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RESOURCE MANAGEMENT IN THE AMAZON. NORWAY'S ROLE IN THE AMAZON

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2 INTRODUCTION

Proper management of natural resources is important if the capability of the earth to sustain life is to be upheld. Management of natural resources entails taking care of the environment through varying activities such as preventing pollution and safeguarding natural resources e.g., rivers, tropical forests, and animals (Boucher, 2013). Protecting biodiversity is also viewed as the most important way of protecting nature, helping it remain intact, the same way it would be if humanity did not intervene (Daniel C. Nepstad et al., 2006). Most of the ecosystems in the world today are threatened, majorly due to human intervention. One of the major ways that humanity has redefined ecosystems is through human-driven climate change and natural resource exploitation. There is no denying that we need natural resources to survive, but our activities on the planet have harmed the ecosystems. Agriculture is one of the major ways by which people have invaded ecosystems, especially tropical rainforests (Martinelli et al., 2010). The problem of ecosystem degradation has been a hot topic for a long time. This is particularly the case now that people are more sensitized about the environment which has resulted in calls for action to avert further damage to our ecosystems such as the global push for sustainability (Correa et al., 2020). The Amazon is one of the most instrumental ecosystems and faces significant threats from human intervention such as deforestation and natural resource extraction.

Soybean cultivation in Brazil has significantly transformed the Amazon over the years. Its cultivation in Brazil has expanded significantly over the years, making Brazil the world leading exporter of soybean, recently overtaking the US (Cattelan & Dall'Agnol, 2018). Soybean cultivation has over time become a critical economic activity in Brazil, accruing to 14% of the total exports in the country back in 2015. Increased level of income in Brazil is largely linked to soy farming, thereby leading to an improvement in the living standards of the people, an aspect that is evident in the remarkable growth of HDI (Toloi et al., 2021). Linking economic prosperity to soybean cultivation has prompted more and more people to take up soya farming to improve their quality of life given the high rate of poverty in the country (Askeland, 2016). In addition, despite the incredible economic progress witnessed in Brazil in recent years, it is still considered a developing country. This means that Brazil depends on the intensive exploitation of natural resources to achieve the much-desired level of development (Brand & Wissen, 2017). Development activities in the Amazon have caught the attention of the international community given that the continuity of such activities would

eventually result in the degradation of the world's largest ecosystem. This has prompted various levels of intervention, the major one being Norway's interest to reduce deforestation in the Amazon through the Amazon Fund(Correa et al., 2020).

The Brazil-Norway relationship dates to 2008 when Norway recognized the efforts of Brazil's then government to reduce deforestation in the Amazon(Boucher, 2013). As a reward for such action, Norway pledged US\$ 1 billion through the Amazon Fund to fund projects linked to the reduction of deforestation, conservation, and protection of the ecosystem and biodiversity(Correa et al., 2019). The success of the Amazon Fund has made it one of the biggest programs under REDD+. The relationship between Brazil and Norway has progressed over the years and has extended beyond protection and conservation of the environment to economic relations based on the activities of Norwegian companies such as Equinox in the Amazon(Correa et al., 2020). In addition, Norway is listed as one of the major importers of soy from Brazil. Norway's role in the Amazon has been viewed as double-sidedness. This is because Norway recognizes that soybean is one of the major reasons for deforestation in the Amazon and yet it continues to source soya to produce feed for salmon farming, pig, cattle, and poultry production(Fearnside, 2001).

In this thesis, I intend to use various sources such as peer-reviewed journals, master thesis, books, newspaper articles, various reports e.g., government reports, organizational reports, and websites to answer the following research questions.

- How has soybean cultivation as a form of resource management impacted the Amazon?
- In what ways has the Brazil-Norway relationship especially through the Amazon Fund and economic links such as soy import to Norway affected the Amazon over the years?

There have been intentional efforts by Brazil. to protect the Amazon over the years. However, the nature of efforts towards the reduction of deforestation and protection and conservation of biodiversity has depended on the governments in power at any time. For instance, Lula Da Silva's government was more inclined towards observing environmental policies and concerted efforts to reduce the rate of deforestation in the Amazon(Pagliarini, 2023). On the other hand, Bolsonaro took a different approach and ignored environmental policies meant to protect the Amazon rainforest. His activities, such as the propagation of intensive development within the Amazon increased the vulnerability of the Amazon(Raftopoulos &

Morley, 2020). The mode of resource management in the Amazon has resulted in a massive transformation of the structure of the Amazon rainforest. Since Norway came into the picture and entered a pact with Brazil to protect the environment, prevent deforestation and protect biodiversity, a lot of positive developments have been observed(Birdsall et al., 2014). However, Norway's other activities in the Amazon, especially its continued sourcing of soy from Brazil have come under criticism, with critics calling it a good case of double-sidedness.

3 JUSTIFICATION

3.1 WHY THE AMAZON?

The Amazon rainforest is one of the most critical natural resources in the world today and has managed to attract immense attraction at local and global levels. The Amazon rainforest ecosystem is characterized by extensive biodiversity of animal and plant species and its large pool of natural resources(C. Nobre et al., 2021a). It is the largest tropical rainforest in the world. It covers about 5 million kilometers and 65% of this, about 3.4 million kilometers is located in Brazil, making it the largest tropical rainforest nation in the world(Boucher et al., 2013). To put the extent of biodiversity of the Amazon into perspective, the region contains 22% of vascular plant species, 14% of bird species, 9% of mammals, 8% of amphibians, and 18% of fish species of the total global biodiversity(C. Nobre et al., 2021a, 2021b). Although extensive research on the number of species in the Amazon has been done, it is believed that many species groups are yet to be discovered adding further to the amazing nature of the Amazon rainforest.

Although the Amazon has managed to be a topic of discussion for a while now due to its unique nature such as extensive biodiversity, a large pool of natural resources, and its size, the fact that it continues to be severely degraded has captured global attention as well(Ferrante et al., 2020). The Amazon rainforest is under great threat, particularly emanating from activities such as agriculture, infrastructure development, resource extraction, and logging(RAISG, 2020a). Resource management in Amazon forms the basis of this thesis since the mode in which it has been coordinated over the year has resulted in immense negative transformations(RAISG, 2020a). In addition to providing natural resources, the Amazon

rainforest plays a critical role in regulating climate change through CO₂ absorption(RAISG, 2020a).

The Amazon is also known for its extensive cultural diversity. It is home to about 410 indigenous groups and occupies territories that extend to about 2.3 million km² (RAISG, 2020a). The Amazon is highly critical to the survival of these indigenous people, hugely because they rely on the tropical forest for their survival(Kintisch, 2015b). Their entire lives revolve around the forests hence any sort of disturbance on the Amazon would put their existence at great risk. In addition, uncontrolled and illegal encroachment of the Amazon has been a root cause of violence in the region further threatening the indigenous people(Urzedo & Chatterjee, 2021).

Although about 80% of the Amazon is still intact, it is listed as one of the ecosystems that are under significant threat globally(Boucher et al., 2013). The biggest threat to the Amazon is deforestation especially resulting from soya plantation and cattle ranching, which has led to significant transformation in the Amazon over the years(Martinelli et al., 2010). Various forms of development carried out in the Amazon have also resulted in major transformations such as changes in vegetation cover (RAISG, 2020b). The Amazon, just like many parts of the world is not exempted from the impacts of infrastructure developments such as road construction and the presence of extractive industries(RAISG, 2020b).

3.2 TOWARDS A TIPPING POINT

There is no denying the fact that the amazon is under immense pressure. If no action is to be taken to reduce or stop this, there is bound to be damage so dire that it will be impossible to reverse. For instance, studies show that the Amazon rainforest is steadily losing its ability to absorb carbon dioxide, which is a critical ecosystem service, especially in climate change mitigation(Kintisch, 2015a). The extent of degradation happening in the Amazon came to the limelight and attracted a lot of attention during Bolsonaro's tenure(Urzedo & Chatterjee, 2021). His accelerated development in the Amazon and his repeated actions to ignore a structure put in place to protect the Amazon drove the Amazon further toward its deathbed(Song et al., 2021). Given the fact that 60% of the Amazon is in Brazil, neglectful actions towards Amazon in Brazil, are bound to have far-reaching consequences. Even though the Amazon is in the South American region, its importance stretches far beyond the

continent. The rest of the world depends on important ecological services such as acting as a carbon sink and a critical regulator for temperature change. For this reason, other nations have recognized the severity of the situation and made Amazon their business. There have been questions as to what extent the international community would be willing to go to prevent, stop or even reverse the damage in Amazonia.

The extent of human pressure on the Amazon rainforest right now is like nothing seen before. This pressure is a combination of various aspects ranging from ineffective environmental policies put in place over the years to intensive agriculture, and infrastructural development such as hydroelectric dams and highways(Ferrante et al., 2020). The building of roads has had dire consequences on the stability of the Amazon especially because highways have opened the very heart of the Amazonia making it more accessible and vulnerable to all sorts of detractors(Ferrante et al., 2020).

Progressive studies and research indicate that the Amazon has been experiencing extreme seasonal events such as drought and floods, a significant indication of climate change(Nobre et al., 2016). During the last decades, there have been records of high extreme droughts and floods, especially within the Amazon basin(Marengo & Espinoza, 2016). These events have resulted in an increased probability of forest fires, and extreme temperatures which have not affected the human population living within the Amazon and the species distribution. Increasing temperatures combined with prolonged droughts have also contributed to subsequent water shortages within the Amazon. As a consequence, there has been a serious dieback of the Amazon forests(Marengo & Espinoza, 2016). This has ultimately changed the structure of the Amazon from once a natural resource-rich ecosystem to one that is struggling with certain plant and animal life, an aspect reflected in a massive reduction in biodiversity(Nobre et al., 2016). Further experiments indicate that the Amazon's capability to capture CO₂ in the atmosphere has been severely compromised. Loss of forest cover over the years has meant that fewer and fewer trees take up CO₂ from the atmosphere to conduct photosynthesis(Kintisch, 2015b). In a world that is recently characterized by climate change, primarily due to escalating levels of CO₂ in the atmosphere from industrialization, we are counting on the atmosphere to offset a large portion of the CO₂ levels(Nobre et al., 2016).

4 LITERATURE REVIEW

4.1 AGRICULTURE IN BRAZIL

The amount of land converted for agriculture in the Amazon has increased significantly over the years. Records show that an increase of 647, 411 km² of land has been converted to agriculture in just 2 decades that is from 794, 429 km² in 2000(RAISG, 2020a). Agriculture is significantly responsible for the deforestation in the Amazon, transiting to about 84% of the total deforestation in the Amazon (RAISG, 2020b). The economic structure of the South American countries in this paying attention to Brazil is based on the Agriculture sector(Martinelli et al., 2010). Extensive agriculture has accelerated the rate of invasion of the Amazon. This is particularly evident in Peru where the residents of the Andean region migrate into the tropical forest, in search of more land to plant their crops (RAISG, 2020a).

Brazil over time has established itself as a center of large-scale commercial agriculture. It has worldwide recognition for its significant role in extensive domestic growth and increasing exports. The need for a modern form of development particularly adopted by Western countries has proved to be intriguing for emerging economies such as Brazil, China, and India (Martinelli et al., 2010). Brazil has particularly positioned itself around capitalism where the middle and upper class aim to adopt the 'northern' image of a good life(Brand & Wissen, 2013).

Given that Brazil is an emerging economy, and its level of industrialization is quite not the same as the West. Brazil is therefore bound to increase the exploitation of natural resources for economic development(Ferrante et al., 2020). This explains the reason for the expanding need for commercial agriculture such as cattle ranching and soya plantation, making it one of the leading beef producers globally(Martinelli et al., 2010). The increasing demand for soybean and beef especially in the western countries is also largely responsible for the accelerating rate of large-scale commercial agriculture in Brazil(Fearnside, 2001). The mode of consumption of the North has harmed the South (Brand & Wissen, 2017). In this case, Brazil's need to expand soybean plantations is as pressure to increase its exports to keep up with the global demand(Brand & Wissen, 2017). Therefore, a country like Brazil continues to exert pressure on its ecosystems(Fearnside, 2001). Even though we all understand that agriculture is not as profitable as industrialization hence the economic growth will take long before it gets to the desired level(Nobre et al., 2016).

4.2 SOYBEAN CULTIVATION IN BRAZIL

Soybean remains the major crop cultivated in Brazil in terms of both value and scale (Song et al., 2021). Soybean cultivation in Brazil has however not always been what we know it today. It was cultivated on a small scale up until the 1960s when it started spreading from the South region of Brazil to the Midwest regions (Bickel & Dros, 2003). The availability of plentiful and affordable land, a flat topography, and deep and well-drained soils are some of the aspects that have encouraged soybean cultivation in Brazil over time (Bickel & Dros, 2003). Soybean is the most widely cultivated crop in Brazil, covering about 23 million ha (Martinelli et al., 2010). According to soybean producers, traders, scientists, and agricultural producers, there are about 100 million hectares that can be exploited for soybean plantation and the intention here is to access most of it (Bickel & Dros, 2003). This would help capture the expanding global market for soy in European countries such as Norway where it is used as soymeal for animal feeds (Bickel & Dros, 2003).

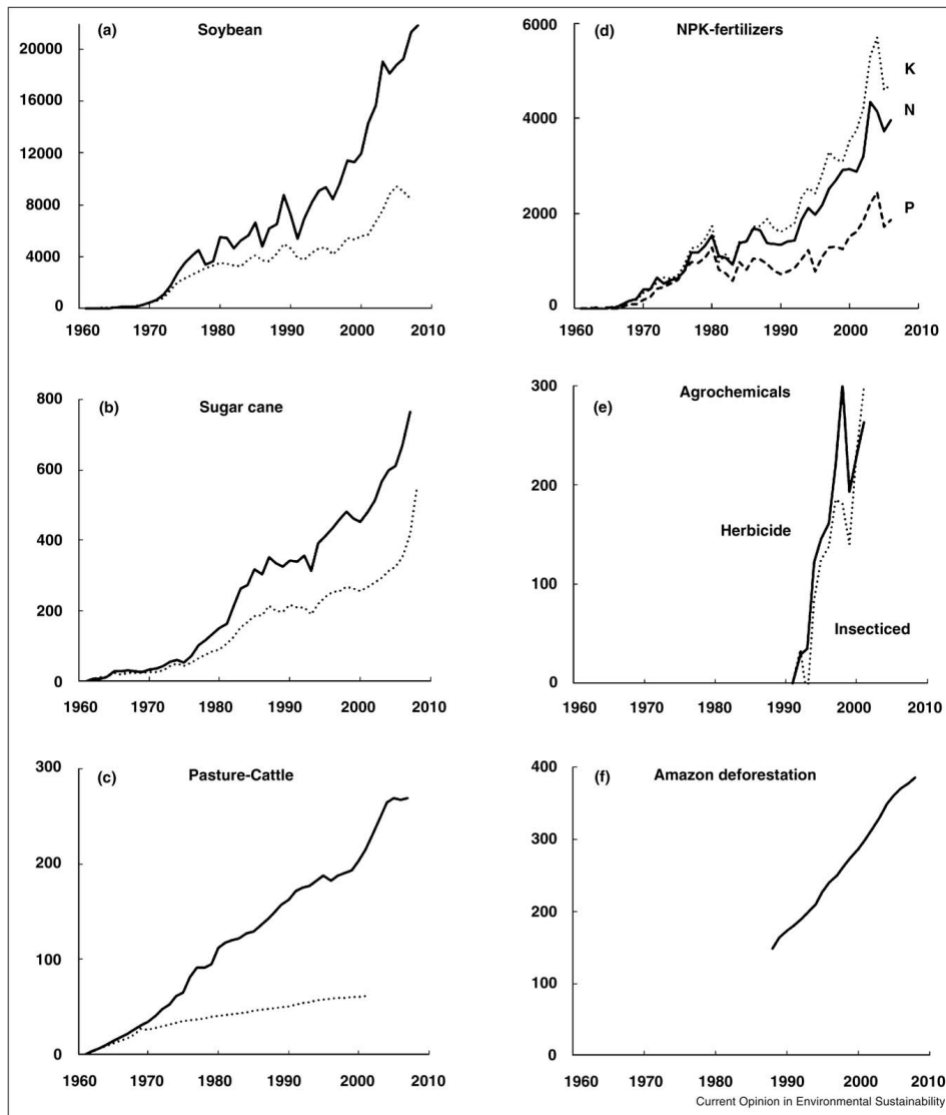


Figure 1: (The figure shows Amazon deforestation in relation to agricultural intensification in Brazil from 1960 to 2010 – source: www.faostat.fao.org.br)

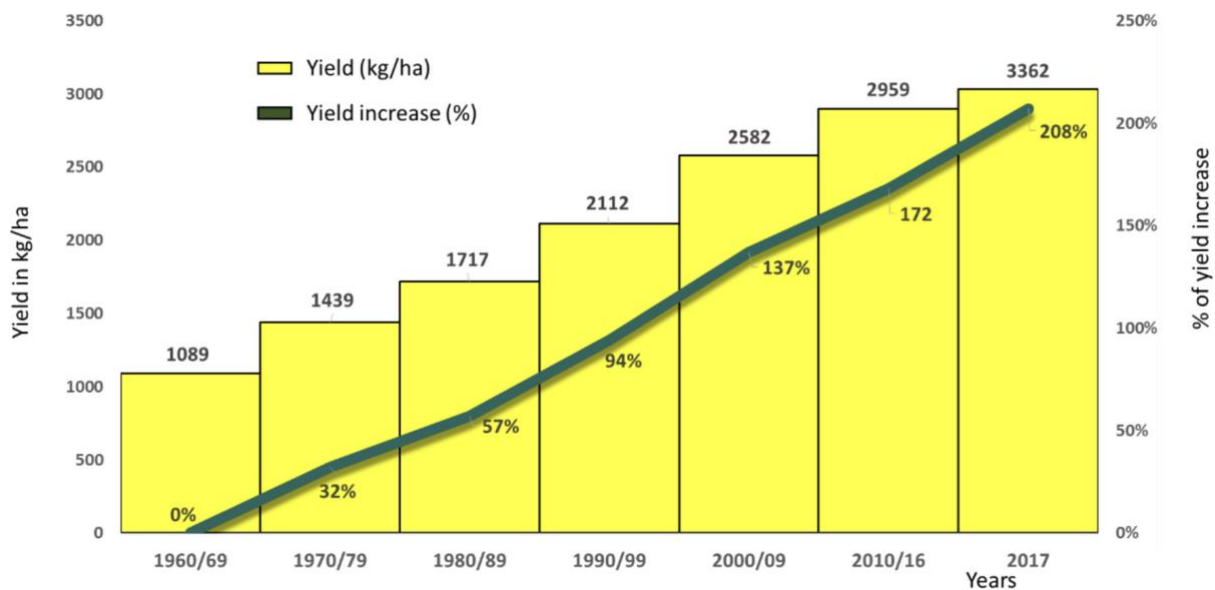


Figure 2: Increase in Soybean yield from 1960/69 to 2017 (sourced from [CONAB, 2017](#))

4.3 NORWAY'S NEED FOR IMPORTED SOY

Brazil- Norway's relationship has advanced over the year, from just environmental conservation and protection to becoming commercial partners. Most of the soy used in Norway's animal and fish farming is sourced from Brazil(Askeland, 2016). Imported soy to Norway is sourced from Mato Grosso state in the west of Brazil(anne Kari garberg (Fivh), 2014). Most of the export of soy from Brazil to Norway is done by Denofa, a company co-owned by Norway and Brazil(anne Kari garberg (Fivh), 2014). Readily available soy from Brazil has enabled Norway to process enough feeds for poultry, pig, and fish farming(Askeland, 2016). Norway's need for imported soy is so critical that according to the Norwegian Farmers Union if there was a slight delay in the shipment of soy from Mato Grosso to Norway, pig, chicken, and fish farming would be severely devastated(anne Kari garberg (Fivh), 2014).

Norway has become less and less self-sufficient in soy over the years, an aspect that has resulted to increase reliance on soy from Brazil(Askeland, 2016). The amount of soy sourced from Brazil increase remarkably over the years. According to statistis, the amount of imported soy in Norway was nearly zero in the 2000s, however, the amount shot to 368,000 tonnes in 2013(anne Kari garberg (Fivh), 2014). Imported soy from Mato Grosso by Denofa was sold to

various customers in Norway, the major one being the Norwegian Agricultural Purchasing and Marketing Corporation (Felleskjøpet)(anne Kari garberg (Fivh), 2014).

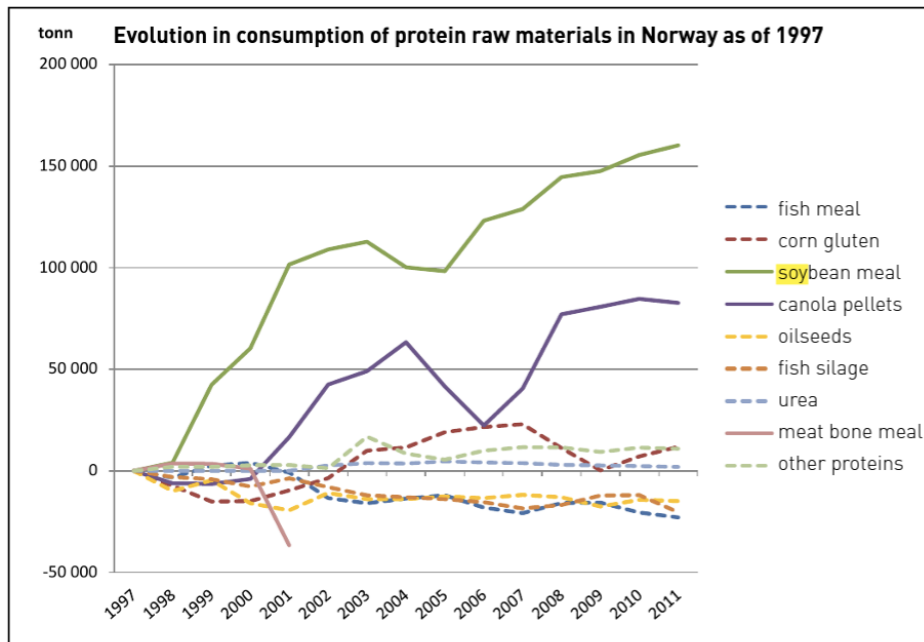


Figure 3: The figure indicates an increase in soybean meal in Norway over the years

4.4 THE AMAZON FUND

The Amazon fund was brought forth in March 2004 when the Brazilian government began a series of policies and enforcement actions aimed at scaling down the rate of deforestation in the Amazon (Birdsall et al., 2014). In the continuity of a similar line of action, Brazil signed an agreement with Norway promising more concerted efforts toward reducing deforestation(Høie, 2020). The Norway-Brazil agreement stated that Brazil would receive annual funding of about US\$ 1 billion from the Norwegian government towards its initiative to reduce deforestation and push for the conservation and protection of ecosystems and biodiversity(Høie, 2020). The payments would be directed to the Amazon Fund. The Amazon Fund would focus on instigating various projects such as management of the Amazon rainforest and protected areas, monitoring and environmental control, sustainable forest management, preservation and conservation of biodiversity, and reinstating deforested zones

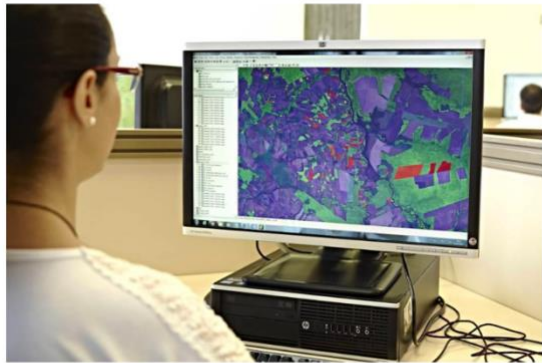
in Brazil(Correa et al., 2019). In addition, about 20% of the Amazon Fund payments would be put into conservation measures and controlling deforestation in other tropical countries as well(Birdsall et al., 2014). The Amazon fund came to light as one of the biggest programs under REDD+ (Van der Hoff et al., 2018).

According to statistics, by December 2012, about \$ 216 million had been allocated to about 34 projects in the Amazon. The average fund allocation to various projects ranges from US\$ 2 million to US\$ 8 million annually(Birdsall et al., 2014). Some of the biggest allocations from the Amazon Fund are directed towards the Payment for Ecosystem Services (PES) scheme and to the Brazilian Forest Service for the betterment of the National Forestry Inventory(Forstater et al., 2013). To some extent, the Amazon Fund is also accessible to some selected number of well-established NGOs for example, The Nature Conservancy, Amazon, and IPA(Forstater et al., 2013). These organizations are known to work side by side with government agencies to improve the efficiency by which the disbursements from the Amazon Funds are used(Høie, 2020).

The Amazon Fund was put under the management of the Brazilian Development Bank (BNDES). BNDES was tasked with making sure that the funds were put to the intended purpose, monitoring the projects under the Amazon Fund, rendering accounts, and reporting back on the progress of the Amazon Fund(Forstater et al., 2013). The Amazon Fund also has a committee, the Guidance Committee (COFA) that does a proper analysis of the findings provided by BNDES and establishes proper guidelines by which the Amazon Fund reimbursements are to be used (Høie, 2020). In addition, the Technical Committee (CTFA) works side by side with COFA to ensure that all the calculations made by the Ministry of Environment in Brazil on reductions of carbon emissions as a result of reduced deforestation are accurate(Birdsall et al., 2014).

4.4.1 THE AMAZON FUND IN NUMBERS

Monitoring and control



1,1 million

RURAL PROPERTIES REGISTERED IN RURAL ENVIRONMENTAL REGISTRY



1,706

ENVIRONMENTAL INSPECTION MISSIONS

Science, innovation and economic instruments



613

SCIENTIFIC OR INFORMATIONAL PUBLICATIONS PRODUCED



387

RESEARCHERS AND TECHNICIANS INVOLVED IN RESEARCH, DEVELOPMENT AND INNOVATION (RD&I) ACTIVITIES

Territorial Management



195

PROTECTED AREAS SUPPORTED



101

INDIGENOUS LANDS IN THE AMAZON SUPPORTED



52 millions hectares

EXTENSION OF PROTECTED AREAS WITH STRENGTHENED ENVIRONMENTAL MANAGEMENT



59,000

INDIGENOUS PEOPLES DIRECTLY BENEFITTED

Sustainable Productive Activities



384

INSTITUTIONS SUPPORTED DIRECTLY AND THROUGH PARTNERS



R\$ 254 million

IN PROCEEDS FROM THE SALE OF PRODUCTS



74 million hectares

EXTENSION OF FOREST DIRECTLY MANAGED



207,000

PEOPLE BENEFITED FROM SUSTAINABLE PRODUCTIVE ACTIVITIES

5 DISCUSSION

5.1 SOCIAL-ECOLOGICAL IMPLICATIONS OF AGRICULTURE IN THE BRAZILIAN AMAZON

Agriculture has played an instrumental role in defining the social-ecological structure in Brazil. Brazil's push for development through extensive agricultural activities might have played a critical role in putting Brazil on the global map as one of the fastest-growing economies (Martinelli et al., 2010). However, the expansion of agriculture in Brazil comes at a huge price as well. Agricultural development such as soybean cultivation and cattle ranching has resulted in unchecked exploitation of critical natural resources, that as the Amazon rainforest (Martinelli et al., 2010). Extensive agriculture in Brazil has not only ecological implications on the Amazon but social implications as well (Lima et al., 2011). Some of these social-ecological impacts of agriculture in Brazil entail massive degradation of the Amazon rainforest, environmental implications, problems in land consolidations, and heightened inequality that involves social inequity, income inequality, and inequality in land distributions (Martinelli et al., 2010). This mode of agriculture propagated in Brazil goes against the very principle of sustainable development.

5.1.1 THE WAY TO ECONOMIC PROGRESS

Soybean cultivation is viewed as the most probable route toward achieving economic development and eliminating poverty in Brazil (Lima et al., 2011). The states that have ventured into soybean cultivation have managed to acquire higher Human Development Indexes (HDI) compared to states that do not have any soybean cultivation (Cattelan & Dall'Agnol, 2018). According to a study, the HDI in soybean-growing regions increased by 68% between 1970 and 2010 (Cattelan & Dall'Agnol, 2018). This was partly due to an increase in the amount of income earned by soya farmers especially because of an increase in foreign exchange (Song et al., 2021). This reflects a great improvement in the livelihoods of the people (Bickel & Dros, 2003). Another positive social impact of soybean cultivation in Brazil is the creation of job opportunities (Toloi et al., 2021). According to a study conducted

by CEPEA, agribusiness in Brazil, which is heavily shaped by soybean cultivation, resulted in the creation of 19.1 million jobs in 2015(Toloi et al., 2021).

Soybean cultivation in Brazil is an instrumental driving force for agricultural development. Soybean is currently the most exported product in Brazil accounting for 14% of the total exported products in 2015(Toloi et al., 2021). Most of the Soyabean cultivated in Brazil is exported to China(Cattelan & Dall’Agnol, 2018). China’s economy has exhibited remarkable growth in recent years which could mean that the demand for soybean will go higher(D. C. Nepstad et al., 2006). Some of the soybean is also exported to Norway where it is used in agriculture especially salmon farming(515, 2016). According to statistics from the Brazilian vegetable oil industry, in 2016, 96.2 Mt of soybean was produced in Brazil out of which 56.6 Mt were exported(Cattelan & Dall’Agnol, 2018). The rest of the soybean consumed locally was used in biodiesel production and other domestic consumption(Cattelan & Dall’Agnol, 2018). This shows just how soybean has been critical to the economic improvement and stability in Brazil(Fearnside, 2002). Soybean cultivation could be an instrumental tool in reducing or even ultimately eliminating poverty in South America (Cattelan & Dall’Agnol, 2018). The question as to whether this is the case will be discussed in this paper later.

5.1.2 THE PROBLEM OF LAND DISTRIBUTION

Agricultural development in Brazil is responsible for the increased skewness in land distribution. The issue of land distribution has been problematic over the years, an aspect that is evident in the increased rural violence due to the lack of title deeds(Martinelli et al., 2010). This has eventually resulted in economic destabilization in the affected regions, making it even more difficult to propagate any form of development(Martinelli et al., 2010). The scramble for agricultural land has led to increased land grabbing and unscrupulous land transfer deals(Bickel & Dros, 2003). For instance, an investigation by Interpi and the State Land Agencies revealed that about 80% of land owned in the Piaui region was illegally obtained(Bickel & Dros, 2003). This irregular land acquisition has worked against the vulnerable in society, for example, the rush to acquire large pieces of land for large-scale plantations of soybean has resulted in small-scale farmers getting pushed out of their land(Bickel & Dros, 2003). In the region of Piaui, records show that about 240,000 people are

landless(Bickel & Dros, 2003). Other people end up forced to migrate to the cities which eventually leads to the transformation of population dynamics(Bickel & Dros, 2003).

5.1.3 TRIGGERING SOCIAL INEQUALITY

Soybean cultivation in Brazil is viewed as a recipe for social inequality. The overall Gini coefficient, a measure of the level of inequality, stands at 0.77 in Brazil and this is considerably high(Martinelli et al., 2010). A major form of inequity is observed in the education system where about 10% of the population which translates to about 20 million people remain illiterate(Martinelli et al., 2010). In addition, the average number of years spent in school in Brazil is relatively low compared to other countries(Martinelli et al., 2010). Education is a critical tool in today's world and a high level of illiteracy is one of the constraints to modern development.

Although the level of poverty has considerably decreased over the years, it remains a big problem in society(Martinelli et al., 2010). According to statistics, about 20% of the Brazilian population is still considered poor(Martinelli et al., 2010). This level of poverty is reflected in the inability of a large part of the population to acquire food security(Martinelli et al., 2010). Statics also indicate a high level of income inequality in Brazil as most of the revenues generated from soy farming mostly go to the rich since they control most of the large-scale soy farms in Brazil(Garrett & Rausch, 2016). There are also criticisms directed toward the soy sector in Brazil since most of the income from soy cultivation goes to non-Brazilians due to a surge of foreign investment in the country(Garrett & Rausch, 2016). In addition, due to the emergence of large-scale soy cultivation in Brazil, this means that there hasn't been a chance for 'small' farmers to enjoy a share of the 'cake'. Most of the poor people in Brazil have mostly resolved to sell their land to the rich and big companies and looked for alternative forms of survival(Cattelan & Dall'Agnol, 2018). This put them at risk of going back to poverty or remaining in poverty.

5.1.4 THE CAUSE OF FOOD INSECURITY

About 36% of the population is said to suffer from malnutrition, while about 14 million people face hunger (Martinelli et al., 2010). A high level of poverty means that people are unable to acquire quality food or generally suffer from hunger. There is a growing market for biofuels instigated by the need to shift to renewable energy and the reduction of the use of fossil fuels for sustainability (Boddiger, 2007). It is highly unlikely that European countries can self-sustain when it comes to the production of biodiesel (Brand & Wissen, 2013). This means that developing countries such as Brazil are bound to take advantage of the growing market for biodiesel by producing more soy (Cattelan & Dall'Agnol, 2018). Expansion of soy cultivation would mean that most farmers will be prompted to plant cash crops such as soy as opposed to food crops, an aspect that will potentially result in food insecurity (Boucher et al., 2013). An increase in the market for soy is also bound to result in an increase in the price of staple food, thereby increasing food inaccessibility especially among the poor (Boddiger, 2007).

5.1.5 IMPACT ON THE BIODIVERSITY

Soybean cultivation has proven to be a big threat to tropical biodiversity in the Amazon. The surge of soybean cultivation in Brazil has been a tool for environmental degradation in various ways (Fearnside, 2002). To begin with, high global demand for soybean has stimulated large-scale cultivation for soy which has in turn resulted in land encroachment, especially in the Amazon rainforest. This has as a result triggered a series of deforestation activities that have proven to be catastrophic to the stability and biodiversity of the Amazon (Fearnside, 2002). Second, soybean is linked to infrastructural development, such as the establishment of road networks, an aspect that has catalyzed the destruction of the Amazon (Fearnside, 2002). With the growing demand for soybean globally, there has been a need to increase the transportation network in the Amazon thereby making it more accessible to external disturbances hence making it even more vulnerable (Cattelan & Dall'Agnol, 2018). It is projected these negative impacts of soy farming will continue to magnify as the demand for soy from Brazil is giving in to the global market forces, that continue to get stronger and stronger and yearn for more soybean (Fearnside, 2002). This therefore means that soybean cultivation will continue being

instrumental in shaping the mode of land use which will in turn unleash a series of destruction on natural habitat by changing the distribution of both plants and animals in the once biodiversity-rich Amazon.

5.2 THE ROLE OF POLITICS ON THE STABILITY OF THE AMAZON RAINFOREST

Politics have played an incredible role in defining the structure and state of the Amazon. To bring into light how politics have impacted the Amazon, I will particularly investigate former president Bolsonaro's regime and how it impacted the Amazon over the years (Urzedo & Chatterjee, 2021). During his tenure, Bolsonaro, on numerous occasions received intense criticism both locally and internationally. The criticisms were a result of increased deforestation in the Amazon, the destruction of the ecosystem and biodiversity of the world's most critical ecosystem, and most importantly displacement of the indigenous communities in the Amazon (Raftopoulos & Morley, 2020). Bolsonaro's push for industrialization, ignoring environmental policies meant to protect the Amazon, and cultivation of lawlessness that saw illegal encroachment into the Amazon have been a topic of discussion over the years (Correa et al., 2020). In addition, Bolsonaro continually displayed great hostility towards international governments that supported the conservation of the Amazon (EcoWatch, 2019). Bolsonaro consistently expressed his displeasure towards international governments especially those based in the West, accusing them of their intentions to exploit the Amazon themselves and undermine the sovereignty of Brazil (Raftopoulos & Morley, 2020). For instance in 2019 when the Amazon was being consumed by the fire, it is said that Bolsonaro angrily rejected \$22 million international aid from G7 aimed towards preventing further damage by fire (EcoWatch, 2019). In relation, Norway had to cut short the Amazon fund that was critical in the conservation measures in the Amazon due to Bolsonaro's activities in the Amazon such as undermining critical environmental policies (Birdsall et al., 2014).

5.3 THE ISSUE OF BRAZIL'S SOVEREIGNTY

The issue of Brazil's sovereignty, especially concerning the management of the Amazon has been brought to discussion numerous times. The mode by which Brazil has managed the Amazon rainforests has raised questions as to whether other countries should intervene, given the fact that the Amazon is considered "the lungs of the planet" (Walt, 2015). The consequences of its destruction do not fall on the South American region alone but on other parts of the globe as well (Walt, 2015). One would wonder whether the destruction of the Amazon would come to an abrupt stop if a more powerful body intervened and held Brazil accountable for how it handled the Amazon over the years. It is important to investigate the importance of stopping people like Bolsonaro from coming into power and unleashing massive destruction into the ecosystem thereby putting everything else survival at risk.

Brazil's constant push for development in the Amazon has been viewed as an environmental threat to the world and said to be a ticking time bomb that will explode to everyone's faces in due time (Fearnside, 2001). Questions of climate change have been a hot topic, in the sense that the Amazon rainforests are recognized to be instrumental in averting further climate change through increased CO₂ uptake (Zhang et al., 2022). More and more people are now coming to terms with the issue of climate change. More people, including ecologists, scientists, researchers, and others have continually expressed concern and called for swift action to derail further destruction of the Amazon (Levis et al., 2020). The international government's intervention in Amazon has been perceived as critical, especially in forcing Brazilian governments to be accountable for the conservation of the Amazon (Correa et al., 2020). This resulted in the creation of the Amazon Fund, a program under REDD+, that has led to important progress in the reduction of deforestation, conservation, and protection of biodiversity in the Amazon (Brand & Wissen, 2013; Høie, 2020). However not all kind of international intervention has been taken positively in Brazil, and to some extent, actions by the international community in the Amazon has been perceived as a potential threat to Brazil's sovereignty (Raftopoulos & Morley, 2020). This aspect elicited various forms of defiance such propagation of massive development in the Amazon, and ignoring existing environmental policies, especially from former President Bolsonaro (Lima et al., 2011). As a result of such actions, Bolsonaro's government was imposed with sanctions from the West for failure to adhere to environmental policies on the Amazon (Boucher et al., 2013).

5.4 THE AMAZON FUND TO THE RESCUE

The Amazon fund came to light in 2004 and grew to become one of the biggest programs under REDD+. Since its launch, the Amazon Fund has realized major success, a factor that resulted in its extension and expansion from December 2013 to December 2021 (Birdsall et al., 2014). Since its formation in 2004, the Amazon Fund has instigated the stability and effectiveness of the Environment Ministry in Brazil (Correa et al., 2019). Solidifying the mandate and effectiveness of the Environmental Ministry was a critical development since had the necessary legitimacy and resources needed to actualize the important environmental policies (Birdsall et al., 2014). The US \$ 1 billion that Norway pledged towards conservation measures in the Amazon has been instrumental over the years, majorly towards the reduction of deforestation, protecting, and reinstating biodiversity (Levis et al., 2020). The Amazon fund has also relieved financial pressure on the Brazilian National Treasury since propagating conservational measures in the Amazon is a costly endeavor (Birdsall et al., 2014).

5.4.1 THE SUCCESS OF THE AMAZON FUND

The launch of the Amazon Fund was perceived as a way through which other countries such as Norway could help how resource management in the Amazon was propagated, without threatening Brazil's sovereignty (Birdsall et al., 2014). International involvement in Brazil has been met with sharp criticism at some point (Birdsall et al., 2014). This was particularly evident in the activities of President Bolsonaro, who at some point even rejected foreign aid to help stop the fast-spreading forest fires in the Amazon in 2019 (EcoWatch, 2019; Raftopoulos & Morley, 2020). Bolsonaro claimed that the involvement of the West in the conservation of the Amazon was a way for the West to exploit the Amazon itself (Raftopoulos & Morley, 2020). However, the arrival of the Amazon fund and the nature of the relationship between Brazil and Norway was seen to be effective and beneficial to conservational efforts and the reduction of deforestation in the Amazon (Birdsall et al., 2014). The Amazon Fund is responsible for funding numerous projects in the Amazon geared towards the protection and conservation of biodiversity (Correa et al., 2019). Through the Amazon, Fund the relationship between Brazil and Norway has exhibited positive progress over the years (Birdsall et al., 2014). Brazil and Norway's relationship has gone beyond the conservation and protection of

the Amazon, extending to economic benefits between the countries, for instance through soy imported to Norway from Brazil(Song et al., 2021).

5.4.2 THE CHALLENGES FACING THE AMAZON FUND

Although the Amazon Fund has had lots of success since its launch, it has faced a couple of challenges along the way as well. The Amazon Fund was up to a slow start. Despite regular funding from Norway, reports indicated a massive increase in deforestation especially during Bolsonaro's tenure as Brazil's president(Maeda et al., 2021). Some of the activities by Bolsonaro after he came to power in 2018, derailed efforts for the conservation of the Amazon, thereby overshadowing any positive progress made because of the existence of the Amazon Fund (Høie, 2020). President Bolsonaro introduced various policies that catapulted deforestation such as cutting down Ibama's budget thereby constricting its mandate ability to punish violators of environmental conservation policies(Høie, 2020). In addition, Bolsonaro dismantled the technical committee and the Amazon Funding Guiding Committee (COFA)(Forstater et al., 2013). This reduced the effectiveness by which the funds from the Amazon Fund were managed.

Various sections have questioned the effectiveness of the Amazon Fund, citing that its approach might not be the most probable way to deal with the problem of deforestation in the Amazon(Correa et al., 2019). The Amazon Fund is structured to instigate projects rather than focusing on being more strategic in their approach, for instance by dealing with environmental policies(Birdsall et al., 2014). There are also worries in various sections that the Amazon Fund is not sustainable particularly since Brazil is not oriented towards sustainability(Van der Hoff et al., 2018). This would frustrate Norway since its main mission is to achieve sustainable development(Birdsall et al., 2014). This was evident when Norway decided to halt its contribution towards the Amazon Fund after Bolsonaro's activities in the Amazon contradicted the initial Brazil-Norway agreement(Raftopoulos & Morley, 2020). The agreement was result based, where Norway pledged US\$ 1 billion annually due to Brazil's efforts to reduce deforestation and overall carbon emissions.

5.5 THE ROAD TOWARDS A SOCIAL-ECOLOGICAL TRANSFORMATION

More people from various parts of the world are beginning to understand the criticality of environmental degradation. This kind of understanding and concern for the ecosystem has led to a significant increase in calls to take much-needed action to avert further ecological crises. The issue of various environmental policies has dominated the media in recent times and the many global environmental conferences are an indication of the willingness to realize a transformation that will help increase the resilience of various ecosystems (Brand & Wissen, 2013). More schools are now beginning to incorporate environmental sustainability studies into their curriculums (Brand & Wissen, 2013). These are just part of many examples of what is happening in the world, serving as evidence that there is an apparent effort in many parts of the world, and this could serve as a beacon of hope. The question now is whether we are doing the right thing or rather doing enough, or maybe there is more that needs to be done and we are probably not ready to do what it takes. This is based on the aspect that global temperatures continue to rise, proving that we are far from getting ourselves out of the danger zone (Kintisch, 2015b). For instance, the activity in the Amazon is proof that it's taking unnecessarily long to realize that the time for effective environmental action is now.

The road to achieving the much-desired ecological transformation is uncomfortable, we could even term it as somehow complicated. To adopt and follow a transformational path toward sustainability, we need to make a couple of changes (Brand & Wissen, 2013). These changes entail redefining lifestyle mode, revolutionizing global corporations, objecting to policies that negatively impact the environment, carefully dealing with some of the permanent cross-generation changes and most important taking a detour from extractive imperialism fueled by capitalism (Brand & Wissen, 2013). The international community is calling for sustainable development (Correa et al., 2019). This is a development that protects the environment, takes care of the needs of the current generation, and still manages not to compromise the well-being of future generations (Nobre et al., 2016). Brazil has been called out multiple times and has been pressurized towards adopting sustainable development which is devoid of increasing the vulnerability of the Amazon ecosystem (Nobre et al., 2016). For instance, former Brazilian president Bolsonaro came under intense criticism for ignoring apparent environmental policies and pushing for nature exploitative development that resulted in record-high deforestation in the Amazon (Raftopoulos & Morley, 2020).

It is easy to call for sustainable development in Brazil but actualizing it to avoid an apparent ecological crisis is rather hard, more so, complicated. To begin with, Brazil is considered a developing country with promising economic progress that could see it join the likes of China (Brand & Wissen, 2013). Being a developing country, therefore means that Brazil lacks the necessary industrial muscle to propagate the economy at the desired pace (Brand & Wissen, 2017). As discussed earlier in this thesis, Brazil, therefore, relies heavily on intensive agricultural activities such as soybean cultivation and cattle ranching to propel a huge section of its economy (Martinelli et al., 2010). Urges towards Brazil to instigate a mode of development that doesn't negatively impact the Amazon have therefore not been popular among some sections, especially among politicians such as former President Bolsonaro (Lima et al., 2011). His extractive mode of development saw an immense increase in activities in the Amazon resulting in a record-high deforestation rate (EcoWatch, 2019). This made him a target for worldwide criticism and sanctions from Western countries (Boucher, 2013).

Recent trends of development give us hope for social-ecological transformation that can the Amazon crawl back to its former glory. The coming into power by President Lula Da Silva has been perceived as a beam of hope for the protection of the Amazon (Pagliarini, 2023). Reports claim that President Lula da Silva is geared towards reversing Bolsonaro's detrimental approach to the environment (Pagliarini, 2023). During his inauguration speech, Lula stated that *“ Our goal is to achieve zero deforestation in the Amazon and zero greenhouse gas emissions in the electricity matrix, in addition to encouraging the revitalization of degraded pastures. ”* (Pagliarini, 2023). In addition, Lula insisted that it was not necessary to process deforestation for Brazil to maintain and expand its agriculture frontier (Pagliarini, 2023). This gives hope to the international community that the fate of the Amazon is not entirely doomed after all. Should Lula keep his word, we could start witnessing a resuscitation of policies that were meant to strengthen environmental protection, reduction of deforestation, prevent illegal land grabbing, and gear Brazil toward achieving sustainable development (Boucher et al., 2013).

6 CONCLUSION

Agriculture is the backbone of Brazil's economy. For instance, soybean is categorized as the most exported productive in Brazil, translating to about 14% of the total exports in 2015. Records indicate a 68% increase in the human development index (HDI) in regions where soybean cultivation is done. However, agriculture is responsible for the immense degradation of the Amazon since people have resulted to cutting down trees to create land for soy plantations and cattle ranching. For Brazil to put an end to deforestation and other forms of environmental degradation such as the release of farm chemicals into the ecosystems, it would mean that the mode of agriculture would have to change. For instance, there have been calls to rethink large-scale soya cultivation which is known to have degrading environmental consequences.

The growing demand for soybean is largely responsible for the expanding soy cultivation in Brazil. The mode of production of soy in Brazil has been termed to be proper environmental degradation especially because soy is one the greatest proper of deforestation in the Amazon. Norway is one of the European countries with a great need for imported soy particularly in recent years that have been marked for insufficient locally produced soy. Further, the growing salmon, pig, and poultry farming in Norway has propagated an elevated need for feed production, mostly from soy. Issues issue have been raised relating to Norway's activities in the Amazon. Given the fact that Norway pushes for sustainability and environmental protection, it would be perceived as a reflection of double-sidedness to then go ahead to acquire soy from Brazil. This is because most soy cultivation in Brazil has fueled environmental degradation through increased deforestation.

The question therefore here becomes; how would Brazil maintain or even improve its economic status without having to overexploit natural resources? Is it possible to do agriculture sustainably? It means that for Amazon to retain its former glory, it would mean that people would have to put their hands off Amazon. Due to growing awareness of the environment and climate change, markets and financial institutions are pressuring soy farmers and cattle ranchers to exercise better social and environmental performance. In addition, vigorous exercises would have to be set in motion to protect and restore the Amazon, something that the recently elected Brazilian President Lula da Siva vowed to achieve.

The Brazil-Norway relationship can be termed as one of the best things that happened to the efforts to conserve and protect the Amazon. The Amazon Fund came at a time when Brazil needed it the most. Norway's move to pledge US\$ 1 billion annually towards the Amazon fund helped relieve Brazil from the immense financial pressure that came from conservation measures. The Amazon Fund was also critical given the fact that Brazil is considered a developing country with most of its resources focused on economic development as opposed to environmental conservation. Of course, the Amazon Fund had its share of challenges, but its successes have also made such instrumental impact, especially in the war against deforestation in the Amazon.

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