but they do not require that the countries meet these standards as a condition of the loan. In addition, national development banks do not offer assistance to help the borrowing countries meet their standards. Chinese development banks, such as the Export-Import Bank of China (Chexim), fall within this category and are largely deferential to host country standards (Ray et al. 2018). The other banks include: Agence Francaise de Developpement (AFD), Brazilian Development Bank (BNDES), China Development Bank (CDB), KfW Development Bank (KfW) and the Export-Import Bank of the United States (US EXIM). The national development banks of China and Brazil have not applied safeguards to their loans abroad, except in very few cases. Instead, they follow the laws of borrowing countries and leave the environmental and social concerns under the management of the host government (Herbertson 2012).

Private-sector windows of the Northern-based multilateral development banks, the International Finance Corporation (IFC) and the Inter-American Investment Corporation (IIC), fall in between multilateral development banks and national development banks in regard to their standards and

stringency of safeguards. The conditions they place on their loans also follow and aim for harmonized global standards. The difference between the private-sector windows and multilateral development banks is that the former does not offer assistance to borrowing countries to help them reach their own standards (Ray et al. 2018.)

There are also sub-regional development banks, including the Development Bank of Latin America (CAF), the European Investment Bank (EIB) and the Caribbean Development Bank (CaDB). CAF is an important player in the region and has its own approach to safeguards. CAF defers to the national standards of the borrowing country and also offers concessional finance when needed for public-sector borrowers to meet their own standards (Ray et al. 2018).

Environmental and social safeguards cover various themes, including pollution prevention, biodiversity/natural habitats, climate change mitigation, right of indigenous peoples, involuntary resettlement of people, labor/health/safety, and cultural heritage. The thematic coverage for environmental and social safeguards varies across the banks, but the main variation falls in two areas: climate change and labor/health/security. All of the banks, except for CHEXIM and CAF have included climate change within their safeguard policies. Similarly, most of the banks, except for the World Bank, IDB and CAF, cover labor/health/safety issues. Two banks, BNDES and CDB, do not mention themes they cover in environmental assessments (Gallagher & Yuan 2017).

Regarding operational procedure requirements for environmental and social safeguards, there are only two items which all of the banks follow. The first is that all of these banks require environmental impact assessments at the pre-lending stage, and the second is that all banks mandate that projects meet the environmental standards of the host country. The multilateral development banks (World Bank and IDB), as well as several of the national and sub regional development banks (US EXIM, EIB, AFD and KfW) require borrowing countries to comply with international standards through mandated safeguards. The five other banks defer to the host country rules. However, only three of the banks, including CAF, IDB, and IBRD offer concessional loans when needed to help borrowing countries meet those standards. The multilateral development banks and their private-sector windows, such as IFC and IIC, rely on their own standards, including prior consultation protections in all cases and grievance

mechanisms in most cases. Over the last decade, multilateral development banks have also enacted the policy of free, prior, and informed consent of affected indigenous communities by mandating this as a required practice for approval of the loan (Ray et al. 2018).

The multilateral development banks, sub-regional banks and three of the national banks include public consultations with affected communities in their environmental assessment. The two which do not are CDB and BNDES. Only three of all the banks have project-level grievance mechanisms: World Bank, AFD, and EIB. However, only two banks (World Bank and US EXIM) mandate independent monitoring and a review of environmental compliance, even though all of the banks have links between the compliance of environmental regulations and disbursement. All of the banks except for three, IDB, KfW and BNDES, require an ex-post environmental impact assessment.

Bank transparency and information disclosure is also a critical component of safeguards. Seven of the banks have policies on transparency that allow all people to view the environmental assessments of specific projects. The World Bank and IDB have online databases that provide environmental assessment reports for each individual project. Conversely, CHEXIM, CDB, and CAF do not have such transparency and do not have an information disclosure policy.

The World Bank's safeguards are considered the gold standard and other financial institutions, including EIB, IDB, US EXIM, CaDB, KfW, and AFD have harmonized their standards with those of the World Bank. Alternatively, CHEXIM and BNDES developed their own guidelines to handle environmental and social concerns, but they do not have many requirements for their lending.

Banks can implement an exclusion criteria in order to weed out the environmentally and socially risky projects from their funding. The IDB, CaDB, US EXIM, EIB, KfW, and AFD all utilize this type of criteria in addition to their environmental and social safeguards. Four of the banks, including CAF, BNDES, CDB, and CHEXIM, do not have an exclusion criteria. The World Bank uses its own policy on procurements and the "Multilateral Development Bank Harmonised Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer" to exclude specific projects (Gallagher & Yuan 2017).

In sum, the multilateral development banks and Western national development banks have the highest standards required for all projects. Conversely, the developing country national development banks from Brazil and China offer the least amount of environmental and social protection by relying on the rules of borrowing countries with no monitoring for compliance system or assistance to support compliance. Between the two extremes are KfW, AFD, CAF, and CaDB, which include some international standards for the application of safeguards but in general employ a more flexible approach to safeguards.

5. Case Studies

This section continues with the analysis through two case studies: the Coca Codo Sinclair Dam in Ecuador and the Belo Monte Dam in Brazil. Both case studies begin with an overview of the hydroelectric project and its location in the Amazon, followed by a detailed history of the project. The case studies include the environmental and social impacts caused by the dams and an analysis of the financial institutions' compliance with safeguards.

5.1 Coca Codo Sinclair Dam in Ecuador

The Coca Codo Sinclair hydroelectric project is Ecuador's largest hydroelectric dam. The dam became operational in November 2016 and runs at only 50% of its estimated 1,500 MW capacity (Vallejo et al. 2018). The total cost of the dam came in at $2.8 billion USD, with eighty percent of the costs financed by the Export-Import Bank of China (CHEXIM). Ecuadorian laws were disregarded by both government officials and CHEXIM to move the project forward, resulting in devastating consequences for the environment and local communities.

5.1.1 Project location

The Coca Codo Sinclair dam lies within a heavily forested area of the Ecuadorian Amazon on the Coca River within the Napo River watershed (Vallejo et al. 2018). There are several protected areas, including the UNESCO Sumaco Biosphere Reserve, within the area of influence of the dam, which totals close to 40,000 hectares (Lopez). Although there are no indigenous territories in this region, there are numerous traditional communities. The project is also close to an active volcano, El Reventador, which has erupted continuously over the last decade. Figure 9

provides a map of the region showing the location of the dam and the surrounding protected areas and forests as well as the volcano.

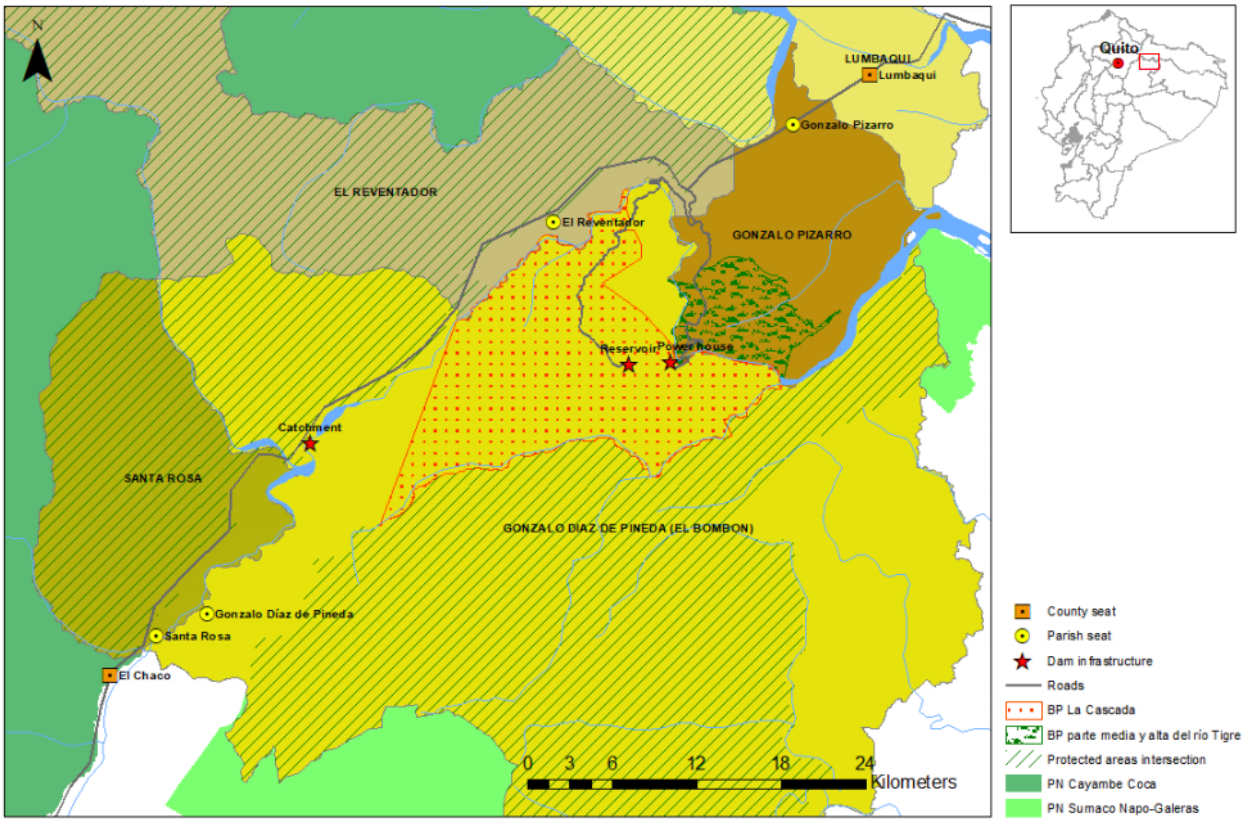

Figure 9. Map of the location of the Coca Codo Sinclair Dam and the surrounding protected forests and protected areas.

Source: Vallejo et al. 2018

5.1.2 Project history

Plans to construct a dam in the region began in the 1970s with initial studies on the hydro-energetic potential of the Napo River Watershed. The prefeasibility study was concluded by HIDROSERVICE in 1976 and the feasibility study by Italian consultants and the Ecuadorian Institute of Electricity (INECEL) in 1992. Using the registered flow calculations from 1972-1990 as their base, the results of the studies suggested a project close to 1,000 MW operating capacity with two units. Although the Inter-American Development Bank (IDB) had originally agreed to finance the dam, it backed out once feasibility studies concluded in 1992 due to the dam's proximity to the active Reventador Volcano. The project was considered too risky given the volcano's eruption in 1987 and the impact it could have on the structural integrity of the dam and

power lines (Vallejo et al. 2018). With no funding, plans for the project were put on hold for several decades.

Rafael Correa became the the President of Ecuador in 2007 and brought with him a new vision for the country. A self-declared socialist, Correa despised the western-backed development institutions and looked to China to bring in investment to finance his lofty goals. During the first year of his presidency, he created Ecuador's 2007 Master Electrification Plan, which aimed to replace energy generated from fossil fuels with hydroelectric energy in order to achieve self-sufficient renewable energy production. Although, the plan also intended to import additional energy from Peru and Colombia (Power Technology). Ecuador's Master Electrification Plan aspired to have one of the cleanest energy matrices in the world through the construction of eight dams (all financed by China), including Coca Codo Sinclair (Garzon). As a result of this plan, President Correa declared Coca Codo Sinclair a priority and placed it under the responsibility of the National Electricity Council (CONELEC) to move it forward. This dam in particular was expected to supply 44% of Ecuador's electricity needs.

That same year, the government of Ecuador created the Ministry of Electricity and Renewable Energy (MEER) in July 2007 to promote the project under the leadership of Minister Alecksey Mosquera. Additionally, President Correa issued Executive Decree 655 in October 2007, which stated that at the request of the Board and Executive Director of CONELEC, he could declare high-priority electric projects in special areas (protected areas) if they had feasibility studies done already (Lopez 2008). Coca Codo Sinclair was one such high-priority project.

Instead of conducting a new feasibility study, the 1992 feasibility studies were redesigned to reach 1,500 MW (twice the original amount) with a run-of-river design using flow from the San Rafael Waterfall in the preliminary Environmental Impact Assessment (EIA). The EIA was conducted between September 2007-March 2008 by Entrix, the contractor of Termopichincha, Ecuador's state-owned power company in charge of the project (Lopez). The redesign overestimated water availability in the region to power the dam since it was based on hydrological data close to thirty years old (Teravainen 2019). The dam's former general manager, Luciano Cepeda, declared that top Ecuadorian officials pushed ahead not wanting to

waste time with a new study (Casey & Krauss 2018). Despite the outdated data used, the preliminary EIA was approved in one week by CONELEC in the beginning of April 2008. This one-week approval represented a record approval time by this government agency.
President Correa and the former Argentinian President Cristina Fernandez developed a joint venture between Termopichincha and Argentina's company, Energia Argentina (Enarsa), in April 2008. This resulted in the creation of Compania Hidroelectrica Coca Coda Sinclair S.A. (70% owned by Termopichincha and 30% owned by Enarsa). At the same time, MEER promoted the dam in the affected region. MEER's strategy to reduce any local opposition to the dam was to make the mayors of the two municipalities surrounding the project site – El Chaco and Gonzalo Pizarro – deal with the demands of local inhabitants. To do so, they separately signed two cooperation agreements between MEER and the municipal government of El Chaco in January 2008 and the municipal government of Gonzalo Pizarro in February 2008 (Lopez 2009). The agreements outlined goals to educate the local population, build a health center, and improve cooperation across the various governance institutions.

While MEER was working at the local level through the agreements with the municipal governments, Termopichincha continued managing Coca Codo Sinclair by working to hire a consultant to elaborate and socialize the terms of reference of the definitive EIA. They hired Entrix, who with Coca Codo Sinclair S.A., held public consultations in the affected region after local residents and local governments pressured them to do so. As part of this process, they presented the terms of references of the definitive EIA to community members in El Chaco and Lumbaqui from May-June 2008. In the beginning of October 2008, Coca Codo Sinclair S.A. announced the bidding of the definitive EIA.

President Correa inaugurated the construction of the project on April 29, 2008 in the Simon Bolivar compound of the Gonzalo Pizarro municipality to the surprise of local residents who learned that the project had an eight-month old contract with a private construction company, FOPECA S.A., already. This demonstrated unusual speed in public contracting processes and non-compliance with the environmental licensing processes. The construction was to build an access road to the power station, and it never had an EIA conducted or environmental license granted even though the road went through a protected area and Ecuadorian law requires an

environmental license before construction can begin. Construction started in May 2008 and since the government had declared the dam a national priority, no one could do anything to stop it (Vallejo et al. 2018).

At the time of the initial construction, the advocates of the Coca Codo Sinclair dam did not know of the agreements between MEER and the municipal governments. They tried to get close to the local actors directly by promising to employ the locals in the projects. The local populations and municipal governments demanded an EIA, environmental license, and monitoring system of the project.

A comprehensive assessment of the entire project never occurred and instead two separate EIAs took place: one for the dam and one for the power lines. The definitive environmental impact assessment on the dam was conducted by Efficacitas, a consulting firm, in 2009. It was submitted mid-2009 along with the environmental management plan to retain the environmental license. Basic activities, such as biological monitoring and chemical changes in the system, were never covered in the EIA or other plans. Although the Reventador Volcano had been erupting continuously since 2002 and the project site is close to a large geological fault line that was the epicenter of a 6.9 earthquake in 1987, the contingency plans in the EIA related to seismic and volcanic risks were unclear (Vallejo et al. 2018). There were no public consultations or social participation involved in the process. Previously, they had created a commission of workers in the Ministry of Environment from the central plant to follow up on the project, excluding the regional workers from Napo and Sucumbios, who were responsible for the local protected areas (Lopez).

With the EIA approved, Hogan & Hartson, a law firm based in Washington D.C., prepared the bid documents for the project in 2009. That same year, Ecuador started negotiations with Sinohydro Corporation, a Chinese construction company, which gave the government access to Chinese financing (Vallejo et al. 2018). The Ecuadorian government went to the Export-Import Bank of China (CHEXIM) for financing and the bank agreed to support both the dam and the transmission lines (Ray et al. 2018). Importantly, the deal between China and Ecuador required that Ecuador hire a Chinese construction firm as the general contractor. As a result, the

engineering, construction and procurement contract was awarded to the Sinohydro-Andes JV consortium in October 2009. This consortium consists of Sinohydro (89%), the Ecuadorian company Coandes (8%), the Chinese consulting company Yellow River Engineering (1.5%), and the Italian consulting company Geodata (1.5%). At the same time, in September 2009, Argentina sold its share of the joint venture to Ecuador for $5.5 million USD (Teravainen 2019).

The cost of the project increased to $2.8 billion USD, triple the estimate provided by a study completed by the Federal Electricity Commission of Mexico. In May 2010, the government of Ecuador signed a contract with CHEXIM for $1.683 billion USD with 6.9% interest rates over 15 years (Vallejo et al. 2018). CHEXIM provided 85% of the total costs and the remaining funds came from the Ecuadorian government using both debt (63%) and equity (37%). The interest alone costs Ecuador $125 million annually. As a result, almost 80% of Ecuador's oil exports, key to the country's economy, are sent to China to repay loans for at least five years (Kliman et al. 2019). That same year, the state-owned company Coca Codo Sinclair EP was established for the project's development and Coca Codo Sinclair S.A. was transferred to the national government of Ecuador within the state-owned company Corporación Eléctrica del Ecuador (CELEC) (Teravainen 2019).

Construction on the dam began in August 2010 and lasted for six years. More than 14,000 people were hired during construction. Twenty percent of the manual labor consisted of foreigners (mainly Chinese), while 40% were hired from the area of influence even though Sinohydro promised to hire 70% during the process to inform the public about the project. There were no incentives or trainings offered to local residents so they could provide services to Sinohydro (Vallejo et al. 2018). Additionally, when work on water intake and transmission lines was underway, community monitoring was assigned to Coca Codo Sinclair S.A., creating a conflict of interests. Even though Ecuador has laws to ensure transparency in public administration, there was almost no available information on the environmental audits and work supervision was completely restricted (Vallejo et al. 2018). After six years of construction, the Coca Codo Sinclair Dam came online in November 2016. Figure 10 provides a timeline of major events throughout the development of the dam.

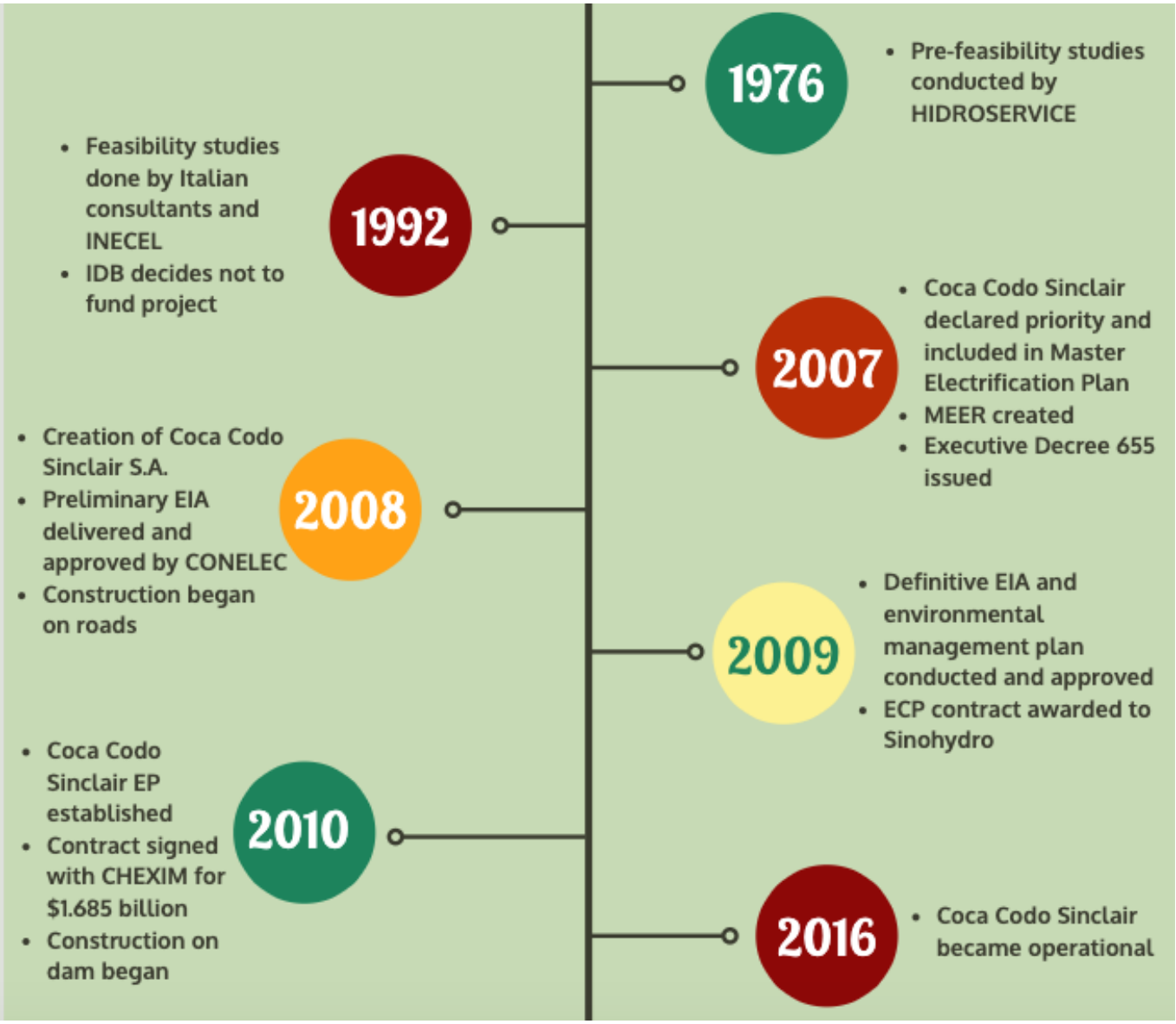

Figure 10. Timeline of major events related to the Coca Codo Sinclair Dam.

Source: Author

Investigations into the project have resulted in various criminal charges demonstrating that corruption played a critical role in the advancement of the Coca Codo Sinclair Dam. Close to all the high-level Ecuadorian officials involved in the dam's construction, including the previous vice president, a former electricity minister and ironically, the anti-corruption official monitoring the project, are in jail or sentenced on bribery charges. The later was exposed by a recording in which he discussed Chinese bribes. Ecuador's previous president, Rafael Correa, who prioritized the Coca Codo Sinclair Dam from the beginning of his term, fled the country and lives in exile in

Belgium after being found guilty of accepting funds from companies for his election campaign in exchange for contracts (Casey & Krauss 2018). Although the environmental and social risks of the dam were obvious and voiced repeatedly, a web of corruption allowed the project to move forward to completion.

5.1.3 Social and environmental impacts of the project

The area of influence of the dam includes protected areas, including reserves, protected forests, and national parks. The Coca Codo Sinclair dam caused damage to the surrounding environment through deforestation, aquatic biodiversity loss, increased sedimentation, and reduced water flow. The social impacts have affected thousands and include loss of livelihoods and economic hardships as well as serious issues regarding the occupational health and safety of the project's workers. Figure 11 provides a consolidated view of all the impacts caused by the dam.

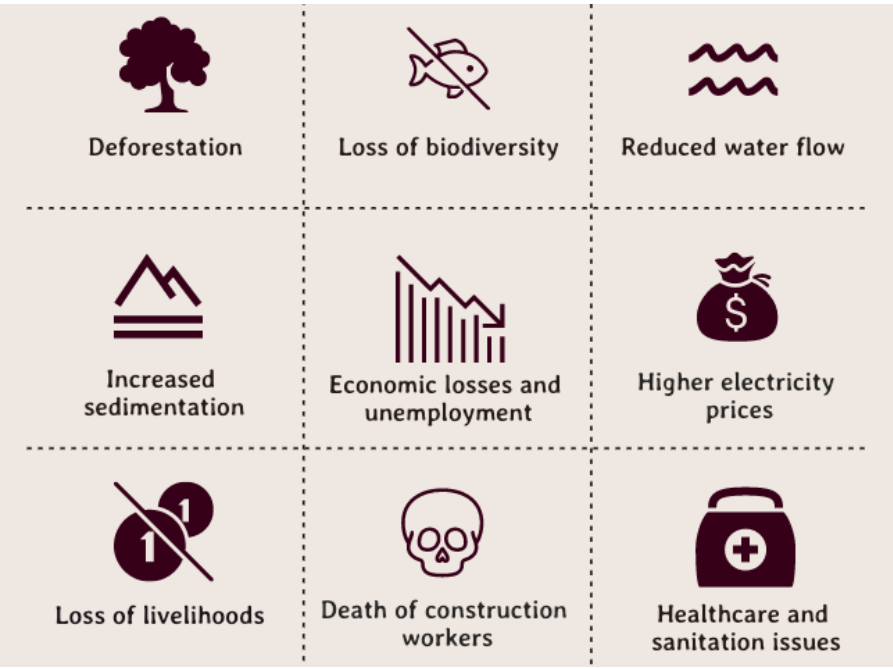

Figure 11. The environmental and social impacts caused by the Coca Codo Sinclair Dam in Ecuador.

Source: Author

The impacted area extends over 40,000 hectares directly affecting 2,000 people. The environmental damage includes sedimentation, reduced fish stocks downstream, and reduced water flow, including at the San Rafael waterfall (Ray et al. 2018). Sedimentation has increased

upstream while the water flow below the dam has reduced significantly impacting fish stocks. The San Rafael Waterfall, the tallest in Ecuador, has essentially gone dry as a result of the dam (Power Technology). Silting is also a large problem in the reservoir, which is currently overrun by bushes and trees.

Figure 12. A photo showing the power lines cutting through protected Amazonian forest.

Source: Casey & Krauss 2018

A total of five protected areas have been affected by Coca Codo Sinclair with an impact on flora and fauna, especially within the Sumaco Biosphere Reserve and the Cayambe-Coca National Park (Teravainen 2019). New roads to reach the site of the project have caused deforestation in the Sumaco Biosphere Reserve (Power Technology). As shown in Figure 12, the transmission lines affect several protected areas, including the Cayambe-Coca National Park, the Antisana Ecological Reserve and the protected forests of La Cascada and the Tigre River (Vallejo et al. 2018). Lastly, in order to pay back the Chinese loans, Ecuador has increased its oil exploration in the Amazon, cutting deeper and deeper into the forest, including Yasuni National Park, leading to even more deforestation (Garzon).

The social impacts resulting from Coca Codo Sinclair include employment challenges, unsafe working conditions in the construction sites, loss of livelihoods, healthcare and sanitation, and economic hardships. Since there are no indigenous territories in the region, a formal process of free, prior and informed consent did not occur. Communities living in the area represent small-scale farmers and fishermen. As part of the socialization process carried out by the dam's representatives, local residents were promised employment and other economic opportunities for small businesses to provide food, lodging, and other services to construction workers arriving in the area. Importantly, the project's representatives did not make any exact commitments to these promises and did not follow through with them. Instead of hiring local residents, the company brought workers from other parts of Ecuador denying employment to those in the area. Many in the local communities also borrowed money to create and increase businesses, for catering and restaurants, for lodging, etc. However, they were excluded from opportunities to sell their services to the project's workers. This caused much social conflict and protests (Ray et al. 2018).

The project promised to hire 4,000 people directly and 50,000 indirectly (Lopez 2009). Sinohydro stated that 70% of those employed to work on the dam would be hired from the local communities; however, they only hired 40% causing grave dissatisfaction. Near the end of construction, unemployment rose in the area of influence. Many people were unable to resume previous activities in the region, such as agriculture, due to the changing landscape (Vallejo et al. 2018).

Local residents also have to pay higher prices for electricity despite their proximity to the dam. The diverted water from the dam has dried out parts of the Coca River for months affecting the fish stocks. As a result, fishermen's livelihoods and recreational activities on the Coca River have been damaged. In addition, flooding caused by the water released from the dam disrupts farming downstream and has even drowned some farmers (Kliman et al. 2019).

There were substantial social impacts for the workers themselves as well. Construction workers filed 26 official labor complaints to the government of Ecuador by 2011. The complaints centered around the unsafe labor conditions. For example, in December 2014 a tunnel platform collapsed killing 13 workers (10 Ecuadorians, 3 Chinese). In addition, the workers received

unsafe drinking water and shower water, which resulted in an outbreak of typhoid fever and bacterial infections among the laborers (Teravainen 2019).

5.1.4 Analysis of CHEXIM's compliance with social and environmental items

In 2004, CHEXIM created minimal environmental guidelines for its investments abroad. Four years later, the bank publicly disclosed more complete guidelines, which require the recipient government to complete an environmental and social impact assessment before approving any loan. The guidelines also mandate that open consultations with affected people be held and touch on managing resettlement issues. However, experts do not know if CHEXIM has also developed the necessary institutional framework to stand by their guidelines (Herbertson 2012). There are numerous issues with how CHEXIM applied social and environmental safeguards for Coca Codo Sinclair. The bank did not respect any of the safeguards required and practiced an extremely deferential approach to safeguards allowing the Ecuadorian government's misdoings to go uncontested.

For loan approval CHEXIM requires an environmental impact assessment, permits, and the approval of local environmental administrations. CHEXIM also claims to respect the rights of local communities to resources. CHEXIM requires public consultations for projects with significant negative impacts. Lastly, the bank requires an ex-post EIA after construction is completed (Vallejo et al. 2018).

Although the original feasibility studies showed that the project was high-risk due to the proximity to an active volcano, Ecuador's officials and CHEXIM chose to ignore them. At the time of the studies, environmentalists also pointed out that construction and operation of the dam would divert too much water, nearly drying out parts of the Coca River for months of the year, wiping out aquatic systems (Kliman et al. 2019). These environmental concerns did not deter Chinese funding. Additionally, CHEXIM did not require a comprehensive environmental impact assessment of the entire project looking at both the dam and the transmission lines. As such, there were two separate EIAs, one for the dam and one for the transmission lines, which does not

provide an accurate picture of the potential impact from the project as a whole. Other financial institutions, such as IDB, would have required a comprehensive EIA.

One of the conditions of the loan in the contract with CHEXIM was that Chinese companies must be made the general contractor. This prevented open bidding and made oversight ineffective. A municipal oversight committee was tasked with the environmental monitoring of the dam from 2009-2011; however, halfway through construction, that monitoring became part of the contractor's responsibilities. This represents a huge conflict of interest since the company performs its own environmental audits. As a result, the public has little access to the environmental reports since the company has not published them although it is required by transparency requirements (Ray et al. 2018). CHEXIM has continued funding despite the lack of compliance with environmental reporting. The bank has provided very little information and has prevented access to public information (Vallejo et al. 2018). There have been issues with transparency throughout the entire life cycle of the project.

The dam's environmental management plan includes labor safeguards, but these were ignored by Sinohydro and CHEXIM. Even the death of thirteen workers did not halt the bank's financing. Two years passed between the accident caused by the company's negligence and the dam coming online. In that time, the workers went on strike to demand safe labor conditions. Workers striked in 2011 and 2012. By the end of 2011, a total of 26 complaints were filed against Sinohydro in just the province of Sucumbios regarding work conditions. As a result of the complaints, the Ministry of Labor and the Social Security Institute of Ecuador (IESS) did inspections and fined Sinohydro $5,280 USD. The company then implemented corrective measures under the Ministry of Labor's supervision. However, a special investigation approved by the Controller's Office in 2013 found almost thirty instances in which Sinohydro failed to meet the required regulations for occupational health and safety (Vallejo et al. 2018). The typhoid outbreak and bacterial infections related to unsafe drinking water supplied at the construction site, combined with the deaths of several workers, resulted in protests that delayed work but had no impact on CHEXIM's disbursements for the project.

Currently, there are many issues with the dam. Thousands of cracks in the dam's machinery can be seen, including the distributors, which were imported from China (Casey & Krauss 2018). In October 2018, CELEC announced that three out of eight generation units were not operating because of major disconnections in the system. The dam can only work at full capacity for five to six months out of the year due to changes in water availability. In addition, there has been a shortage of energy caused by power cuts in the transmission lines that have affected many Ecuadorian cities. As result, two new dams (Minas San Francisco and Delsitanisagua) had to be developed to offset the energy shortage (Teravainen 2019). In essence, the dam is inoperable and provides no economic benefits (Kliman et al. 2019). Coca Codo Sinclair has had six orders of suspension, a termination warning and 92 labor claims representing its multitude of problems. The Minister of Electricity and Renewable Energy ordered two independent studies to assess the damage and Sinohydro's contractual liability in June 2019.

Although an ex-post EIA is required after construction is completed by both CHEXIM and Ecuador, there was never one conducted (Vallejo et al. 2018). This is a convenient fact given the enormous and myriad of issues resulting from the dam. Ecuadorian legislation is strong but difficult to execute, and in the case of the Coca Codo Sinclair dam, Ecuador failed as guarantor of safeguards while CHEXIM willingly participated in the various instances of non-compliance with rules and regulations.

5.2 Belo Monte Dam in Brazil

The Belo Monte Hydroelectric Project is the largest dam in the Amazon Basin, the fourth largest dam in the world and the largest infrastructure project undertaken in Brazil during the first decade of the 21st century. The dam became operational in November 2015 supplying 4.46 of the 11.23 GW originally estimated, a significant decrease due to climate variability and a small reservoir (Moran et al. 2018). This reduced energy output means more dams on the Xingu River are projected to be built to compensate. The total cost of the dam came in at $18.5 billion USD, with eighty percent of the costs financed by the Brazilian Development Bank (BNDES). It was the largest investment in the history of the bank in Brazil (AIDA 2018). The project moved forward despite significant issues with the EIA and requests by technical experts to halt the

licensing process. As a result, the environmental and social impacts caused by the dam are extensive and long-lasting.

5.2.1 Project location

Belo Monte is located in the Xingu Basin of the Brazilian Amazon, an area known for its vast biodiversity and cultural importance. Covering 450,000 square kilometers, the Xingu Basin contains 29 indigenous territories which are home to 20,000 indigenous peoples and 28 ethnic groups. The Xingu River, a tributary of the Amazon River within the basin, flows from the south to the north and is of vital importance for the communities living in the Xingu (Garzon & Millikan 2014). Figure 13 shows the location of the dam and the surrounding indigenous groups.

Figure 13. Map showing the location of Belo Monte Dam and the surrounding indigenous territories.

Source: The Guardian 2014

5.2.2 Project history

Plans to construct a dam in the region began during the military dictatorship in the 1970s. During that time, the government power utility company Eletrobras funded a hydrographic study in the Xingu Basin and proposed the Belo Monte dam as part of a larger group of six dams along the Xingu River. The river's "Big Bend" ("Volta Grande" in Portuguese) was the key feature of the Belo Monte site, which extends 140 kilometers and has a water level that rises and falls nearly 100 meters depending on the season. The viability and environmental studies were carried out by the National Consortium of Consulting Engineers (CNEC), a consulting firm in Sao Paulo. As the studies were being conducted, the large Brazilian construction company Camargo Correa purchased CNEC. In 1985, field studies on environmental impacts commenced under CNEC which contracted universities and research institutions to carry out the work (Fearnside 2017).

Eletrobras publicly released its "2010 Plan" in 1987, which included the six dams on the Xingu River. This generated strong opposition from indigenous groups in the region, including the Kayapo people. The Kayapo indigenous group dominates the middle and lower portions of the Xingu River. In 1989, they led the first major protest against the proposed dams. A large group of indigenous peoples opposed to the dams met in Altamira, Para over the course of five days. Figure 14 is a photo of an indigenous woman from the Kayapo group holding a knife up to the President of Eletronorte in protest of the proposed dam. This event gained attention around the world and resulted in repercussions for the project's financing. Eletrobras had requested funding in the amount of $10-$20 billion USD from the World Bank and Inter-American Development Bank (IDB) to help finance the dam, but both banks decided not to fund the project due to the requests of the indigenous peoples and the serious opposition. With no available funding and Brazil's inability to solely finance the projects, the proposed dams were shelved (Fearnside 2017).

Thirteen years later, during the presidency of Fernando Henrique Cardoso in 2002, Eletronorte (a subsidiary of Eletrobras) submitted a revised proposal for the dam along with two Brazilian construction companies (Camargo Correa and Odebrecht). The new design called for a run-of-the-river design to divert 80% of the Xingu River. However, plans to move forward with the revised proposal did not happen until Luiz Inacio Lula da Silva (known as Lula) became

President of Brazil in 2003. Lula stated his objectives to finish Brazil's stalled infrastructure projects during the early days of his term, including the Belo Monte dam. As a result, the Brazilian Congress approved the legislative decree 788 in 2005, which granted permission to build the dam. This move violated Article 231 of Brazil's 1988 Constitution and the Indigenous and Tribal Peoples Convention of 1989 within the International Labour Organization Convention (ILO 169), which Brazil ratified in 1991, since consultation protocols with the affected indigenous groups were not carried out (Fearnside 2017). The project did not have a completed environmental impact assessment (EIA) when it was approved either. A civil lawsuit on this violation of the rights of indigenous peoples was brought by the Federal Public Prosecutor's Office in 2006 and has yet to be heard in the Supreme Court (Garzon & Millikan 2014).

Figure 14. Photo of Tuira, a Kayapo woman, and the President of Eletronorte, Jose Lopes Muniz, at the Meeting of Indigenous Peoples of the Xingu in Altamira.

Source: Garzon & Millikan 2014

The environmental impact and economic feasibility studies ramped up in 2005 and the findings were released two years later by Eletrobras, Camargo Correa, and Odebrecht. Given the proposal to divert a majority of the river and the ensuing drought, many groups who depended on the river

for their survival, including indigenous peoples, riverine communities, fishermen and other local populations, were concerned with the proposed dam and the social and environmental risks it represented. For example, water quality and transport as well as the number of fish would all be impacted causing the region to become uninhabitable and forcing the indigenous groups to move. The Kayapo and other indigenous groups voiced their concerns regarding the project, including the fact that they were not consulted, during the Second Meeting of Indigenous Groups in the Xingu in June 2008. One month later, the National Council on Energy Policy (CNPE) approved Resolution 6, which confirmed that Belo Monte would be the only large hydroelectric dam to be built on the Xingu River (Garzon & Millikan 2014).

As part of the necessary legal processes the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA), which was created in 1989 and took over responsibility for licensing processes and vetting the EIA, organized public hearings with the indigenous groups in September 2009 to discuss the environmental impact assessment done on Belo Monte (Fearnside 2017). However, there were multiple problems with how these hearings were carried out. The EIA, more than 20,000 pages, was only shown to the affected communities two days before the public hearings between the state and the local communities. It was presented in Portuguese and there was no translation for people whose native language was not Portuguese. Overall, there were not sufficient public hearings and they were not done in the right locations where the majority of the most threatened populations could participate (Garzon & Millikan 2014). In addition, many police and military were present during the public hearings intimidating the indigenous peoples. The indigenous participants left early to demonstrate that they had not been consulted (Fearnside 2017).

That same month, the Brazilian Development Bank (BNDES) announced its plans to finance the project despite the fact that the preliminary license had not been granted. At the same time, an independent panel of specialists delivered a technical report to IBAMA. The report “Critical Analysis of the Environmental Impact Study of Belo Monte” identified grave problems and serious gaps in the EIA. Nevertheless, the Brazilian government pressured IBAMA to approve the preliminary license. In November 2009, a team of environmental analysts at IBAMA produced a technical report arguing against the approval of a preliminary license, stating they did

not have enough time to analyze what came out of the public hearings in September as well as issues related to the indigenous groups due to pressure from the government (Garzon & Millikan 2014).

Despite the concerning statements in the technical report, the President of IBAMA issued the preliminary license number 342/2010 for Belo Monte on February 1, 2010. The director of IBAMA's licensing sector was replaced before the preliminary license was granted. Two days before, the technical team at IBAMA issued technical note 04/2010 stating, "there are not enough elements to certify the project's environmental viability." The preliminary license resulted in a Basic Environmental Plan and included 40 preconditions that needed to be met before an installation license could be granted. These included the construction of schools and health posts and monitoring the quality of water and fish, among other items. As such, IBAMA adopted a practice of inserting preconditions into the license representative of gaps in the EIA. The first condition required the project developer to establish a robust monitoring plan on the impacts to water quality, alluvial vegetation, ichthyofauna, turtles, fishing, navigation, and ways of life of the population in the affected area within the first six years of the dam's operation (Garzon & Millikan 2014).

On April 20, 2010 Brazil's National Agency for Electrical Energy (ANEEL) held the auction for the Belo Monte dam despite the various civil lawsuits filed by the Federal Public Prosecutor's Office and civil society organizations. The lawsuits centered on the irregularities with the concession of the preliminary license and the fact that Eletrobras had not complied with the mandatory preconditions of the license, including the protection of indigenous peoples and their territories. Only two consortiums participated in the auction. Norte Energia, S.A. won the bid in partnership with various Brazilian construction companies. Shortly after the auction, the construction companies left the consortium due to fear associated with the financial risks of the project and the desire to preserve their financial assets. In their place entered the state-owned companies of Eletrobras, pension funds and other state-controlled investment funds (Garzon & Millikan 2014). The construction companies still bid for portions of the construction works since they were guaranteed payment regardless of how much energy the dam generated. The Chief Executive Officer of one of the construction companies, Camargo Correa, confessed to paying

$30 million reais to two Brazilian political parties to obtain construction contracts. Other companies, including Odebrecht and Andrade Gutierrez, later revealed the bribes they made for Belo Monte contracts as well (Fearnside 2017).

In March 2010, various social movements in Altamira handed an extrajudicial notice to BNDES warning the bank about the issues with the preliminary license. Citing the Brazilian Constitution and the National Environmental Policy Law (Law 6,938/81), the document stated that the bank would be liable for the costs of the social and environmental impacts of the project if it financed Belo Monte. The Chief of Staff to the President of BNDES responded to the notice on April 22, 2010 saying that the bank did not know the specifics of the project (Garzon & Millikan 2014).

In September 2010, Norte Energia presented a letter to BNDES requesting long-term financing for Belo Monte. Three months later, the President of BNDES Luciano Coutinho, announced that the bank would finance the project. In January 2011, the report "Mega-project, Mega-risks: analysis of risks for investors in the Belo Monte Hydroelectric Complex" was released by two non-governmental organizations (Amigos da Terra - Amazonia Brasileira and International Rivers) and delivered directly to BNDES in an attempt to discuss the content. However, the organizations never received a response (Garzon & Millikan 2014).

BNDES announced the approval of its first loan to Norte Energia for $1.087 billion reais to advance actions for the implementation of Belo Monte, even though the consortium did not have an installation license for the project. In response, the Public Prosecutor's Office in Para State requested information from the bank regarding the analysis and approval criteria it used for its financing. They also asked what the first loan would be used for and what the bank thought about the legality of a partial installation license. The bank responded saying they did not believe it was necessary to have a technical analysis phase on the economic viability of the project, both in terms of the cost of the project as well as the cost to mitigate social and environmental impacts and provide compensation. They stated that the first loan would be used to pay the suppliers for equipment and materials as well as service providers for the project and for implementation studies. The conditions on the loan included the creation of a non-intervention obligation at the site of the dam until the installation license was issued. BNDES stated that in the event that the

social and environmental conditions were not upheld, the long-term financing contract would be able to suspend disbursements until the situation improved (Garzon & Millikan 2014).

On January 12, 2011 the President of IBAMA resigned so that he did not have to sign the installation license. The Interim-President of IBAMA signed the partial installation license (LI 770) on January 26, 2011 facing pressure from the government's electricity sector. The following day, the Public Prosecutor's Office in Para State filed a civil action lawsuit against the irregular concession of the partial installation license; partial licenses do not exist under Brazilian law. In response, Federal Judge Ronaldo Desterro suspended the partial installation license in March 2011. However, several days later, the President of TRF-1, Judge Olindo Menezes, signed a Security Suspension (an instrument allowing judicial decisions to be reversed if they could bring harm to public order, health, security, and the economy) at the request of Brazil's Attorney General. This move invalidated the injunction and allowed work on the Belo Monte project to continue based on the partial installation license (Fearnside 2017). In April 2011, the Inter-American Commission on Human Rights of the Organization of American States requested that the Brazilian state halt all activities until indigenous peoples were properly consulted.

On June 1, 2011 the President of IBAMA signed the installation license number 795/2011 allowing the work on the dam to begin even though only 5 of the 40 preconditions had been met. Five days later the Public Prosecutor's Office from Para State filed a new civil lawsuit requesting three items: 1) the installation license be annulled, 2) Norte Energia comply with all of the preconditions of the preliminary license before requiring a new installation license and 3) IBAMA refrain from issuing a new installation license until Norte Energia complied with the preconditions of the preliminary license (Garzon & Millikan 2014).

Despite all of this, BNDES signed the contract for the first bridge loan to Norte Energia for $1.1 billion reais on June 16, 2011. Construction of the dam began a week later. BNDES received its second extrajudicial notice regarding its financing in October 2011 signed by more than 170 civil society organizations. The notice included information on the serious issues with the project's licensing, the violation of the rights of indigenous peoples, the various civil lawsuits brought by

the Public Prosecutor's Office, and the project's deviation from the legal framework of financing institutions as well as the environmental and social responsibility guidelines of the bank. BNDES provided a generic response on November 16, 2011 (Garzon & Millikan 2014).

At the time, seven surveys carried out by IBAMA technicians confirmed that Norte Energia had not complied with the conditions of the environmental license and even reported false information. In January 2012, the IBAMA staff recommended sanctions on Norte Energia and a month later IBAMA applied a $7 million reais fine on the company for not complying with the environmental license conditions (Garzon & Millikan 2014).

Despite these events, the Director of BDNES approved the second bridge loan to Norte Energia in the amount of $1.8 billion reais in February 2012. However, this second loan was not publicly divulged by BNDES when it was approved and was only discovered in May 2012 through a formal request for information that International Rivers issued using the new access to information law 12.527/2011 (Garzon & Millikan 2014).

In November 2012, BNDES announced its approval of a $22.5 billion reais loan package for long-term financing of the Belo Monte dam. The package broke down as such: 1) a loan directly to Norte Energia in the amount of $9.8 billion reais, 2) an indirect loan in the amount of $9 billion reais using two pass-through agents (Caixa Economica Federal for $7 billion reais and BTG Pactual for $2 billion reais), and 3) another loan directly to Norte Energia in the amount of $3.7 billion reais to buy equipment. This represented the largest loan in the bank's history (it still is) and covered about 80% of the project's total costs estimated at $28.9 billion reais. BNDES charged 4% annual interest on a 30-year loan. Some of the terms in the loan were not provided by other financial institutions, including payment in installments for 30 years. BNDES also gave an unusual series of loan extensions and allowed other modifications to the terms after the first development loan was granted to the dam consortium (Garzon & Millikan 2014).

On December 4, 2012 an open letter signed by the Coordinator of the Xingu Vivo Movement and nearly 70 organizations was delivered to BNDES headquarters calling out the extensive list of irregularities and economic, legal, and social-environmental problems of Belo Monte. The

letter requested that the President of BNDES not grant the financial package announced the prior week. However, two weeks later the President of BNDES signed the package for long-term financing of the project (Garzon & Millikan 2014).

On September 10, 2015 IBAMA's technical staff issued a formal opinion listing a series of conditions that were still pending before an operating license could be issued. Nevertheless, the operating license was granted in November 2015 allowing the reservoirs to be filled despite the fact that the precautionary measures to protect indigenous peoples in the region filed by the Inter-American Commission for Human Rights in 2011 had not been met. The reservoir was filled in December 2015 and shortly after the Inter-American Commission for Human Rights Opened a case against Brazil for human rights violations (Fearnside 2017). The violations include the absence of consultation and FPIC of affected indigenous groups, the lack of participation and adequate assessment of environmental impact and the forced displacement of thousands of people (AIDA 2018). Figure 15 provides a timeline of major events related to the Belo Monte Dam.

Corruption played a large role in the development of the Belo Monte Dam. "Operation Car Wash," an investigation launched in 2014 by the Federal Police of Brazil, revealed the largest graft scheme in the history of Lain America. For years company executives at the Brazilian oil company Petrobras took bribes made by Brazilian construction companies and awarded contracts at inflated prices in return. Secret funds were created to store and channel the illegal payments to politicians from numerous political parties who had appointed the Petrobras executives. In many cases the funds financed political campaigns and aimed to keep political groups in power. Billions of dollars have been paid illegally and politicians and executives at the highest levels have been charged in the scheme, including the former president of Brazil, Luiz Inácio Lula da Silva (Watts 2017). As the investigation has gone on, it has come to light that this type of scheme occurred in other sectors as well, including the electricity sector. Brazil's Central Accounting Office initiated an audit focusing specifically on Belo Monte and found that the price of the dam was inflated by $3.384 billion reais (TCU 2016). The investigation found that throughout the development of the Belo Monte Dam, politicians received payments from the construction

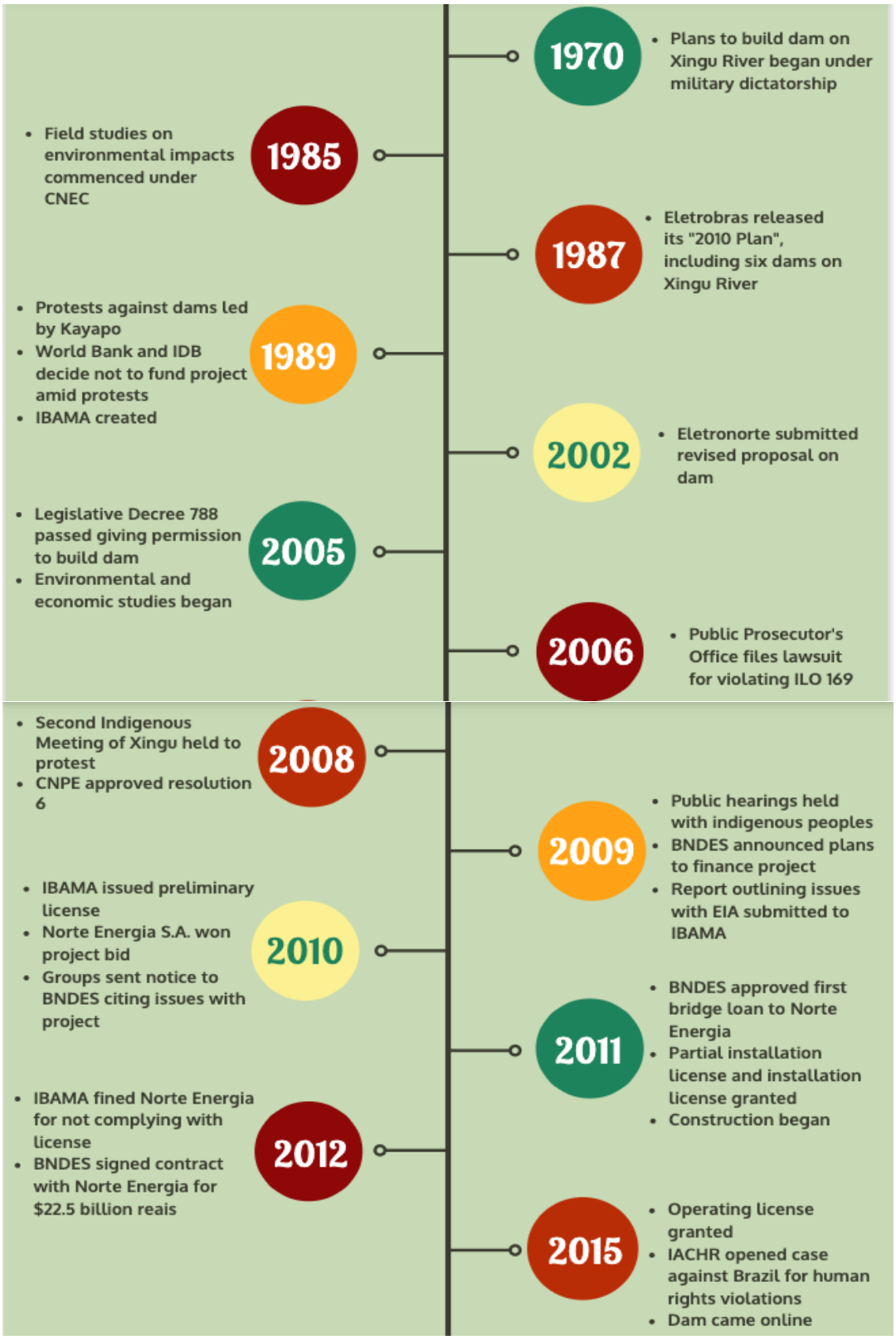

Figure 15. Timeline of major events related to the Belo Monte Dam.

Source: Author

companies to approve the project despite the strong evidence against building it (Moran et al. 2018).

5.2.3 Analysis of BNDES compliance with social and environmental items

BNDES' involvement with Belo Monte started at an advanced phase of the planning and licensing of the project. The bank approved its first loan after the technical studies had already been conducted by the electric sector of the government and its partners in the private sector and after the preliminary license had been granted by IBAMA. Given its late entry to the project, BNDES' ability to influence the design of the dam was minimal (Garzon & Millikan 2014).

However, there are numerous issues with how BNDES applied social and environmental safeguards for Belo Monte. The bank relies solely on a final and unappealable judicial decision to guide its operations, providing opportunities for the misuse of the Security Suspension and the violation of human rights and environmental legislation. BNDES does not have an operational policy regarding free, prior, and informed consultation with indigenous peoples and other traditional populations affected by enterprises. The bank's safeguard approach is to follow the national legislation of the borrowing country. Since Brazil ratified ILO 169, by not carrying out consultations with indigenous peoples, the bank did not abide by the country's law on this matter (Garzon & Millikan 2014).

BNDES did not carry out risk and feasibility analyses for the first two bridge loans, which conflicts with current banking rules. The bank also ignored its own internal regulations in releasing the funds without an evaluation of economic viability and social and environmental risks (Fearnside 2017). Belo Monte would not have been constructed if they had conducted a rigorous cost-benefit analysis or followed recommendations from the World Commission on Dams. In fact, the economic analysis done demonstrated a high likelihood, 72% chance, that the costs of the dam would be greater than the benefit (Moran et al. 2018). Social and environmental costs resulting from damages were also not factored into the project when BNDES analyzed the financing. Due to the protests, costs to participating firms and banks totaled US$1.4-5 million per day of delay.

The only parameter used by BNDES within the contract to analyze the environmental regularity of the project and thereby approve funding and continue disbursements was the existence of the installation license. The bank did not concern itself with the degree of compliance with the conditions of the installation license or the preliminary license as demonstrated by the long-term financing contract. As long as the installation license was not suspended, the bank was satisfied regardless of Norte Energia's performance on social-environmental items. This means that only the cancellation of the license could have affected the disbursements of the loan according to the contract. The anticipatory conditions were not realized because the loan contracts required that the installation license be obtained in order to release the funds (Garzon & Millikan 2014).

BNDES relies on technical reports done by Norte Energia and IBAMA to monitor the project's execution, including its compliance with the conditions of the environmental license. However, IBAMA did not have the capacity to responsibly monitor the project. As such, a clause was included in the contract with Norte Energia obligating them to hire an independent auditing group to monitor the social-environmental regularities of the project (AIDA 2018). Under Annex II of the main contract, it states that Norte Energia has to send BNDES quarterly (later reduced to every six months) and annual reports on the social and environmental requirements of the project and quantitative indicators of the human development in the municipalities affected by the project. Compliance with the social and environmental conditions needs to be proven via the reports sent each quarter by Norte Energia for the disbursements and use of the funds under the contract. Although the contract required an independent auditing group, the verification of compliance with the social and environmental obligations within the contract was self-reported by Norte Energia (Clause 13. III, h). The results of the audit have no contractual value and the contract does not allow for any legal action in response to reports produced by the audit. Clause 20 of the main contract says that only the administrative or legal cancellation of the license can comprise the use of disbursed funds. Norte Energia only has to present reports, but the content does not matter (Garzon & Millikan 2014).

In addition, the contract does not mandate that the social and environmental audit reports be disclosed publicly. In fact, BNDES claimed bank secrecy in order to withhold information on whether the auditing group had been contracted or not. The non-governmental organization

Instituto Socioambiental has been requesting the auditing reports from BNDES since July 2013 using the access to information law, but the bank denied the request invoking bank secrecy (Villas-Boas et al. 2015). After three years of pressuring the bank, an extrajudicial agreement was reached between BDNES, the Public Prosecutor's Office, and Norte Energia requiring the latter to publish the reports produced by the auditing group on its website.

The bank took a few measures to mitigate the environmental and social impacts of Belo Monte. BNDES announced that it would invest $3.2 billion reais for environmental and social actions, including the Basic Environmental Plan and to ensure compliance with other conditions of the environmental licenses. The bank also said the project would put $500 million reais into the Sustainable Regional Development Program for the Xingu with the goal of improving the regional population's quality of life (Garzon & Millikan 2014).

5.2.4 Social and environmental impacts of the project

The Belo Monte dam caused significant and irreversible damages to the surrounding environment through deforestation, biodiversity loss, and land cover change. Social impacts, including displacement, higher crime and homicide rates, health concerns, and livelihood disruptions have touched upon thousands of people in the region. Figure 16 presents a consolidated view of all the impacts caused by the dam. The serious environmental and social irregularities in the project resulted in more than 60 lawsuits and at least 29 fines from IBAMA (AIDA 2018). Importantly, many of the ill effects are yet to be fully documented given the short amount of time between the dam coming online and now.

The dam's reservoir flooded more than 500 square kilometers of tropical forest and lowlands (Fearnside 2017). Over 40,000 people, including many indigenous groups, were displaced as a result. A total of 9,000 families were forcefully relocated (AIDA 2018). Close to 5,000 riverine communities and many indigenous peoples were forced to migrate to Altamira. Now these communities live far away from the Xingu River, which they depend on for their livelihoods, and have few alternative employment opportunities. With no public transportation from their new housing they have lost access to their fishing livelihood (Villas-Boas et al. 2015).

Figure 16. The social and environmental impacts caused by the Belo Monte Dam in Brazil.

Source: Author

The surge in Altamira's population is not only due to the displaced communities, but also the more than 100,000 construction and service workers who moved there to find employment. Since construction work on the dam started in 2011, the population of Altamira increased from 100,000 to 150,000 (Villas-Boas et al. 2015). This population growth is associated with higher crime and violence rates. In Altamira, the murder rate increased by 147% during the construction of the dam making it the deadliest city on the planet in 2015 (Prestera 2019).

Local communities have also suffered from health issues. Given the disruption of their habitats, many indigenous peoples abandoned hunting and fishing. They turned to the consumption of processed food made available by the influx of people in Altamira. This dramatic shift in their diet has caused health problems. For example, malnutrition rates increased in children under the age of five across the indigenous territories. Child mortality for indigenous peoples in Altamira was four times higher than the national average of Brazil (Villas-Boas et al. 2015).

Politicians promised to lift people out of poverty and provide important public services with the construction of Belo Monte. However, the local communities have borne the brunt of this ill-conceived project. Many have been displaced, lost access to their livelihoods, witnessed

increasing violence, buried loved ones, and have received no compensation in return. Their hardships have only increased. In fact, electricity bills for local communities went up instead of down, despite the fact that they live right next to the dam (Moran et al. 2018).

The construction of the Belo Monte Dam is linked to increasing deforestation such that in 2011, deforestation in Brazil was highest around the dam's surrounding area (Atkins 2018). Illegal logging exploded in protected areas and indigenous territories around the dam. Forests around Altamira were cut at a faster rate than anywhere else in the country as thousands of people moved in and forest degradation rates went up around the project site. Neighboring indigenous territories experienced increased deforestation due to the land value increase in the area. From 2008-2013 deforestation inside indigenous territories located in the affected area of the dam was 193.4 square kilometers, an increase of 16.31%. In 2013, the Cachoeira Seca Indigenous Territory had the highest deforestation of any indigenous territory in Brazil. The following year in 2014, 200,000 cubic meters of wood were extracted in the same indigenous territory - the equivalent of filling 13,000 logging trucks (Villas-Boas et al. 2015). Deforestation catalyzed by the dam spread extensively. Greenpeace linked illegal deforestation in indigenous reserves more than 200 kilometers away to the dam.

Much of the illegally logged wood was sold to the construction workers on the dam site, which consumed a lot of wood as shown in Figure 17. Norte Energia bought large quantities of wood from external suppliers, which the environmental programs sought to avoid since most of the commercialized wood in the region is illegal. A good portion of the wood used for the construction rotted and was not reused as required by the Basic Environmental Plan (Villas-Boas et al. 2015).

Burnings increased in indigenous territories and illegal roads were opened facilitating invasions. There was an increase in the illegal invasions by hunters and commercial fishers in three indigenous territories. Illegal mining in indigenous territories also increased. The forest degradation caused by the illegal logging and mining reduces biodiversity and creates a greater risk of fire. There is also great violence and intimidation used against the inhabitants by the illegal loggers. Even with the dire need for resources to protect these areas, close to 80% of the

environmental compensation funds from Belo Monte went to protected areas outside of the Xingu Basin (Villas-Boas et al. 2015).

Figure 17. Photo depicting deforested wood for the construction of the Belo Monte Dam.

Source: Villas-Boas et al. 2015

Belo Monte has had an enormous impact on fish populations by destroying breeding sites and preventing migration. The project reduced 80% of the flow of the Xingu River to fill up the reservoir and in this process, many fish were trapped and suffocated. Due to inability to migrate, many fish have not been able to complete their reproductive cycles. The construction of the dam, explosions, excessive lighting, reduced water transparency and dredging drove away and killed many fish. A total of 63 species of fish have been threatened, including the pacu, a staple of indigenous peoples in the region. The damage to the fish is so severe that in April of 2016 IBAMA fined Norte Energia $11 million for the death of over 16 tons of fish which could not get past the dam during migration (Moran et al. 2018).

This loss of fish has made traditional fishing areas inviable. The surrounding indigenous populations have been impacted since they depend on the fish for their sustenance. Three indigenous groups in particular were left without the fish and turtle stocks they depend on (Fearnside 2017). Some of the most important species of fish for the indigenous peoples have

completely disappeared. Given the decreasing fish stocks, food insecurity has increased amongst these groups. In addition, traditional fishermen were forced to look for new fishing spots in indigenous territories and protected areas due to declining fish stocks from the dam. These areas were already being used by other people resulting in social conflict over user rights. The monitoring done by Norte Energia on fish stocks is based on fish weight and not on the loss of traditional fishing areas. The fishermen have tried to demonstrate the impact from these changes, but IBAMA has not responded to their concerns in more than two years (Villas-Boas et al. 2015).

Other taxonomic groups have been affected as well, including turtles. Turtles in the region face two new threats: poaching and inability to breed. The dwindling fish populations have resulted in an uptick of turtle poaching by local communities. This increased pressure is negatively affecting the turtles' ability to maintain population numbers. The ability of the turtles to migrate for breeding has also been impacted by the dam. For example, the survival of the Arrau river turtle has been threatened since many of its breeding sites are close to the dam and the species need to migrate upstream to spawn but are no longer able to do so. As part of the EIA, Norte Energia committed to managing the breeding sites of the turtles but did not do so (Brenna 2016).

There was significant change in the land cover as a result of the dam as depicted in Table 2. The total amount of primary forest in the region declined a total of 12.5% from 2006-2017. Secondary forest remained stable except for the period between 2008-2011 when it decreased by 2% in the area. Belo Monte caused increased water along the canal in 2016-2017 and decreased water downstream. This decreased water downstream resulted in an increase of natural bare land along the river. Natural bare land had a small proportion in 2006 and increased in 2008 and continuously increased from 2015-2017. The agro pasture area increased before dam construction from 2006-2011 and then remained stable. The area of man-made bare land increased in 2015 due to construction of the canal, most of which was replaced with water in 2016 due to completion and operation of the dam (Jiang et al. 2018).

Table 2. Percentages of each type of land cover at the project site during specific years throughout the project cycle of the Belo Monte Dam.

	2006	2008	2011	2015	2016	2017
Primary forest	47.81%	44.21%	41.70%	38.28%	36.34%	35.31%
Secondary forest	16.01%	16.08%	13.99%	13.92%	14.09%	13.91%
Agropasture	23.67%	27.25%	31.30%	31.23%	30.33%	30.39%
Man-made bare land	0.51%	0.52%	0.62%	3.49%	2.25%	2.52%
Natural bare land	0.85%	2.70%	2.31%	4.03%	5.03%	5.53%
Water	11.15%	9.22%	10.08%	9.04%	11.96%	12.33%
Source: Jiang et al. 2018						

6. Discussion and Conclusions

This research aimed to answer the overall question of: how has the evolution of safeguards of financial institutions affected the environmental and social impacts of hydroelectric dams in the Amazon? The World Bank was the first financial institution to develop and implement its own safeguards. This took place at the end of the 1980s as a result of pressure put on the bank by international actors, including civil society organizations and project-affected individuals. The original safeguards of the World Bank followed a traditional approach – used by multilateral development banks – in that borrowing countries had to comply with the regulations of the bank following a step-by-step process in order to receive funding. In a case of non-compliance with the safeguards, funding could be withheld, thus creating an accountability mechanism. Other multilateral development banks, including IDB, modelled their safeguards off of those of the World Bank as the bank took on a global role – leader of normative frameworks within the development finance sector. Over time, the safeguards of the World Bank have come to be considered as the gold standard, cementing its position as the frontrunner in this space.

Given the level of safeguards, it is reasonable to hypothesize that hydroelectric dams in the Amazon have seen improved results regarding their environmental and social footprint. Although

the multilateral institutions adopted rigorous safeguards over the years, this research found that this evolution did not result in less environmentally and socially harmful hydroelectric dams in the Amazon. In fact, there have been a multitude of projects, including Coca Codo Sinclair and Belo Monte, recently completed in the Amazon with devastating impacts on both the environment and communities. This is due to new actors within development finance that emerged in the mid-2000s, which utilize a different approach to safeguards stemming from dissatisfactions with their previous role as debtors to the multilateral institutions.

Many borrowing countries had long complained that the safeguards of the World Bank were burdensome and costly. Although the global finance scene had traditionally been dominated by the World Bank, new players came onto the scene in the 2000s due to a changing global order. With booming economies, new emerging powers led by Brazil, Russia, India, China, and South Africa, who had historically received financing from the World Bank, were able to create their own national development banks to provide credit domestically and internationally. These countries intentionally chose to utilize a different approach to safeguards given their criticism of the traditional approach they deemed to be imperialistic. The new national development banks employ a country systems approach to safeguards, which entails deference to borrowing country legislation and therefore they do not have their own safeguards. This represents a significant shift from requiring specific and substantial items to absolutely no requirements for project approval and fund disbursement.

At the same time, the stringency of safeguards at multilateral financial institutions, such as the World Bank and IDB, prevented these entities from taking on environmentally and socially risky projects leading to a funding gap. The combination of the funding gap and the emergence of new finance actors with no safeguards of their own created a situation in which incredibly harmful projects with large risks could go forward thus creating a race to the bottom in large-scale infrastructure financing. In particular, national development banks from China and Brazil have become the dominant players in development finance in the Amazon due to their ample resources and safeguard approach of deference to host country regulations; whereas, the World Bank has largely stepped away from large-scale projects in the region due to the high risks associated with them.

This is evidenced by the case studies of Coca Codo Sinclair and Belo Monte. For both projects, multilateral development banks, including IDB and the World Bank, expressed initial interest but later refused to finance them once feasibility studies were conducted and the environmental and social risks of the projects became obvious. Although the safeguards of the multilateral banks worked to prevent the dams from going forward at the time, once the national development banks came about, both Ecuador and Brazil were able to secure funding for the projects from these new players, CHEXIM and BNDES. Given the total deference approach to safeguard employed by these financial institutions, they willingly took on financing for the hydroelectric dams despite the substantial environmental and social risks they presented. As stated in the section with the case studies, both projects resulted in massive harm to the environment, including deforestation, loss of biodiversity, and disruption of river ecology as well as social ailments, such as displacement, loss of livelihoods, and health issues. Drawing from the history of safeguards as well as the evidence in the case studies, this research concludes that environmental and socially harmful hydroelectric dams in the Amazon continue to come about despite the evolution of safeguards over the last several decades.

6.1 Traditional Approach Bests Country Systems Approach

This research aimed to discover if certain types of safeguard approaches are more effective than others at mitigating environmental and social impacts and found that the traditional approach to safeguards is more effective than the country systems approach. The traditional approach has an extra layer of safeguards mandated from the financial institution itself versus relying just on the legislation of the host country. The case studies provide evidence for this. Both the World Bank and IDB, which practice the traditional approach, decided not to finance Belo Monte and Coca Codo Sinclair due to environmental and social risks inherent in the projects. By having their own internal regulations to abide by these multilateral banks were able to rescind their offers to fund the dams once issues and risks came to light. In contrast, the national development banks, CHEXIM and BNDES, which follow the country systems approach, agreed to finance the projects. By strictly deferring to the rules of the borrowing country and not having any of their own, these banks supplied financial resources for dams that resulted in devastating environmental and social impacts.

Even for countries with robust and protective measures related to the environment and people, the country systems approach is not sufficient in protecting these groups from project impacts. Although Ecuador and Brazil have strong laws regarding the environment and communities, especially indigenous peoples, deference to them did not affect the negative outcome of the dams. In the case of Belo Monte, when the Brazilian government granted the environmental license despite severe concerns with the EIA, BNDES approved its financing for the project. By abiding to the country systems approach, all the criticisms with the design of Belo Monte were ignored by BNDES which allowed the project to go forward despite its enormous potential for devastating impact. Ecuador even gives rights to nature in its constitution and yet Coca Codo Sinclair was pushed forward by the government. CHEXIM gave funding to the project because it deferred to the Ecuadorian government. But as shown in both cases, even countries with protective environmental and social legislation can turn a blind eye to their own rules and when this happens there is no extra safeguarding layer within the banks which follow the country systems approach.

6.2 Safeguards Futile Without Implementation

This research aimed to evaluate the relative importance of two different items at mitigating impact: the substance of the safeguard itself or the implementing partner of the safeguard. Safeguards can provide critical measures to prevent environmental and social harms related to development projects, but without proper implementation they are useless. The Coca Codo Sinclair and Belo Monte case studies demonstrate this conclusion. Although CHEXIM and BNDES do not have their own safeguards, they both require compliance with host country legislation to approve financing and maintain disbursements. However, there were various occasions in which the own rules of these countries were not followed. For example, Ecuador requires transparency of their projects, but this was not applied throughout the entire process. An EIA and environmental license is also required under Ecuadorian law before construction can begin, but neither of these had taken place when construction on the road to access the dam's power starvation started. In the case of Belo Monte, the Brazilian government allowed for construction to begin with a partial installation license, something that does not exist within Brazilian law. They also granted a license even though the conditions of the EIA had not been

met. BNDES deferred to the rules of Brazil and did not monitor the compliance of Norte Energia in regard to the environmental and social standards. In fact, the bank repeatedly ignored the concerns voiced by civil society organizations and the Public Prosecutor's Office. BNDES stated that its only contingency for continuing disbursements was the existence of the environmental license and chose to ignore all of the violations surrounding the project. The World Bank and IDB pulled out from funding the dam twenty years earlier due to the concerns with indigenous peoples, but BNDES was willing to take the risks.

6.3 National Development Banks Take Over

The research analyzed the changing role of national development banks and multilateral development banks in the Amazon and what this change has resulted in. From the policy analysis (chapter four) and the case studies (chapter five), the research concludes that national development banks have replaced multilateral development banks in the Amazon with grave results for the environment and local communities, due to minimal safeguards and significant corruption in the borrowing governments as well as national banks. The World Bank and IDB dominated the international development field in the twentieth century, financing large-scale projects globally, including many dams. And yet the largest dams ever to be built in the Amazon, Coca Codo and Belo Monte, were not financed by these two multilaterals. Belo Monte was designed to be the third largest dam in the world and Coca Codo the largest dam in Ecuador. Projects of this magnitude would have been prime recipients of multilateral financing in the 1970s. But with the changing times, the funding gap left by the multilaterals as a result of their stringent safeguards has been filled by Chinese and Brazilian national development banks, especially CHEXIM and BNDES. These two banks provided the financing for the Coca Codo Sinclair and Belo Monte hydroelectric dams, signaling the end of an era and the beginning of a new one with stark environmental and social consequences.

Under the banner of South-South Cooperation, Brazil and China have been critical development finance partners for Amazonian countries over the last decade. The infrastructure boom taking place in the Amazon currently is a result of financing provided by these new partners. For example, six of Ecuador's eight large hydroelectric dams have received financing from Chinese institutions (Vallejo et al. 2018). CHEXIM in particular has become one of the biggest funders of

large-scale dams and is the world's largest export credit agency. Similarly, Sinohydro is the largest hydropower company in the world (International Rivers 2012). Financial numbers provide further evidence of this shift from multilateral funding to national development funding. BNDES' lending in Latin America was more than the lending from the World Bank and IDB combined; whereas, CHEXIM and the China Development Bank have become the largest lenders in Latin America since 2007 (Gallagher & Yuan 2017). BNDES committed to using over half of its investments for infrastructure, especially hydroelectric energy, for three years from 2011-2014 (Little 2013).

Brazil and China's national development banks have given loans for projects that were previously rejected due to non-compliance with social and environmental standards by other financial institutions. Both countries continue to pursue projects with substantial and devastating impacts for the environment and local communities. For example, BNDES approved financing for another dam in the Brazilian Amazon, Sao Luiz de Tapajos, which has faced significant criticism over the impact it will cause in the region. As a result of this funding shift, more and more infrastructure projects in the Amazon are continuing to go forward with financial support from Chinese and Brazilian development banks even though the EIAs have demonstrated them to be harmful for the environment and surrounding communities. In such a unique and biodiverse part of the world, this can only signify large-scale and long-term impact on the ground for both the flora and fauna as well as the local inhabitants.

7. Recommendations

This research leads to two recommendations related to the development of hydroelectric dams in the Amazon and financial institutions. As stated in Section 2.1, the Amazon has the greatest biodiversity on the planet, one-fifth of the world's freshwater, an enormous carbon-absorbing capacity, the majority of the world's last uncontacted indigenous groups, and plays a vital role in the region's climate system. Many of the communities living in the region depend on the health of the environment for their livelihoods and subsistence. The Coca Codo Sinclair and Belo Monte case studies showed the disastrous impacts the dams inflicted on the surrounding areas and local inhabitants. Both projects failed to deliver the promises made by politicians that the dams would drastically increase the energy production to benefit the populations and stimulate

the economy to benefit the countries' development. Instead, Coca Codo Sinclair and Belo Monte operate at only half their estimated capacity and have resulted in far greater costs, economically, environmentally, and socially. Due to the inflated pricing of both projects and the lawsuits and fines stemming from the environmental and social destructions they caused, the dams had a much higher price tag in the end. Importantly, both case studies showed that corruption is the main driver of such ill-conceived and damaging hydroelectric projects in the Amazon. Bribes were made to politicians at the highest levels to influence decision-making and move the projects forward. Instead of working to fulfill the energy needs of the countries and provide services and economic benefits to the communities, the real intent was to generate money for construction companies and politicians.

In sum, the evidence from this research indicates that large-scale hydroelectric dams are highly destructive in the Amazon and driven mainly by corruption. Given the environmental and social disasters from Belo Monte and Coca Codo Sinclair and their inability to achieve their stated purposes, these case studies along with other examples, including the Balbina Dam and Tucurui Dam, show that: **The governments of the Amazonian countries should not develop any more large-scale hydroelectric dams in the region**. Instead, governments should invest their financial and technical resources in two areas: improving the production efficiency of existing dams to maximize their energy output and increasing production of solar and wind power to meet energy needs of the populations. Additional research beyond these case studies can provide more evidence to support this recommendation as well as information regarding the other forms of renewable energy.

This research also showed that the multilateral development banks, including the World Bank, have already stopped financing such damaging projects due to their safeguards. The policy analysis in section 4.1 highlighted the importance of the World Bank's safeguards in serving to reject environmentally and socially risky projects. While this is positive for the development finance field, the national development banks have ramped up investments to fill the void left by the multilateral development banks. Section 4.3 of the policy analysis demonstrated that the national development banks have the weakest safeguards of all financial institutions and the

Coca Codo Sinclair and Belo Monte case studies exemplified the dire consequences resulting from the lack of safeguards.

The evidence in this research shows that large-scale dams in the Amazon result in disastrous environmental and social harms when safeguards are not implemented. **The Chinese and Brazilian national development banks need to strengthen their current safeguards and move beyond relying solely on the borrowing countries' laws by implementing their own rules to mitigate damage**. To begin with, they should conduct an independent due diligence process to assess the environmental and social risks of the project before agreeing to provide a loan. In addition, the banks should create direct and transparent lines of communication with project-affected people and the civil society organizations that represent both local communities and the environment in order to hear their concerns and be able to address them. In order to conduct the due diligence and maintain open and transparent dialogue with civil society, the banks need to hire more staff that can focus solely on the environmental and social aspects of the projects. With the guidance of these staff members, the bank can put safeguards in place to mitigate the impacts associated with the project and avoid costly delays and fines. This approach will improve the selection of projects and their sites, increase accountability with the banks and result in better outcomes for all those involved.

The national development banks can develop a hybrid approach to this model, similar to the World Bank's safeguards reform in 2016, in order to maintain ties to their preferred approach of country systems while reducing the environmental and social impacts of their project investments. With borrowing countries that have their own strong legislation regarding the environment and local communities, the national development banks can defer to their rules and act solely as a watch dog to ensure compliance. Conversely, the national development banks can apply their own safeguards for borrowing countries with weak legislation, while also providing assistance for the countries to strengthen their rules so that over time these countries can have greater autonomy. In this case, the banks should also act a watchdog and in both cases, loans should not be approved, and disbursements should not be processed if there is a lack of compliance with the law.

In order to proceed with this last recommendation, there is a need for civil society organizations and surrounding institutions to put the pressure on the banks by finding leverage points as well as strengthening the institutions that can protect the environment and communities. These items are beyond the scope of this research, but future research can focus on solving this. Although tackling corruption and convincing the national development banks to implement safeguards do not fall within the objectives of this research, the evidence presented can serve as a foundation for future work. The recommendations should be followed up with additional research in order to maintain the incredible and unique ecosystem of the Amazon.

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