

Executive Summary

The main objective of this report is to document research conducted at The Hague University of Applied Sciences on how Brazilian deforestation policies have contributed to the achievement of Sustainable Development Goal # 13. This report is written due to the numerous discussions regarding the scientific evidence for the link between climate change and deforestation of the world's rainforests. Deforestation of the Brazilian Amazon rainforest is one of the major causes to climate change and one of the biggest threats to development. The United Nations has stated that to combat and reduce impacts of climate change, it is important to promote sustainable development. The Sustainable Development Goal # 13 is one out of 17 goals initiated by the United Nation Development Programme as a part of the 2030 Agenda for battling the effects of climate change through sustainable development. The central goal of this research is to determine to what extent the Brazilian deforestation policies have contributed to the achievement of Sustainable Development Goal # 13. In order to answer the main goal, different research methods were used, such as desk and field research, by observing reports published by the United Nations, consulting the official governmental page for Brazilian laws, and conducting interviews with experts within the field of Brazilian politics and forest conservation. The research showed that the Brazilian deforestation policies have contributed to the achievement of Sustainable Development Goal # 13 to some extent. The evidence suggests that the Brazilian Government has achieved some of the criteria of the goal, such as including civil society in policy development, raising public awareness regarding the effects of climate change, and decreasing greenhouse gas emissions linked to deforestation. However, the political criteria of the goal have not been achieved, such as strengthening deforestation policies, taking accountability, and ensuring that the deforestation policies are being adhered to at a regional level. In addition, the United Nation Development Programme has ranked Brazil in the 55th percentile of achieving SDG13, and no further measures have been taken since this ranking due to the current political turmoil in Brazil. Moreover, the research also found that not all the criteria of the goal are measurable, creating boundaries for the research. Therefore, it is recommended that more information on the criteria of the goal is released, and that further research on the achievement is conducted.

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Preface

The basis of this research originally stemmed from my passion for Brazil and sustainable development. As the world moves further and the issue of climate change becomes more prominent, it is essential to defeat the several threats to development. How will we face these challenges? It is my passion to not only find out, but to develop and promote sustainable solutions to break down barriers for future generations.

In truth, I would not have been able to achieve my current level of success without a strong support group. First of all, I would like to express my sincerest gratitude to my thesis supervisor Mr van Munster for his continuous support and encouragement, both during my internship in Brazil and through the thesis process. Secondly, I would like to thank my parents and family for their love, endless encouragement, and for teaching determination. And finally, I would like to especially express my gratitude to my friends and fellow students for their memorable companionship and moral support through all the ups and downs of the academic-and personal life during these four years at The Hague University of Applied Sciences. Thank you all for your unwavering support.

1. Introduction

As scientific evidence for the link between climate change and emissions of greenhouse gasses (GHG) is becoming more and more compelling, many states and international organisations have been developing approaches to act and reduce impacts of said climate change. The United Nations (UN) has stated that climate change presents the single biggest threat to development, and in 2015, an historic UN summit brought into light one of the most important initiatives regarding sustainable development and battling climate change, known as the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development (United Nations, 2018). To address climate change, the UN has created Sustainable Development Goal # 13, the goal which seeks to urge the global community to act and tackle the issue of an alarming abnormal change in the climate. The achievement of Sustainable Development Goal # 13 (hereinafter SDG13) depends on the success of a number of different actions, such as the reduction of GHG emissions, such as CO₂, and various mitigation and adaption measures. An important factor in combatting climate changes and dealing with CO₂ emissions is the world's tropical forests. Many scientists refer to the different forests as the *lungs of the Earth*, as the unique eco-system of the dense rainforests consume an immense amount of the global GHG emissions and release Oxygen in return (Butler, 2017). However, massive deforestation around the world has seriously reduced the capacity of CO₂ storage, and one of the most severe cases can be found in the Brazilian Amazon forest. Between 1970 and 2017, there was a total forest loss of approximately 769,000 sq. kilometres, equivalent to 18 times the size of the Netherlands, in the Brazilian Amazons due to deforestation (Butler, 2017). In 2014, it was reported that more than 600 million trees were estimated to have been removed from the Amazon region of Brazil solely in the year of 2009 (Ometto, Aguiar, & Martinelli, 2014).

Deforestation has been long overlooked as a contributor to climate change, but the changes caused by climate change due to deforestation have led to consequential social and environmental disruptions (Hadlock, 2016). The main objective of this thesis is to investigate to what extent Brazilian deforestation policies have contributed to the achievement of SDG13. In order to reach this objective, the research has been divided in to three different sub-questions. The main sub-questions addressed in this thesis are, what does the SDG13 and its sub-targets entail, what deforestation policies have been developed and implemented by the Brazilian government, and how successful has the Brazilian Government been in achieving SDG13 through deforestation policies? The introductory chapter briefly discusses the background for deforestation of the Brazilian

Amazons and its effects on climate change. Subsequently, the next chapter discusses the SDG13, presents its targets in relation to deforestation and GHG emissions, and analyses the criteria framework from the UN of SDG13. The next chapter will provide a comprehensive analysis of the legal text and effects of the most prominent Brazilian deforestation policies. The final chapter will evaluate the deforestation policies through the criteria framework of SDG13 and assess how successful the Brazilian Government has been in achieving the different criteria.

1.1 Deforestation of the Brazilian Amazon

The Amazon Rainforest, is the home to approximately 10 million species of animals, plants, and insects, including hundreds of species who are yet to be published in the encyclopaedias (Dillinger, 2018). It is the single largest rainforest in the world, spanning across nine South American countries, with the majority of the forest, roughly two-thirds, situated within the Federative Republic of Brazil (Yale School of Forestry & Environmental Studies, 2018). The forest covers almost 60 per cent of the entire area of Brazil, equivalent to just under 3 million sq. kilometres, known as the Brazilian Amazon (Meyer, 2010). As it is the world's largest rainforest, containing more than 390 billion individual trees, it is also known to be the home to the Earth's largest eco-system (Butler, 2017). Despite public encouragement of protection of the forest due to the rare gems inhabiting the Amazon, it has been reported that half of the Amazonian tree species and more than thousand animals are in danger of extinction due to deforestation (Milliken, 2015; IUCN, 2018). Further studies have also predicted that for every 160 sq. kilometres forest land being cleared in the Brazilian Amazon, at least 15 mammal, 30 bird, and 10 amphibian species are expected to become extinct locally by 2050 (Sample, 2012).

Deforestation of the Amazon rainforest started during the 1960s, when the current military dictatorship urged people to establish farms and settle in one of the nine states inhabiting the forest (The Economist, 2005). During the military dictatorship, which lasted until 1985, large sums were spent building highways to open the forest, mainly due to the economic opportunities that were believed to take place there (The Economist, 2005; Ometto, Aguiar, & Martinelli, 2014). The idea did not go as predicted, as the extreme deforestation rate which took place in Amazons during these years have caused regional situations that are economically, socially, environmentally, and politically vulnerable (Oxfam International, 2018). For example, between 2014 and 2015, the main source of water supply in São Paulo went to a record low, due to a decrease in the usual amount of rainfall, causing the worst drought in 80 years and several economic consequences for Brazil's financial centre (Pasolini, 2015). The water crisis was primarily linked to deforestation, as deforestation

disrupts the eco-system of Amazons, causing the vapor clouds that bring rain to the central and south areas of the country to not come as previously expected (Pasolini, 2015). Much of the economy in Brazil is paced on the time of the rainfall and with the trees gone, so is the rain, causing dire straits in the region which produces 30 per cent of Brazil's wealth (Pasolini, 2015). There are several devastating events from the last decade in Brazil which can be linked to the consequences of climate change, such as mudslides and flooding. In 2011, one of the worst-ever natural disasters in Brazil caused more than 1,000 people to lose their lives and 8,000 homes to be destroyed in mudslides near Rio de Janeiro (Ludeña & Netto, 2011). In addition, in 2010 flooding affected more than 1,000 townships, with 470 people killed and 12,000 people losing their houses as a result, and currently more than eight hundred areas have been identified as risk areas for similar events to occur in the future (Ludeña & Netto, 2011).

1.2 Deforestation causing Climate Change

On a global scale, deforestation is one of the leading causes of climate change, because with the forest gone, CO₂ is no longer transformed through photosynthesis, causing a significant increase of the amount of GHG in the atmosphere (WWF, 2018). For the UN, it is essential that the Brazilian Government commits to working towards accomplishing the targets set out in the SDG13, as Brazil is one of the largest emitters of GHGs in the world (La Rovere, 2007). In Brazil, deforestation and land use are the main culprits of the GHG emissions, accounting for more than 74 per cent of the country's emissions (Maisonave, 2017). Furthermore, the Amazon Rainforest produces more than 20 per cent of the world's oxygen and is recognized as a repository of ecological services for the whole world (WWF, 2018). Therefore, if the deforestation in Brazil does not decrease, less CO₂ will be transformed through photosynthesis, causing less emissions to be consumed, and consequently, causing less oxygen to be produced from the Amazon. Moreover, the National Aeronautics and Space Administration (NASA) has observed an increase of GHG in the atmosphere which is blocking the heat from radiating back toward space and has reported that with a high concentration of GHGs the mean global temperature will continue to increase (IPPC, 2014). Projections based on climate models and proxies suggest that if the global mean temperature will increase more than three degrees Celsius, it will cause more frequent and intense heat waves, previously fertile areas may become unarable, and the sea level can increase more than seven meters – causing catastrophic flooding of cities such as Rio de Janeiro in Brazil, Shanghai in China, and The Hague in the Netherlands (Holder, Kommenda, & Watts, 2017).

2. Methodology

There were several instruments available for measuring the main objective of this thesis, and to integrate the different components of the study in a coherent and logical way, both qualitative and quantitative methods were used. In order to get an overview of the topic, the method for background research was desk research, where several search engines and libraries were consulted. The first chapter presents the UN framework on the SDG13 and its sub-targets to illustrate a baseline for further evaluation. One of the most well-known tools for assessing the framework of the SDGs is the UN online database, where all reports regarding the SDGs, published both by the UN and impartial actors, can be found. Moreover, using the UN online database was one of the more practical ways of creating a framework on the SDG13, since one can find specific information regarding the SDG13, which speaks of precise criteria on deforestation and GHG emissions. Secondly, policies regarding forest conservation, climate change, deforestation, and GHG emissions was examined. The official governmental page for Brazilian laws and the Climate Policy Database was selected for this examination due to their reliability and validity. However, there were certain drawbacks associated with the use of these sources, as they present all the policies on the topic of deforestation and do not differentiate the laws based on their efficiency. Moreover, due to practical constraint, this thesis could not provide a comprehensive overview of all forest conservation and climate change policies, agreements, and co-operations implemented in Brazil. Therefore, external sources, such as journals published by experts in the field of Brazilian politics, was also consulted to allow a narrowing of the amount of policies which were consulted. It was analysed through quantitative data of GHG emissions whether the politics on deforestation in Brazil has contributed to the reduction of climate change. There are several instruments available for measuring the data of GHG emissions, the most prominent being the Climate Action Tracker, the UN online database for the National Inventory Reports, and the Intergovernmental Panel on Climate Change Emission Factor database.

After obtaining a proper overview through desk research, it was necessary to conduct field research to interact with the topic at a greater extent. The success rate of the policies, agreements, and co-operations regarding forest conservation, climate change, deforestation, and GHG emissions was also explored, and to do so, it was necessary to conduct interviews with different experts in the field. The first interviewee was the former Minister of Agriculture in Brazil, Luis Carlos Guedes Pinto, who gave his point of view whether Brazil is close to achieving SDG13 and to what extent. Mr. Pinto was interviewed to allow a deeper insight into the political arena of Brazil and to get an overview of the

organisational structure. Mr. Pinto was chosen as an interviewee because of his expertise in the field of forest conservation and agriculture. The second interviewee was the economist Claudio Fernandes, who works for the philanthropic organisation Gestos based in Brazil. Mr. Fernandes answered the questions through the eyes of an NGO and was interviewed to gain a detailed understanding of how the issues are perceived from someone working outside the government. Mr. Fernandes was asked to participate in this study due to his experience in the field of forest conservation, and many years working together with environmentalists in the Amazon rainforest. However, there were certain problems with the use of interviews, as the interviewees based their answers primarily on their personal opinions. This provided a great insight to the topic, yet to capture the complexities of the phenomenon, it was also important to consult other sources. Therefore, in addition to the interviews, further data collection from other sources, such as the World Wildlife Fund and the Brazilian Development Bank, was required to determine the success rate of Brazil achieving SDG13.

3. Framework of Sustainable Development Goal 13

In order to measure to what extent Brazilian deforestation policies have contributed to achieving SDG13, it is essential to structure a framework on what is expected from the UN in regard to SDG13 and how its success will be measured. Due to practical constraints, this paper cannot provide a comprehensive review of all the expectations from the UN regarding SDG13, as this thesis solely engages with the topic of deforestation. Therefore, the reader should bear in mind that the framework is based on the expectations, goals, and measurement-scales which have been published by the UN regarding deforestation and GHG emissions exclusively. It is beyond the scope of this paper to examine other climate change preventions and situations in Brazil, as deforestation will be the focus since it has been proven to be the most influential in the case of climate change in Brazil

3.1 The UN 2030 Agenda for Sustainable Development and SDG13

The UN 2030 Agenda for Sustainable Development, with its 17 SDGs, came into effect in January 2016, and will for the coming 15 years “aspire to ensure prosperity and well-being for all people, while protecting our planet” (United Nations Development Groups, 2016). Even though the goals were an initiative by the UN and the UN-nations, it is the United Nations Development Programme (UNDP) which has been uniquely placed to help implement the goals (UNDP, 2018). The SDGs will continue to guide the UNDP policy and funding until 2030, and the role of the UNDP is to support governments to integrate the 17 goals into their national development plans and policies (UNDP, 2018). The UN wishes for a sustainable development, to further protect our planet and its people. According to a report published by the UNDP in 2016, tackling climate change through adaption and mitigation has enormous potential to drive sustainable development, and furthermore, help the world society thrive towards a better future. The SDG set out to tackle the issue of climate change is SDG13, which states: *take urgent action to combat climate change and its impacts* (UNDP, 2017). The goal is the most important goal to achieve in terms of the fight against the consequences of climate change, and SDG13 tends to do so through promoting climate-specific actions in adaption, mitigation, and finance that will help prepare countries for the impacts of climate change and support GHG emissions reduction (UNDP, 2017). In addition, the UNDP states that the stand-alone goal on climate change must not be undermined, as failure to act on SDG13 will without doubt limit the progress on the other goals, as the result of not mitigating the consequences of climate change will affect all parts of the 2030 Agenda (UNDP, 2017). Currently, every country in the world can see first-hand the devastating effects of climate change, and as GHG emissions continue to rise, so do

the amount of irreversible consequences which threatens the entire system of the world (Green Commodities Programme, 2018). Due to its urgency, it has been especially important for the UN and the UNDP that governments are supported in the implementation of the goals and targets of SDG13, to ensure that the global community has been appropriately prepared for climate change and the global ambition for the target-emissions to be reached (UNDP, 2017).

3.2 Targets of SDG13

To *take urgent action to combat climate change and its impacts* as stated in SDG13, the UN has laid out several targets. *Figure 1* presents an overview of the five targets which composes SDG13, and by which year the UN expects the target to be reached.

Goal 13: Combat Climate Change		
Take urgent action to combat climate change and its impacts		Target
13.1	Strengthen resilience and adaptive capacity to climate related hazards and natural disasters in all countries	2030
13.2	Integrate climate change measures into national policies, strategies, and planning	2030
13.3	Improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning	2030
13.a	Implement the commitment undertaken by developed country Parties to the UNFCCC to a goal of mobilizing jointly USD100 billion annually by 2020 from all Sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	2020
13.b	Promote mechanisms for raising capacities for effective climate change related planning and management, in LDCs, including focusing on women, youth, local and marginalized communities	2030

Figure 1. Goals and Targets of SDG13 (Micaiah, 2015).

From *figure 1*, it can be seen that the UN has laid down quite comprehensive targets in relation to climate change, such as improving awareness of climate change, strengthen resilience towards hazards, and focusing on including women and the youth (MDG Monitor, 2016). However, the target which stands out on the subject of deforestation and GHG emissions is sub-target 13.2, *integrate climate change measures into national policies, strategies, and planning*. As it is only the government of Brazil which can solely take control of deforestation in the Amazon rainforest and its emissions, the further research will take foundation in sub-target 13.2. The UN constructed sub-target 13.2 due to several countries indicating that the establishment of an integrated strategy was necessary to increase their

ability to adapt to the impacts of climate change (Knowledge Platform, 2016). Furthermore, the UNDP has operationalised a plan which helps nations foster climate resilience and lower GHG emissions in a manner that does not threaten further development of the country (Knowledge Platform, 2016). During the process of establishing the framework laid down by the UN in sub-target 13.2, it became evident that one cannot manage what cannot be measured, and therefore, the UNDP is utilizing a complex measurement system which plays an essential role in the achievement of SDG13 (Knowledge Platform, 2016).

3.3 The Common Approach Measurement System

The common approach measurement system which UNDP is using to facilitate the implementation of the SDGs is called 'MAPS' (Mainstreaming, Acceleration and Policy Support) (United Nations Development Groups, 2016). The UNDP is using MAPS, initially framed by the United Nations Development Group (UNDG), to help nations translate the commitments of the SDGs into action (United Nations Development Groups, 2016). By using the MAPS approach, the UNDP "aims to generate awareness among all relevant actors; help governments land the agenda at national and local levels; and, ultimately, mainstream the agenda into their national plans, strategies and budgets" (UNDP, 2017). Furthermore, Brazil was one of the nations which urged the UNDP to establish an integrated strategy, and in relevance to the issues of deforestation, the service given by the UNDP includes policy and programme support on several areas of climate change mitigation, and in addition, other areas which can be problematic for the Brazilian government to facilitate by themselves (UNDP, 2017). For instance, an essential step for Brazil to successfully reach SDG13 is to decrease the amount GHG emissions that are being released due to deforestation, and to do so the Brazilian government needs to review and strengthen its current policies, plans, and strategies in relation to the Amazon rainforest. Furthermore, for the UNDP to ensure that the committed nations of the SDGs are following procedures towards achieving the agenda, an accountability measure has been put into effect (UNDP, 2017). As shown in figure 2, a part of the MAPS approach is to hold the nations accountable of working towards the SDGs through an established monitoring framework.

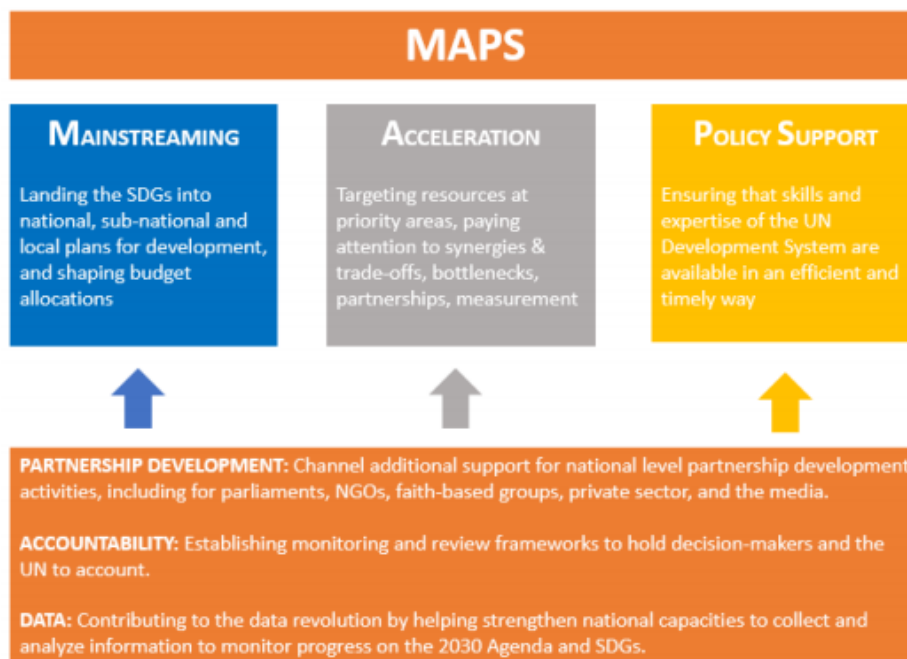


Figure 2. MAPS – The Common Approach (United Nations, 2016).

Furthermore, for Brazil to meet the targets set out in SDG13, the UNDP is providing support to the government “to strengthen individual, institutional and systematic capacities to scale up climate action, pursue zero carbon goals, and build national and local resilience” (UNDP, 2017). Reducing GHG emissions through protecting forests are also an important theme in the targets set out by the UNDP, and Brazil will receive support in the efforts to protect the Amazon rainforest against deforestation while also reducing emissions; for instance, through ongoing support programmes which promote sustainable livelihoods (UNDP, 2017).

3.4 The six Assessment Criteria for Brazil

To measure whether the political efforts on the subject of deforestation carried out by the Brazilian Government have contributed towards achieving the agenda of SDG13, the UNDP has created an assessment scheme to use for evaluation which has been based on the fundamental ideas laid out through MAPS. The UNDP has created several nation-and target specific assessment schemes to properly evaluate the efficiency of progress. In the case of deforestation and GHG emissions in Brazil, the UNDP has created six evaluation criteria (UNDP, 2017).



Figure 3. Assessment Criteria for Brazil regarding deforestation (Dugarova & Nergis, 2017).

The six evaluation criteria created by the UNDP will be used in this thesis as the foundation framework to investigate to what extent Brazilian deforestation policies have contributed to the achievement of SDG13. The table above (figure 3) illustrates the six criteria, consisting of activities which are not mutually exclusive and therefore not meant as a step-by-step plan, but rather an overview of the areas which the Brazilian government must on all occasions consider.

3.4.1 Create an environment for enabling policies to protect the environment

The agenda of the SDGs consist of opting for sustainable development, and to properly do so it is essential that climate change is addressed “through eco-social policies accompanied by a normative and policy shift towards greater consideration of ecological and social objectives in development strategies” (UNRISD, 2016). In other words, to promote sustainable development, it is essential that policymakers provide an enabling environment for social innovation that aims for protecting the environment, and this can only be done in Brazil if the government makes a public understanding of the importance of decreasing deforestation and GHG emissions (Dugarova & Nergis, 2017). This requires an awareness of the evidence on the causes of climate change, an informed discussion on the cost and benefits of different course of action, and indeed, action (Dugarova & Nergis, 2017).

3.4.2 Ensure that deforestation policies are being adhered at a regional level

The UNDP has stated that it has become apparent that there is an issue of coherence at different levels of decision-making and implementation, and in order to reduce deforestation and decrease GHG emissions it is required that regional governance is improved (Dugarova & Nergis, 2017). For instance, improving national laws on deforestation in Brazil will not improve the situation if the law is not being properly implemented and monitored by the regional government. This requires constant cooperation between the national government in Brasilia and the federal states which the Amazon rainforest is located in.

3.4.3 Government must raise public awareness on the issue of climate change

The issue of deforestation and GHG emissions is not just an issue which must be discussed by the government, but it is also essential that the Brazilian Government raises public awareness on the situation. According to the UNDP, the government should raise public awareness through several measures; for instance, engage with the media to feature TV shows, radio interviews, and articles about the SDGs, and provide training to journalists on the SDGs to ensure objective reporting; appoint eminent individuals and celebrities as SDGs ambassadors; conduct SDG training for government officials to strengthen the knowledge of public servants; use social media to hold regular question-and-answer sessions between the government and the public; produce and distribute SDG-related materials in national and local languages for different age groups (Dugarova & Nergis, 2017).

3.4.4 Government must include civil society in the development and implementation of policies

Central to the quality of implementing the 2030 Agenda is the application of multi-stakeholder approaches to develop and implement policies, it is therefore important that the Brazilian Government encourages and facilitates partnerships between the government and civil society (Dugarova & Nergis, 2017). The government must therefore include different civil society groups in the development and implementation of policies, groups such as universities, think tanks, private sector, and other development actors, to create a system of cooperation.

3.4.5 Government must review and strengthen existing deforestation policies

The Brazilian Government must re-examine and analyse the current plans put in place to decrease deforestation and GHG emissions. Together with the regional officials, civil society, and other actors, the Brazilian Government must implement measures to

strengthen the current politics on climate change to make further improvements and to adapt the SDGs to the national context (Dugarova & Nergis, 2017). According to the UNDP, this can be done by prioritizing the SDGs and its targets, by setting new national targets and indicators, and by adapting national and subnational development plans and strategies which align with the SDGs (Dugarova & Nergis, 2017).

3.4.6 Government must monitor deforestation, GHG emissions, and take accountability

To enable well-informed decision-making and to monitor development progress, it is important that the Brazilian Government provides timely, relevant, and high-quality information regarding the efforts of decreasing deforestation and reducing GHG emissions (Dugarova & Nergis, 2017). In addition, it is essential that the government makes the data available to the public and is transparent regarding the work conducted (Dugarova & Nergis, 2017). This can be done through, for instance, increasing funding in statistical systems, and creating systems of data-collection and registration (Statistics Netherlands, 2017). In addition, by developing effective, accountable and transparent institutions on all levels (Statistics Netherlands, 2017). The SDG13 also covers the commitments which Brazil has made in the context of the Paris Agreement, and to fight climate change Brazil must act to decrease GHG emissions, therefore, the Brazilian Government must prove the country's intent to reduce GHG emissions by 37 per cent compared to 2005 levels by 2025 (Mattos & Santos, 2017). Lastly, it is also important that, if the current politics on climate change are insufficient towards achieving SDG13, the Brazilian Government takes accountability and proves efforts to changing the path of direction (Dugarova & Nergis, 2017).

4. Brazilian Climate Change Politics and its Effects

According to the Brazilian delegation of the World Wide Fund for Nature (WWF), the major regulatory frameworks on forest conservation and GHG emissions of the Amazon rainforest all took place after the 2000s, apart from the initial conservation policy in 1965 (WWF-Brasil, 2017). Therefore, most of the politics on the issues which will be presented, predominantly took place after the 2000s. This study is unable to encompass the entire legal history on environmental conservation in Brazil, therefore, the reader should bear in mind that only the laws, agreements, and policies which have stood out on the topic of deforestation and GHG emissions in Brazil will be presented. To reach the main objective of this thesis, which is to evaluate to what extent Brazilian deforestation policies have contributed to the achievement of SDG13, which came into effect in 2016, it is essential to present and discuss the most prominent policies on climate change taken place in Brazil throughout the last decades, also the ones implemented before the time of the SDGs.

In this chapter, the Brazilian politics on climate change, from the initial forest conservation law in 1965 to the most recent policy changes, will be presented together with the recorded effects of the policies. The recorded effects are based on the monitoring mechanisms of deforestation, GHG emission rates, and political outcomes published by the Brazilian Government and several statistical bureaus. The policies will be presented in the order of year they were implemented. It is essential to present both the legal text of the policy and its subsequent effect, to create a clear structure in the time-line of climate change laws in Brazil. The laws discussed in this chapter have been chosen due to their prominent impact on the history of deforestation, GHG emissions, and forest conservation in Brazil, as discussed by the WWF, the UN, and the UNDP (WWF-Brasil, 2017; Gonçalves, 2009). *Figure 4*, on the following page provides an overview of a timeline of the eight periods which have stood out, and the matters which will be presented and described throughout this chapter.

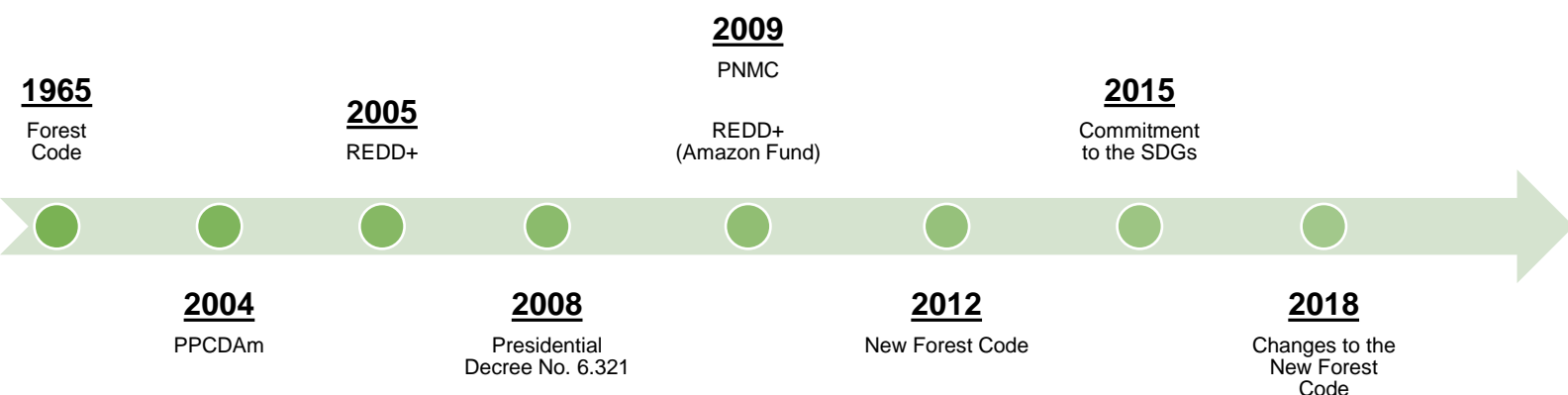


Figure 4. Timeline of the major politics on deforestation and GHG emissions in Brazil.

4.1 - 1965 – Forest Code

The basis of Brazil's forest protection is the Forest Code, Law No. 4.771, which was enacted in 1965 (Tersitsch, 2017). The law was implemented to regulate how much of the land could be used for farming, and it required landowners in the Amazon rainforest to maintain 35 to 80 per cent of their property under native vegetation, meaning that they could only farm 20 per cent of it (The Nature Conservancy, 2018; Tersitsch, 2017). The legal text of the Forest Code acknowledged the importance of conservation and for setting parameters on environmental preservation (Poço, 2011). Figure 5 presents the summary of the two instruments of greatest relevance which were established in the Forest Code; the legal reserve and the permanent preservation areas.

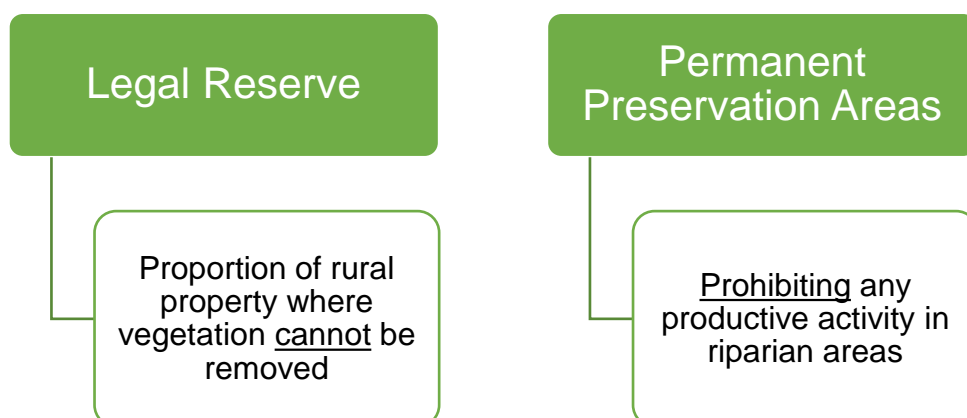


Figure 5. The two instruments of the 1965 Forest Code (Poço, 2011).

The first instrument, the legal reserve, was established to identify what proportion of each rural property where vegetation could not be removed, and what areas could be used for

farming (Poço, 2011). The second instrument, regarding the permanent preservation areas, had the goal of protecting important water resources, and therefore, prohibited farming activities in riparian areas (Poço, 2011). Furthermore, when an area had been established as a permanent preservation area, it was required by the landowner to preserve its biodiversity and leave it covered by natural vegetation (Poço, 2011). After the implementation of the Forest Code, there were no initial effects in the following decades, as it underwent several reforms, and only became de facto law in 2001 (Tersitsch, 2017).

4.2 - 2004 – Policy Turning Points

The decades following the implementation of the Forest Code was filled with several reforms and debates regarding forest protection, as at the time of its implementation, only 10 per cent of the private land in the Amazon rainforest was recorded under clear ownership (The Nature Conservancy, 2018). According to the Minister of Agriculture in Brazil from 2006 to 2007, Luis Carlos Guedes Pinto, the years following the creation of the Forest Code in 1965, were filled with several arguments regarding who oversaw implementation and monitoring of deforestation, and the Forest Code had little-to-no effect after its implementation (L. Pinto, personal communication, April 10, 2018). The Ministry of Agriculture oversaw implementing and monitoring the Forest Code and had to increase agricultural production in the Amazon region, two aspects which caused a conflict of interest within the ministry (L. Pinto, personal communication, April 10, 2018). Due to the conflict of interest, the Brazilian Government created the Ministry of Environment in 1992, whom then received the sole responsibility of overseeing the deforestation laws (MMA, 2018). Despite the creation of the Ministry of Environment in 1992, the enforcement of the Forest Code was limited until the mid-2000s due to the lack of appropriate monitoring tools, insufficient funding, and low political support (Tersitsch, 2017). Moreover, as shown in *figure 6* on the following page, there were several peaks of deforestation following the Forest Code Law, and in 2004 it was at one of its highest rates recorded, with approximately 18 per cent of the Amazon rainforest deforested (Cordeiro, Galerani, Sá, Freitas , & Dossa, n.d.).

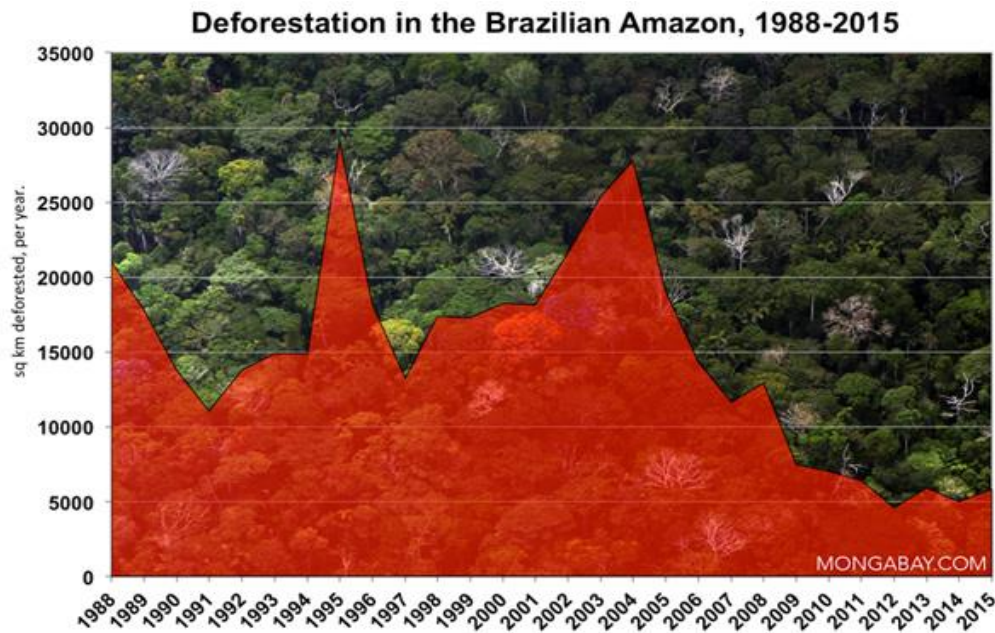


Figure 6. Deforestation in the Brazilian Amazon (Mongabay, 2018).

In the mid-2000s, Brazilian conservation policies for the control and deforestation in the Amazon underwent significant revisions, with 2004 being the year standing out as the first key turning point within the country's policy landscape (Assunção, Gandour, & Rocha, 2015). The turning point of the country's conservation policies began taking place after the elections in 2003, when the political governance of Brazil shifted. In 2003, the presidency went from the Brazilian Social Democracy Party (PSDB) to the Worker's Party (PT). The newly elected president, Lula, and his administration had set out to bring together industrial elites, workers and civil society representatives around a national development agenda and was favoured by many environmentalists due to the administration's promising environmental conservation view (Nunes, 2015). Lula appointed Marina Silva, an environmentalist from the Amazonian state of Acre, as Minister of Environment, and several experts have said that her efforts in the ministry led to the first major turning point in Brazilian conservation policies (Nunes, 2015).

4.3 - 2004 – PPCDAm

The year of 2004 marked a turning point in the Brazilian conservation policies with the launch of the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) (Assunção, Gandour, & Rocha, 2015). As a part of a collaborative effort between federal, state, and municipal governments, in co-operation with specialised organisations and civil society groups, conservation efforts were based of strategic measures which introduced a new form of dealing with deforestation in the Amazon

rainforest (Assunção, Gandour, & Rocha, 2015). The PPCDAm brought together 13 ministries and related agencies, such as the National Institute of Spatial Research (INPE), the Federal Police, the Federal Highway Police, the Brazilian Army, and the Chief of Staff, whom together worked on an integrated approach to facilitate the implementation of innovative procedures for monitoring, environmental control, and territorial management (Cordeiro, Galerani, Sá, Freitas , & Dossa, n.d.; Assunção, Gandour, & Rocha, 2015). The aims of the activities under the PPCDAm were to strengthen control of deforestation; clarify tenure through registers; strengthen monitoring capacities; incentivize sustainable practices; support sustainable forest management; enhance agricultural activities; and restore degraded areas (Climate Policy Database, 2004). As can be seen from *figure 7*, the activities and targets under the PPCDAm were organised into three major sections under each part.

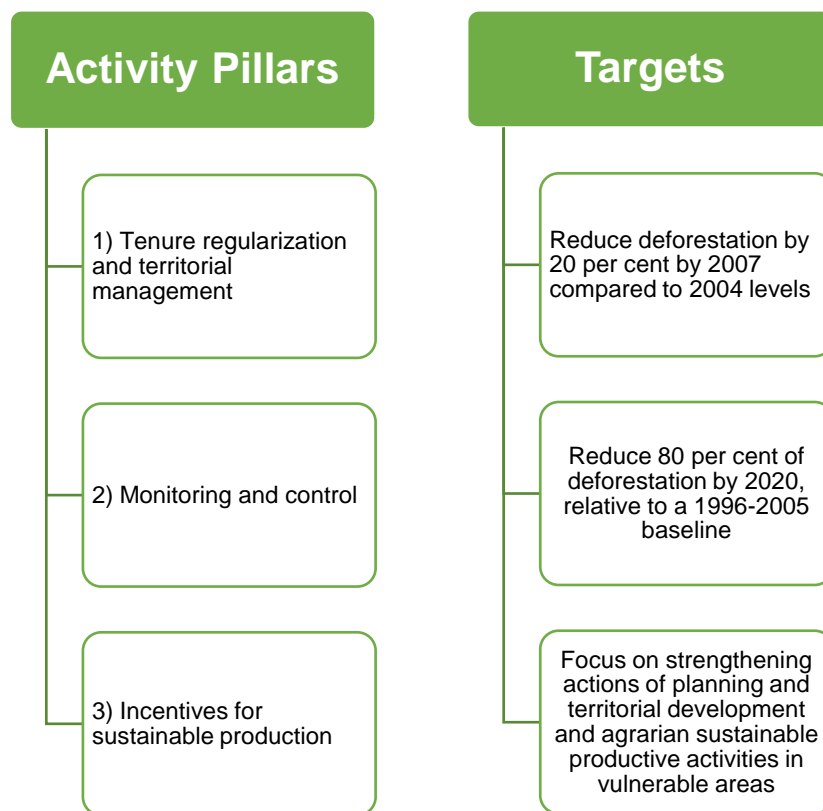


Figure 7. Activities and Targets of the PPCDAm (Climate Policy Database, 2004).

4.3.1 Effects of the PPCDAm

After the implementation of the PPCDAm in 2004, there were three major effects that took place. The first initial effect of the PPCDAm was a strengthening of the monitoring and implementation mechanisms. Mutual cooperation at all levels provided support for stricter monitoring activities, and following implementation of the PPCDAm, several measures were taken, such as; remote sensing-based forest monitoring capacity improved with the implementation of INPE's Real-Time system for Detection of Deforestation; the INPE and the Brazilian Institute for the Environment and Renewable Natural Resources (Ibama) began collaborating on the regular production and distribution of georeferenced digital maps containing information on recent changes to the forest; Ibama launched a programme to improve the qualification of its environmental personnel; in addition, the government expanded the areas of conservation units and recognized more indigenous land (Assunção, Gandour, & Rocha, 2015).

Secondly, the PPCDAm initiated extraordinary development of systems to monitor deforestation in the Amazon. Following its implementation, four systems were developed in an integrated manner and put into place to monitor forest cover status, which allowed the public authorities to monitor the spatial dynamics of deforestation (Gonçalves, 2009). These systems were quite innovative for their time and the systems were internationally renowned for their efficiency to report, provide measurable data, and issue regular warnings to the agencies in charge of enforcement operations on the ground (Gonçalves, 2009).

Thirdly, as a part of the strengthening monitoring capacities activity, 851 enforcement operations were carried out following the implementation of the PPCDAm (Gonçalves, 2009). In the Amazon rainforest, there were many illegal activities, such as illegal logging and agricultural production, which led to deforestation, and the enforcement operations were initiated to gain control over land areas which the government has previously not overseen. These operations resulted in seizure of large volumes of illegal cut timber, and the arrest of more than 600 people, including governmental officials (Gonçalves, 2009).

4.4 - 2005 – REDD+ and Initial Effects

In 2005, several developing countries proposed an international strategy for Reducing GHG Emissions from Deforestation and forest Degradation, known as REDD+ in cooperation with the UNDP. The idea was that countries which were the home of the world's rainforests would reduce deforestation in return for compensation by wealthy nations for any resulting economic losses (Boucher, 2011). This strategy was unlike earlier "offset" funding, where

nations would pay for emissions reduction in tropical countries, and, in exchange, could emit more in their own countries, as with REDD+ there would be no corresponding increase in the supporting nation's emissions because of their commitments to the tropical countries (Boucher, 2011). Furthermore, REDD+ became a key component in the further climate change negotiations in the Brazilian government, and environmentalists saw it as an opportunity to strengthen forest governance, protect biodiversity, and improve the quality of life of rural populations in the Amazon areas (ICV, 2013). The REDD+ Agreement spiked several debates regarding deforestation and GHG emission targets within the federal government of Brazil, but the government agreed to initially use the targets set in the PPCDAm as foundation for the REDD+ target achievements (Gonçalves, 2009). Under the REDD+ agreement, the government implemented Law No. 11. 132 which allowed the federal government to establish 'areas of provisional administrative limitations' in deforested areas to take shift the jurisdiction towards a federal level (May, Millikan, & Gebara, 2011). As the data of deforestation and GHG emissions coming from deforestation are not published in real-time, the effects of the REDD+ policy was not measurable before years after its implementation. The data to analyse the effects of REDD+ were not published before 2009 and will therefore be discussed later in this chapter.

4.5 - 2008 – Presidential Decree No. 6.321

In 2007, the current President of Brazil, Lula, signed the Presidential Decree No. 6.321 on deforestation (Climate Policy Database, 2008). The objective of the policy was to establish procedures to intensify efforts in combating deforestation in municipalities identified as the worst of forest clearing, and the policy allowed a revision of private land titles (to examine and identify fraudulent documents and illegal occupations), and restriction on access to rural properties (Climate Policy Database, 2008). The signing of the Presidential Decree took place in 2007, but the policy did not come into effect before 2008, when the Ministry of Environment published a list of thirty-six municipalities which were classified as in need of priority action to prevent, monitor, and combat illegal deforestation (Assunção, Gandour, & Rocha, 2015). These municipalities accounted for more than 55 per cent of the deforestation rate, and the law was implemented to serve a greater focus on the municipalities (Gonçalves, 2009). One of the main strategies adopted through the law was to focus command and control actions and initiatives that promoted sustainable productive activities in the municipalities (Gonçalves, 2009).

4.5.1 Effects of the Presidential Decree No. 6.321

The passing of the policy additionally re-established directives regarding the federal administrative processes for the investigation of environmental infractions – to bring greater regulatory stability to the administrative processes of penalizing environmental crimes (Assunção, Gandour, & Rocha, 2015). In addition, the policy, together with the PPCDAm implemented in 2004, contributed to the curbing of deforestation (Assunção, Gandour, & Rocha, 2015). As shown in *figure 8*, the adoption of these policies coincides with sharp subsequent decrease in deforestation rate.

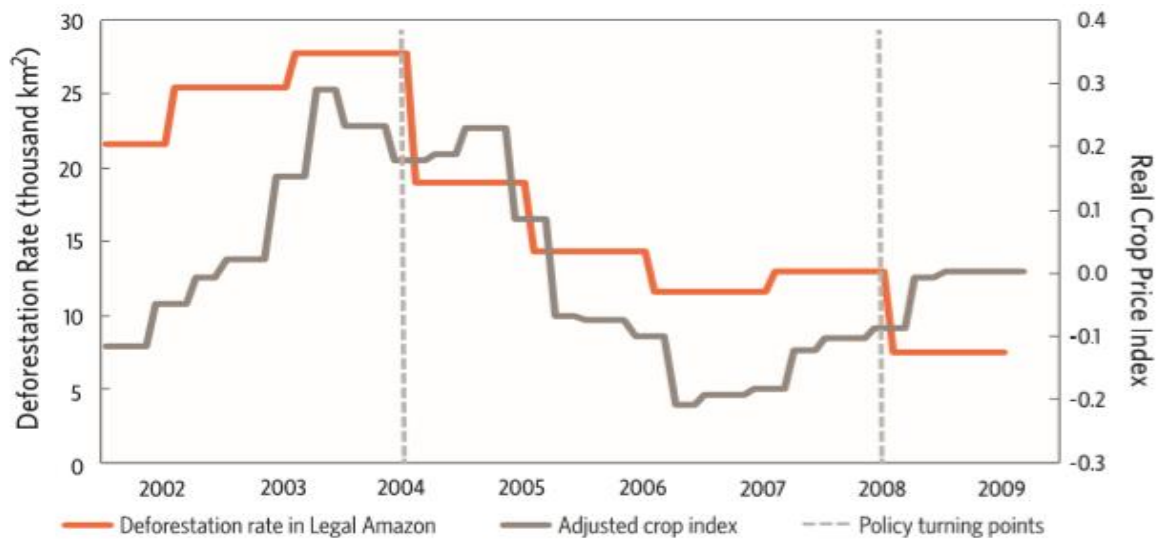


Figure 8. Deforestation rate in Amazon (Assunção, Gandour, & Rocha, 2015).

These policies have, according to calculations by the Climate Policy Initiative, helped avoid an estimated 73,000 sq. kilometres of forest clearings between 2004 and 2009, equivalent to approximately 2.7 million tons of stored CO₂ (Assunção, Gandour, & Rocha, 2015). *Figure 9* illustrates how these two policies have played an important role in containing forests clearings, as it is believed that deforestation would have peaked in 2005 had it not been for the implementation of the PPCDAm in 2004 (Assunção, Gandour, & Rocha, 2015). In addition, due to the implementation of the Presidential Decree. No. 6.321 in 2008, the deforestation in the thirty-six municipalities which accounted for the most deforestation, dropped by 65 per cent between 2008 and 2009 (Gonçalves, 2009).

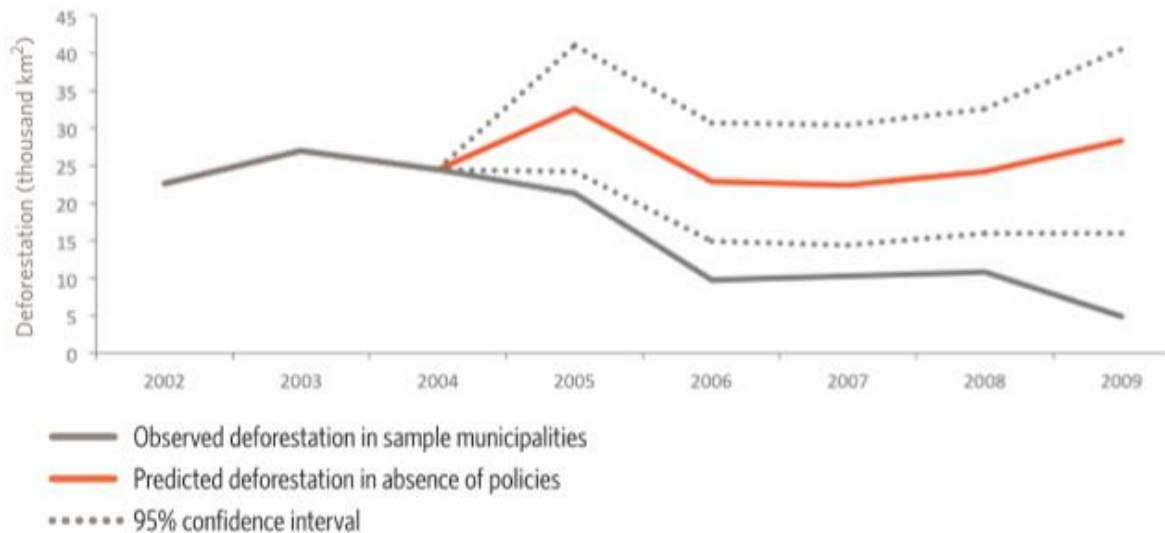


Figure 9. What would have happened in the absence of policies? (Assunção, Gandour, & Rocha, 2015)

4.6 - 2009 – PNMC

In 2009, Brazil adopted Law No. 12. 187, which established the National Policy of Climate Change (PNMC); a measure to pursue the voluntary actions for the mitigation of GHG emissions which the government of Brazil had pledged following the UN Climate Change Conference in Copenhagen in 2009 (Ludeña & Netto, 2011; WRI, 2018). During the conference, Brazil restated its deforestation reduction target for 2020 from the PPCDAm and undertook a vow to, in addition, voluntarily reduce its GHG emissions by 36.1-38.9 per cent by 2020 (Ludeña & Netto, 2011). The PNMC was the law which legally confirmed the voluntary reduction targets for GHG emissions for Brazil, and the law which has been said to be one of the most ambitious policies to reduce deforestation, following the PPCDAm (WRI, 2018). The target ambitions of the PNMC were including, but not limited to; 80 per cent reduction in deforestation in the Amazon; restoration of grazing land; change in agricultural practices (Ludeña & Netto, 2011). The new law required Brazil to quantify and verify its mitigation actions, meaning that international organisations, such as the UNDP, would be able to review and confirm whether the reduction of GHG emissions have taken place (Robinson, 2010). In addition, since the PNMC attaches great importance to reducing its GHG emissions, the Brazilian Government proposed an overall target five-year reduction of 42 per cent (Gonçalves, 2009). *Figure 10* breaks down the targets for reducing deforestation proposed in the PNMC following its implementation in 2009. The baseline for the calculation of the 80 per cent reduction, as proposed in the PNMC, was the official

average deforestation rate between 1996 and 2005, i.e., 19.6 thousand sq. kilometres (Gonçalves, 2009).

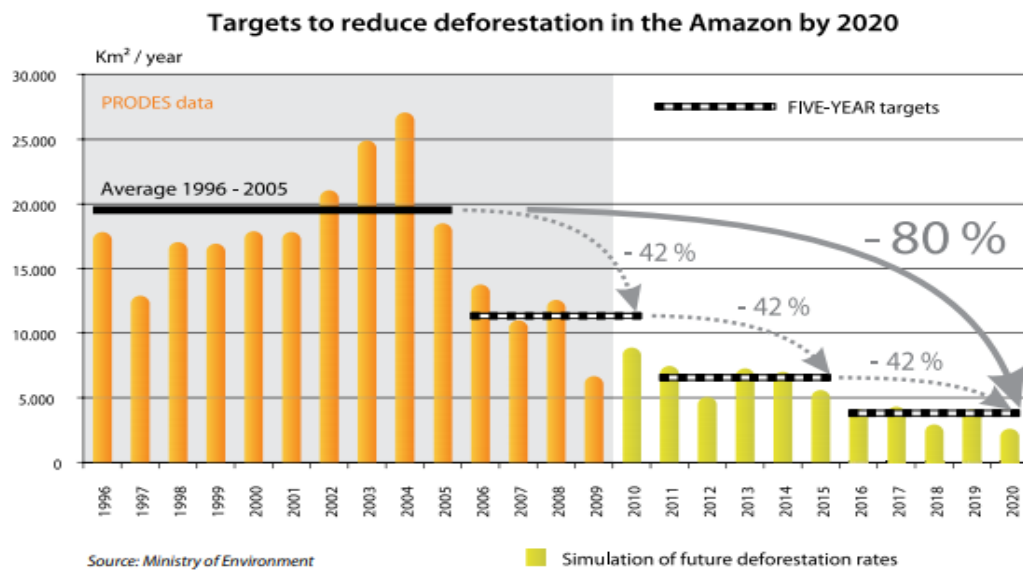


Figure 10. Deforestation targets in the Brazilian Amazon (Gonçalves, 2009).

4.6.1 Effects of the PNMC

The PNMC was one of the most progressive policies implemented thus far in Brazil regarding the reduction of GHG emissions. At the time of its implementation, Brazil's emissions were already well below previous recorded rates, mostly due to a steep fall in deforestation (Timperley, 2018). According to data calculated by the Potsdam Institute for Climate Impact Research (PIK), Brazil's emissions had fallen to 1.4 billion tons CO₂ equivalent by 2010, correspondent to a 32 per cent drop on 2005 levels (Timperley, 2018). However, an important aspect to consider when assessing the effect of this law, is that during the implementation period, lobbyists from the Ministry of Mines and Energy influenced President Lula to abandon the calling for a gradual abandonment of the use of fossil fuels (Guerreiro, 2009). Moreover, despite deforestation accounting for most of the GHG emissions in Brazil, the usage of fossil fuels account for 17 per cent, and the international community were therefore sceptical to the veto from Lula, as it could result in the overall emissions to not decrease (La Rovere & Pereira, 2007). This is an important aspect, as the goal of the agreement in Copenhagen was to reduce the overall rate of emissions. Moreover, despite the ambitious expectations, the emissions in relation to usage of fossil fuels increased, thus counterproductive in the work towards decreasing the GHG emissions related to deforestation (Climate Action Tracker, 2018). As illustrated in figure 11, the overall emissions from Brazil has continued to increase, despite the dramatic decline

in GHG emissions from deforestation, thus the PNMC having little to no effect regarding the overall reduction of GHG emissions (Climate Action Tracker, 2018). However, the status is that Brazil will just meet the targets, unless the GHG emissions from the energy sector and illegal deforestation continues to increase (Climate Action Tracker, 2018). The latest report published by Climate Action Tracker shows that Brazil has reduced 36 per cent of GHG emissions compared to 2005 levels (Climate Action Tracker, 2018).

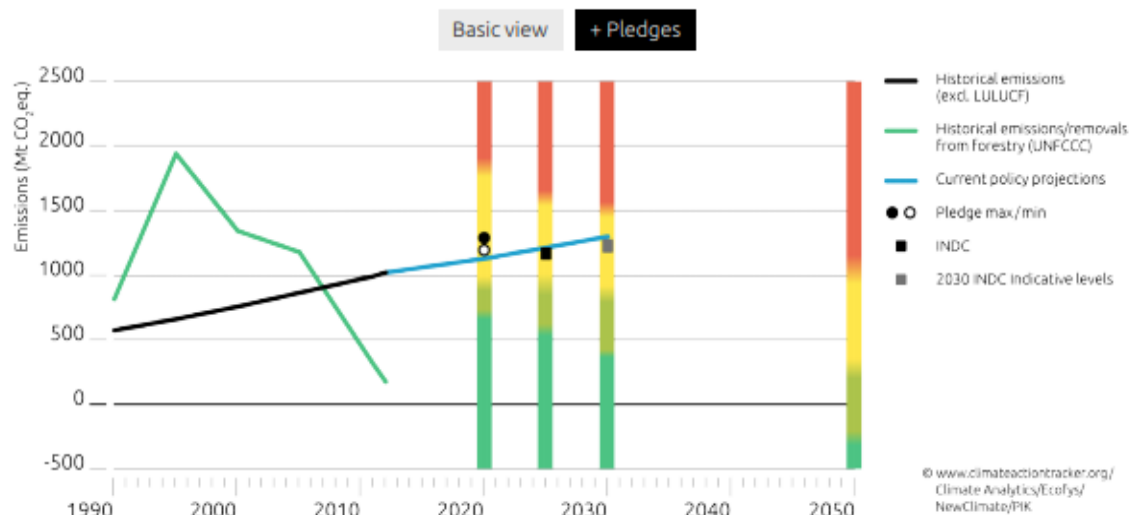


Figure 11. Overall emissions in Brazil (Climate Action Tracker, 2018).

4.7 - 2009 – REDD+ Effects. (Amazon Fund)

Between 2005-2009, the Brazilian government had worked out several measures for implementing the agreement stated in REDD+. In 2005, one of the strongest supporters of the REDD+ concept was the Norwegian Government, which pledged \$2.5 billion for the effort (Boucher, 2011). The REDD+ agreement was results-based, and therefore, the Brazilian Government had to create different mechanisms to ensure impartial data collection and management. The Amazon Fund was therefore created as a financial mechanism, to manage the investments for prevention and reduction of deforestation (Ludeña & Netto, 2011). The Amazon Fund worked as a support mechanism to the Ministry of Environment to produce unbiased mapping of climate change vulnerability in the Amazon region, data on deforestation, and analysis of GHG emissions (Ludeña & Netto, 2011). The aim of the fund was to “use national and international donations to finance initiatives that complement national efforts to reduce deforestation in the Amazon” (Gonçalves, 2009). Furthermore, the steering committee of the fund, composed of experts with technical and scientific knowledge, were responsible for defining guidelines and criteria for allocation, and demonstrate the effective reduction of GHG emissions from deforestation (Gonçalves,

2009). In 2009, the Ministry of Environment in Brazil published data showing that Brazil's area of deforestation, which averaged 19,000 sq. kilometres per year during the baseline decade of 1996-2005, had dropped 67 per cent, to just 6,500 sq. kilometres (Boucher, 2011). The data was used to convert deforested area to GHG emissions, showing that Brazil had reduced their emissions coming from deforestation by nearly 1 billion tons (Boucher, 2011). The Norwegian government had through REDD+ committed \$1 billion to compensate Brazil for its reduction in emissions, and following the data published in 2009, the first payment of \$110 million were made (Boucher, 2011).

4.8 - 2012 – the New Forest Code

The reviewed version of the 1965 Forest Code was approved May 2012 and came into effect under Law No. 12. 651, known as the Law of Protection of Native Vegetation, or simply, as the New Forest Code (Guidotti, et al., 2017). Under the reviewed law, land holders were required to register their land in a geo-referenced rural environmental cadastre known as the Cadastro Ambiental Rural (CAR), a key mechanism of the New Forest Code put into place to have a better overview of the private land areas in the Amazon (Tersitsch, 2017). Furthermore, only after the landowner had registered their land in the CAR mechanism, they would be able to receive environmental licences and be presented with an exemption from environmental fines (Tersitsch, 2017). The CAR mechanism was one of the major breakthroughs for the Brazilian government in the New Forest Code, as it created 'spatial' liability for landowners and assisted the local state-governments to properly facilitate the monitoring of environmental compliances, such as; monitoring legal and illegal deforestation and monitoring activity on private owned land in the Amazon (Tersitsch, 2017). The creation of a database that registered ownership of land, such as the CAR mechanisms, was highly prioritised by the government, as over 69 per cent of the deforestation in Amazon occurred on properties which were not publicly registered (Azevedo, et al., 2017). Moreover, the implementation of the CAR mechanism required a local overview of geo-referencing and identification of property boundaries, legal reserves, and areas of permanent reserves (Jung, Rasmussen, Watkins, Newton, & Agrawal, 2017). Meaning that landowners had to register their property and use georeferencing to establish property boundaries and present satellite images to show remaining forest (Azevedo, et al., 2017). The New Forest Code included several specific changes in regulations related to the CAR, and the *figure 12* presents the breakdown of the New Forest Code as approved by the senate. After the changes, landowners had to register their property in the CAR system, which was voluntary before 2012. Furthermore, the changes allowed landowners to count all areas of permanent reserves as a part of their legal reserves (Jung, Rasmussen,

Watkins, Newton, & Agrawal, 2017). States with more than 65 per cent of Amazon forest area being protected could reduce the legal reserve to 50 per cent (Jung, Rasmussen, Watkins, Newton, & Agrawal, 2017). In addition, the amount of required forest along rivers decreased from a range between 30 and 500 meters to 5 and 100 meters (Jung, Rasmussen, Watkins, Newton, & Agrawal, 2017). Moreover, another key change in the New Forest Code was the change of implementation and monitoring governance. Alternatively, instead of the Ministry of Environment monitoring the activities, the forest management and enforcement of environmental laws became decentralised, meaning that the proper implementation of the law fell in the hands of the local administrations (Tersitsch, 2017).

Seeing the wood for the trees			
Brazil's forest code, selected provisions			
	Current law	As approved by Congress	As promulgated by the president
Specially protected areas	Riverbanks protected to 30-500 metres depending on the river's width. Other biodiverse or erosion-prone areas also protected	Most special protections reduced; some removed entirely	Riverbanks still protected, but in narrower strips: 5-100 metres. Mangrove swamps protected, but activities such as shrimp farming allowed around their edges
Compulsory forest reserve	Amazon: 80% Cerrado (savannah): 35% Everywhere else: 20% Specially protected areas cannot count towards the total percentage	Specially protected areas count towards the total. Amazonian states with little overall deforestation can cut the reserve to 50%. Smallholders exempt from reforestation areas cleared before June 2008	Specially protected areas count towards the total. Small farmers who deforested illegally, in whatever region, need only reforest 20% of their land. Others must comply in full
Amnesty	na	All penalties from before June 2008 written off. No new penalties for farmers who sign up for a vague and leisurely compliance process	Only small farmers have any exemption from reforestation. Everyone else can escape fines only by complying
Environmental Registry	na	Landowners must register their properties, but infractions largely penalty-free	Landowners must register and comply with the code within five years or face fines and denial of bank loans

Source: Brazil's Senate

Figure 12. The New Forest Code as Approved by Congress (The Economist, 2012).

4.8.1 Effects of the New Forest Code

The implementation of the New Forest Code has been a priority for the government, and in the process of its implementation, more than 50,000 properties have been registered through the CAR mechanism (WWF-Brasil, 2017). However, following the approval of the New Forest Code, there have been several issues which have arisen from the reviewed law. First, one of the biggest changes which was implemented through the New Forest

Code was the change of governance, as the monitoring of activities, forest management, and enforcement of environmental laws became decentralised. Former Minister of Agriculture in Brazil, Mr. Pinto, expressed concerns with the change of governance as it would cause big implications due to corruption in the regional government (L. Pinto, personal communication, April 10, 2018). In a personal interview conducted with Mr. Pinto, he stated that the law to protect nature is present, however, the issue comes down to how to control law enforcement. He also stated that there are many areas in the Brazilian Amazon with severe conflict because the law is not respected, further saying that there are many cases of corruption, no proper governmental structure to enforce the law, and even several events of uninvestigated deaths of environmentalists in the Amazon. Furthermore, Mr. Pinto also raised his concerns with the CAR mechanism, as it in theory would be a great mechanism, but will, according to him, not function as the government expects it to. The idea of the CAR mechanism was to have landowners register their land to prevent illegal deforestation of conservation areas. However, according to Mr. Pinto, the lack of federal governmental monitoring of regional activities will cause several issues, as the problem of formalizing rights remains incomplete. Mr. Pinto further stated that the biggest issue will be with how to prove that one owns the land, as the only way to prove ownership of a property is through a certificate obtained at the notary's office. According to Mr. Pinto, many municipalities have local corrupt politicians and officials, meaning that those who officiate the certificates at the notary's office are often allowing illegal occupants to register their properties, and thus legalizing illegal ownership of property. Further, Mr. Pinto states, that the issues often lay with the regional governance and the idea of a decentralised governance, as the federal government is not able to properly monitor its municipalities. According to the economist, Claudio Fernandes, who works for the Brazilian NGO Gestos, the issue lays with the conflicting goals of the municipalities in the Amazon and the Federal Government of Brazil (C. Fernandes, personal communication, May 02, 2018). In a personal interview conducted with Mr. Fernandes, he expressed that for the municipalities in the Amazon, the economic development is designed with "growth-at-any-cost-paradigm", which has catastrophic consequences for the rainforest. According to Mr. Fernandes, previous public policies diminished the economic growth of the Amazon states thus causing the populations to illegally deforest to produce products. In addition, according to Mr. Pinto, this attitude of growth-at-any-cost is still evident in the Amazon states, causing corruption, disrupted regional governance, and not complying to the laws set out by the Federal Government of Brazil.

The WWF has also raised several concerns with the New Forest Code and its CAR mechanism, as the government does not make the information registered in the CAR

mechanism public (WWF-Brasil, 2017). The New Forest Code prevents disclosure of the CAR identification data, including cadastral data, geographical location, and whether the deforestation situation is active – making it impossible to monitor both legal and illegal deforestation activities in the Amazon (WWF-Brasil, 2017). The normative instruction of the Ministry of Environment is to make all the processes, including the CAR mechanism, transparent; however, the regional governments do not have the same pressure to release information (WWF-Brasil, 2017). Therefore, the WWF has established an active transparency index, as illustrated in *Figure 13*, and the research has showed the practice of making information available is well below what is necessary. For instance, in the state of Amapá, the regional government has not released any data regarding current deforestation rates, licencing of rural activities, and environmental infractions. Moreover, the overall national average of transparency is only 59 per cent – well below the governmental expectations from the New Forest Code.

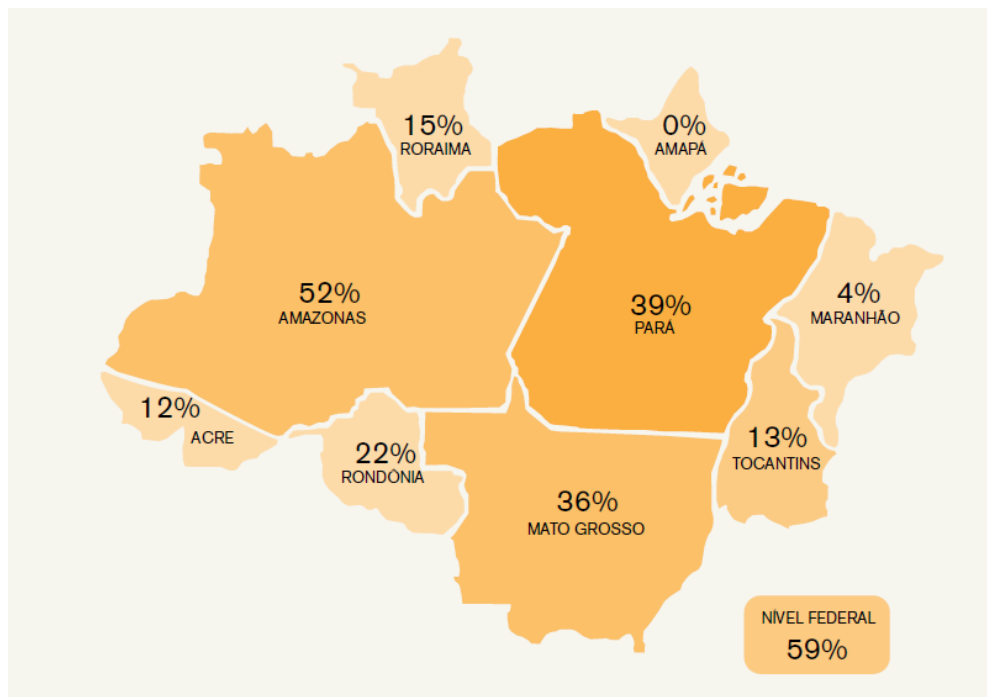


Figure 13. Percentage of transparency in the states occupying the Brazilian Amazon (WWF-Brasil, 2017).

According to the WWF, the second issue with the New Forest Code is that the legal text does not include a distinction between production and conservation. In the law it is written what parts of the forest must be conserved, thus landowners will be notified what areas of their land must be conserved, and the rest of the land can be used for production (WWF-Brasil, 2017). According to the WWF, this has caused severe complications, as many landowners will abuse the power they have over the areas which can be used for

production, through illegal logging or through other activities that may damage the nature (WWF-Brasil, 2017). Mr. Pinto also raised concerns regarding the failure to distinguish between production and conservation, as this will result in many landowners abusing the major loopholes of the law. (L. Pinto, personal communication, April 10, 2018). In addition, most of the products produced in the Amazon “kill the forest”, and according to Mr. Pinto there is little public awareness of environmental conservation, and due to this and the loopholes the problem will continue to escalate.

The third issue which has arisen with the New Forest Code, is the fear that no one will comply with the law. The New Forest Code allows for a pardoning of fines obtained from illegal deforestation before 2008, if you register your land through the CAR mechanism. According to Mr. Fernandes, “this will legally open the [...] gate towards large scale deforestation” (C. Fernandes, personal communication, May 02, 2018). Mr. Fernandes further stated that not only did the New Forest Code give a break to those who deforested before 2008, but it was also not required that they had to recompose any of the native forests which they illegally cut down. Thus, although the New Forest Code guarantees an area of preservation, illegal deforestation will continue to happen as there is no incentive to comply to the law (C. Fernandes, personal communication, May 02, 2018). In the interview with Mr. Pinto, he also raised his concerns with the pardoning of the fines, as this will influence those who illegally deforested in the past to continue (L. Pinto, personal communication, April 10, 2018). The New Forest Code states that one is pardoned from the fines from 2008 and must from then on comply to the law; however, Mr. Pinto believes this will discourage compliance with the law. During the interview with Mr. Pinto, he draws the scenario of someone who has committed several crimes and of a person who has not, yet both were treated equally by the law. According to Mr. Pinto this will cause severe incompletion with the New Forest Code, as those who are criminals will continue as they were easily forgiven for their previous actions, and those who respected the previous law might be influenced to not comply by the new rules. In the interviews with Mr. Pinto and Mr. Fernandes, they both stated that the reviewed version of the Forest Code will indefinitely lead to increased deforestation, as many landowners will use the loopholes of the New Forest Code to continue illegal production. According to them both, the only thing that can help is to centralise the governance again and have the UNDP take charge of further measures.

The fourth issue which has arisen from the New Forest Code, is that there has been recorded a significant increase in deforestation following its approval. According to data from the Amazon Institute of People and the Environment (Imazon), deforestation rates increased from August 2012 until July 2013 by 92 per cent, compared to the previous

period, from August 2011 to July 2012 (Gebara & Thuault, 2013). For example, results have indicated that properties in the Amazon states of Mato Grosso and Pará had lower deforestation immediately after entering the CAR mechanism, however, this effect decreased over time, and disappeared entirely by 2013 (Azevedo, et al., 2017). In addition, in the case of Mato Grosso, deforestation was even recorded to be higher after the implementation of the CAR mechanism (Azevedo, et al., 2017). State agencies have begun to use the CAR data to issue fines, however this requires substantial labour, and due to the lack of resources and personnel, it makes it impossible to prosecute small deforestation events (Azevedo, et al., 2017). Many landowners who registered their properties through the CAR mechanisms were aware of this, and therefore, used this loophole in the New Forest Code to deforest small patches of their property, as they knew it would not be detected or they would not be prosecuted by the control agencies (Azevedo, et al., 2017). Moreover, the concerns arisen by Mr. Pinto and Mr. Fernandes were indeed legitimate, as deforestation rates climbed following the approval of the New Forest Code in 2012.

4.9 2015 – Commitment to the SDGs and its Effects

In the previous chapter, the implementation of the SDGs was discussed, however 2015 marked the year when Brazil committed to the agenda. Prior to the commitment, Brazil had participated in all the intergovernmental negotiation sessions regarding the SDGs, and in September 2015, the Federal Government of Brazil committed to the United Nations General Assembly to achieve the SDGs and their targets (Brazilian Government, 2018). The 2030 Agenda of the SDGs officially came into effect in January 2016, but Brazil had already prior to the official ceremony created several strategies, in cooperation with the UNDP, on how to further apply the SDGs targets into the governmental planning. When a nation officially committed to the 2030 Agenda, there were several measures that had to be implemented, as suggested by the UNDP through the previously discussed MAPS, for the country to fully integrate SDGs strategies into their national planning (United Nations, 2018). For example, when the Brazilian Government agreed to the terms set out in the 2030 agenda, it was obligated to create several impartial agencies and programmes to govern, monitor, and raise public awareness regarding the SDGs (United Nations, 2018). Following the vow to the SDGs, the Brazilian Government, in-cooperation with the UNDP with recommendations from MAPS, created four major elements to implement the 2030 Agenda into the national policy strategies, which would further guide the government (Brazilian Government, 2018).

First, the National Commission for the SDGs was established as an advisory and parity body, aiming to internalise and disseminate the 2030 Agenda implementation process

(United Nations, 2018). The Brazilian Government, with the support from the UNDP, created the commission to provide impartial governance of the 2030 Agenda and to give transparency to the actions being taken to achieve the SDGs in Brazil (UNDP, 2018). The National Commission for the SDGs consists of three levels of government and civil society, and is composed of 16 representatives from Federal, State, District, and Municipal governments, and civil society actors (United Nations, 2018). According to the UN and the UNDP, an essential part of implement the 2030 Agenda, is to include civil society in the decision-making process, thus making it crucial for the Brazilian Government to include civil society actors in the National Commission (UNDP, 2018). Therefore, in addition to the 16 representatives, the National Commission for the SDGs also include: the production sector, the third sector, and the academic community (United Nations, 2018). The production sector consists of 27 State Federations of Industries and 536 companies represented by the National Confederation of Industry (CNI) (United Nations, 2018). Next, the third sector consists of more than 2,000 entities represented by the Brazilian Society for the Advancement of Science (SBPC), the General Workers Union (UGT), and several NGOs (United Nations, 2018). Last, the academic community consists of more than 67 higher education institutions represented by the National Association of Directors of Federal Higher Education Institutions (ANDIFES) (United Nations, 2018). Moreover, in October 2016, the National Commission for the SDGs even received an official governing status as the main institutional mechanism for the implementation of the 2030 Agenda through the Presidential Decree Law. No. 8.892, which gave the commission power to influence policy-making and decisions on a greater scale (UNDP, 2018).

Secondly, the Brazilian Government had to create and establish power to an entity which would properly monitor and report the achievement progress of the Brazilian Government regarding the 2030 Agenda. Therefore, already early in 2015, the Task Force on the 2030 Agenda, was established to facilitate cooperation between the Brazilian Government and UN entities on the issues of the new agenda (United Nations, 2018). The main purpose of the Task Force is to contribute to identifying national, social, economic, and environmental indicators related to the SDGs, monitor the progress being made by the Brazilian Government, and then further report on the status through various publications (UNDG, 2018). The Task Force has published publications following the process of the SDGs targets in Brazil, highlighted data gaps regarding relevant information needed to follow up the SDGs and created a set of glossaries containing key expressions used in the formulation of the SDGs which the Brazilian Government is recommended to use when altering current policies (UNDG, 2018).

Thirdly, through the usage of MAPS, the UNDP has urged the importance of generating awareness of the 2030 Agenda. Moreover, an important aspect of generating awareness is to initiate inclusive participation through raising public awareness and facilitating events. Therefore, the Brazilian Government utilised the UNDP World Centre for Sustainable Development (RIO+ Centre), located in Rio de Janeiro, to arrange dialogues regarding the 2030 Agenda (UNDG, 2018). Starting 2015, there have been several dialogues and conferences organised at the RIO+ Centre, particularly for the Brazilian youth to learn about the SDGs and how to get involved (UNDG, 2018). In addition, universities, civil society actors, and the National Commission, have cooperated to arrange live-events for students from all over the country to learn about the 2030 Agenda (UNDG, 2018). During these conferences and events, people from different corners of Brazil were able to ask questions regarding the 2030 Agenda and suggest how to further implement the SDGs into the Brazilian society. Following these events, several actors and sectors of the National Commission cooperated to create three major instruments to increase inclusive participation (United Nations, 2018). Firstly, the digital participation platform, Dialoga Brasil (Brazil Dialogue), was created to allow citizens to make suggestions, join the debate, and help the government formulate public policies regarding the SDGs targets (United Nations, 2018). Next, a social media instrument called Participa Portal (Participation Portal) was created as a participation tool for citizens, social movements, and organisations, to facilitate a dialogue among governmental bodies dealing with the 2030 Agenda and society through public consultations, debates, and online events (United Nations, 2018). Lastly, the National Commission created a georeferencing platform consisting of data on civil society organisation working on the 2030 Agenda, as well as activities carried out by these organisations, and how an individual can participate in these activities (United Nations, 2018).

Finally, the last major element of the foundation-phase for implementing the 2030 Agenda, was to allow the UNDP to assess current public policies. The Brazilian Government was thus obligated to let the UNDP evaluate the current public policies and agreements regarding climate change, forest conservation, and sustainable development, and assess how far the Brazilian government were towards reaching the targets set out in the SDGs (United Nations, 2018). Through their assessment, the UNDP used MAPS and other criteria, discussed in the previous chapter, to evaluate Brazil. *Figure 14*, on the following page, illustrates the results of the UNDP evaluation of the public policies in Brazil, regarding all the 17 goals in the 2030 Agenda. After conducting the assessment, the UNDP emphasised the importance of the Brazilian Government to further strengthen their public policies in order to reach the targets set out by the SDGs (United Nations, 2018). *Figure 14*

illustrates the progress made on all goals, yet it is important to highlight the current evaluation of progress towards achieving SDG13. According to the UNDP, the public policies of 2015 only brought Brazil up to the 50th percentile of SDG13, thus indicating that the Brazilian Government must alter their public policies additionally to meet the targets and indicators of SDG13 (United Nations, 2018).

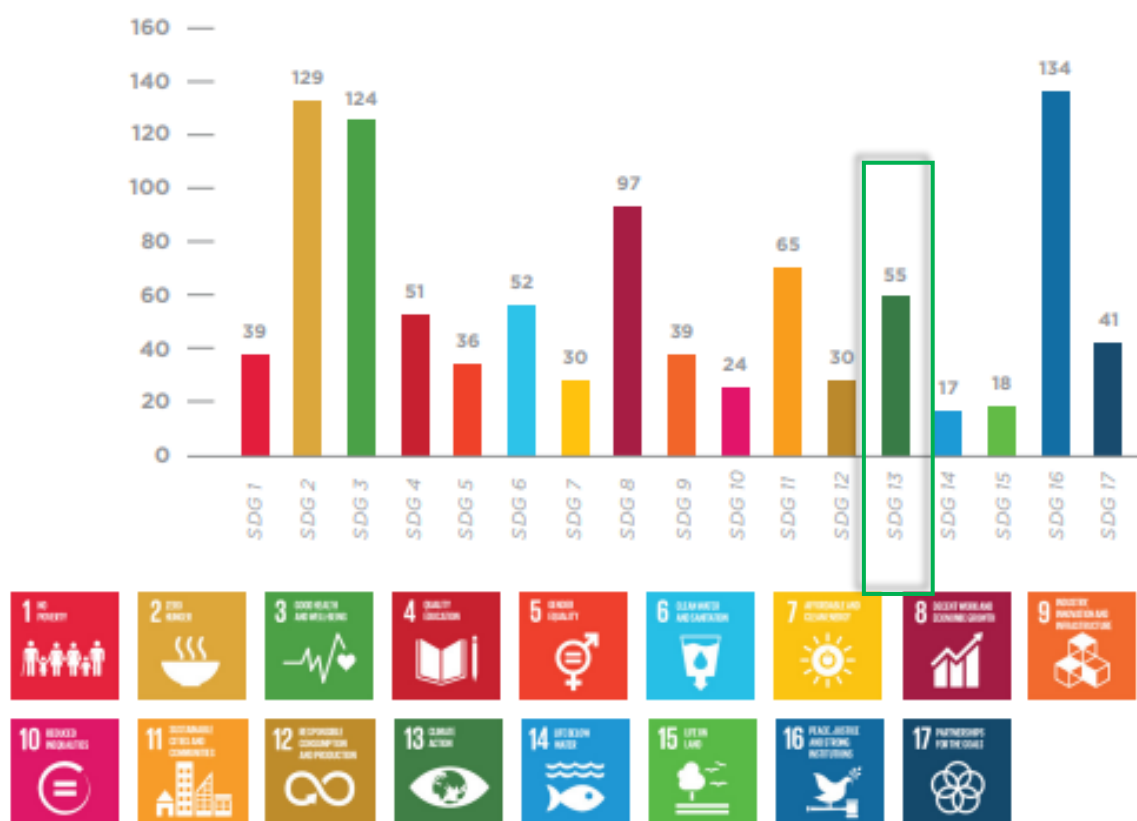


Figure 14. Evaluation of Public Policies in Brazil regarding the 2030 Agenda (SDG13 Highlighted) (United Nations, 2018)

4.10 - 2018 – Changes of the New Forest Code

Starting in 2017, the congress in Brazil began reviewing the New Forest Code which was implemented in 2012, and in February 2018 the Brazilian Supreme Court upheld major changes to the law (Spring, 2018). Following the political turmoil and impeachment of former President Dilma Rousseff in December 2015, the 'rulista' bloc in the National Congress of Brazil urged for a revision of the New Forest Code which was drafted and implemented during the presidency of Dilma (Schiffman, 2017). The 'rulista' bloc represents the interests of agribusinesses and large landholders, and the revision was based in an aspiration that an emendation will help grow the economy (Schiffman, 2017; Watts, 2017).

The Brazilian Government has stated that to emerge Brazil from its deepest recession in decades, the changes to the law are necessary to attract foreign investment, improve exports, and boost the economy (Watts, 2017). The changes to the New Forest Code included: reducing deforested land that had to be restored under previous rules by 290,000 sq. kilometres; major cuts in funds for forest conservation; reducing the size of conservation areas in the Amazon by more than 10,000 sq. kilometres (Spring, 2018; Arsenault, 2017). Moreover, under the review law, landowners “will be able to cultivate land closer to hilltops and riverbanks, which are [...] [substantially] vulnerable to erosion if trees are chopped down” (BBC, 2018). In addition, the budget for the Ministry of Environment has been cut by 43 per cent, and the government has cut 44 per cent of the budget of its science programmes researching GHG emissions and climate change (Schiffman, 2017). The Brazilian Supreme Court also decided to provide an amnesty from fines owed for illegally deforesting before 2008, in return that landowners would, rather than paying the fines, replant most of the cleared area or preserve the same amount of land elsewhere (BBC, 2018). Furthermore, the National Congress of Brazil are currently discussing amending the property registration rules as, by now, have been carried out through the CAR mechanism. The planned amendment would allow landowners to register land which has been informally occupied, and, in addition, the land area which a landowner can regularise would be increased by 25 sq. kilometres (Arsenault, 2017).

4.10.1 Effects of the Changes to the New Forest Code

During the last decade, with ambitious policies such as the PPCDAm, REDD+, and the PNMC, Brazil has been the forerunner of decreasing deforestation and reducing GHG emissions related to deforestation (Biderman & Nogueiron, 2016). However, the Supreme Court Changes and reviewed version of the New Forest Code, are causing concern among environmentalist and climate change experts, as they fear the policy changes will lead to more deforestation and an increase in GHG emissions (Biderman & Nogueiron, 2016). Moreover, according to INPE, the fears of the experts are reasonable, as deforestation has increased by 29 per cent just in the period from August 2015 to July 2016 (Visser, 2016). In the latest assessment conducted by the Climate Action Tracker, it is stated that with the currently implemented policies Brazil will reach GHG emission levels of 1.047 MtCO₂ in 2025, respectively 32 per cent above 2005 levels and 99 per cent above 1990 levels, meaning that Brazil will need to implement additional policies to meet the targets pledged to the UN (Climate Action Tracker, 2018). Furthermore, the International Energy Agency (IEA) has even projected that the GHG emissions from deforestation in Brazil will continue to rise in the decades to 2040 unless new policies are introduced (Timperley, 2018).

5. Assessing Brazilian Deforestation Policies

5.1 the SDG13 Framework

In the previous chapter, this thesis presented and discussed the most prominent policies regarding deforestation, and what effect these policies have had. Furthermore, to analyse to what extent Brazilian deforestation policies have contributed to the achievement of SDG13, it is essential to use the criteria from the chapter on the framework of SDG13, to evaluate whether Brazil has met the criteria through the policies on climate change and to what extent. The table below (*Figure 15*) illustrates the six criteria created by the UNDP to assess Brazil and its deforestation policies.



Figure 15. UNDP Assessment Criteria for Brazil regarding deforestation

5.1.1 Create an environment for enabling policies to protect the environment

The first evaluation criterion of the SDG13 framework, speaks of the essence in addressing climate change through eco-social policies, together with a policy shift towards implementing objectives from the development strategies. In other words, to promote sustainable development, Brazil had to provide an enabling environment that aims for protecting and conserving the environment, nature, and in this case, the Amazon rainforest.

There are several methods the Brazilian Government could use to create this environment, for instance through discussion on climate change, discussion on the cost and benefits, and to act on the issues. First, results from the previous chapter indicate that the Brazilian Government has provided several opportunities for the discussion on climate change. Even though the most prominent climate change policies took place after the mid-2000s, one can even indicate that the initial discussion on climate change begun with the Forest Code law in 1965. Since the Forest Code, there have been several arenas of climate change discussion, for instance, but not limited to, during the formation and implementation of the PPCDAm, the Presidential Decree. No. 6.321, and the PNMC. Secondly, REDD+ enabled an environment for discussion on the cost and benefits in Brazil. For instance, when Brazil cooperated with initiating REDD+ in 2005, it was to ensure that economic losses from decreasing deforestation would be covered and not impact the population of the Amazon states. The government was aware that decreasing deforestation would indeed impact the economic development, thus making it even more important to participate in a benefit programme, such as REDD+. In 2005, when the Brazilian Government agreed to REDD+, it sparked several debates within the governmental agencies, not only regarding climate change, but also regarding the benefits of reducing deforestation and GHG emissions. To prevent corruption, it became evident that the government itself could not oversee the compensation received, and therefore created the Amazon Fund, managed by the Brazilian Development Bank. Furthermore, in 2009 the Ministry of Environment proved a decrease in deforestation, and therefore, received a compensation of \$110 million from the Norwegian Government. Third, based on results previously presented, it is evident that the policymakers in Brazil have devoted effort to act on the issues arisen from the internal climate change discussions. However, an issue which has arisen is the budget cuts of the Ministry of Environment. In 2018, the government cut the budget for the ministry by 43 per cent, causing the decrease of funding for several environmental programmes run by the ministry. The Ministry of Environment is the main governmental agency which oversees the deforestation policies, and such a significant cut of budget will indefinitely decelerate the ability to create a policy enabling environment.

5.1.2 Ensure that deforestation policies are being adhered at a regional level

The second evaluation criterion expresses the importance of coherence between federal and regional governance in the case of decision-making and implementation. The UNDP has stated that it is crucial that the Federal Government of Brazil ensures improvement of regional governance, as it has become evident that previous deforestation policies are not being adhered at a regional level. To meet this criterion, it must be proven that there are

efforts put in place to improve regional governance, such as the Federal Government of Brazil ensuring proper implementation of deforestation policies and proper monitoring of the policies by the regional government. Since the commitment to the SDGs and 2030 Agenda in 2015, there have been no further policies implemented on the case of regional governance. Thus, to evaluate to what extent the Brazilian Government is meeting this criterion, the previous policy discussing regional governance must be discussed.

The most recent policy discussing regional governance is the New Forest Code from 2012, which was implemented to enforce landowners to register their properties through the CAR mechanism, as an attempt to decrease illegal deforestation. However, in exception of the CAR mechanism, the most important aspect of the New Forest Code was the change of implementation and monitoring governance, as the forest management and enforcement of environmental laws became decentralised. The Brazilian Government decided to let the municipalities and state governments oversee the implementation and monitoring stages, rather than the Ministry of Environment, as this would decrease costs and hopefully improve the monitoring process. However, according to the two experts interviewed, Mr. Pinto and Mr. Fernandes, the shift of governance has created severe implications. Both interviewees implied that corruption in the regional governments and municipalities is making it impossible for the policies to be properly implement and monitored. For instance, Mr. Pinto stated that in many of the Amazon municipalities there is no proper structure to enforce deforestation policies, as many of the local officials are corrupt. According to Mr. Pinto, there have even been cases where the those who have reported suspect of corruption to the federal government have been killed, and many of the deaths have not been further investigated. Furthermore, the difficulties of adequately utilizing the CAR mechanism has been raised. As stated by Mr. Pinto, it is not flaws with the mechanism itself which causes the difficulties, it is rather the method of proving ownership of property. One proves ownership through registering at the local notary's office, but cases of corruption have caused the authorisation of landowners to register illegally occupied land. According to Mr. Fernandes, the deforestation policies will not be properly implemented until the federal government applies external monitoring tools, for instance monitoring tools run by the UNDP or other UN agencies. Furthermore, Mr. Fernandes states that the municipalities will continue to take advantage of the loopholes in the laws to increase economic development, and changes will need to be made on a federal level to enforce regional compliance to the deforestation policies.

5.1.3 Government must raise public awareness on the issue of climate change

The third evaluation criterion urges the importance of raising public awareness on the issue of climate change, as public attitude and approach towards the issues are an essential part of shaping the Brazilian society. The UNDP has stated that the Brazilian Government should raise public awareness through measures deemed the most fitting for the community. These measures could include activities, such as creating social media platforms, appointing SDG ambassadors, and produce and distribute SDG material. Moreover, when Brazil committed to the SDGs in 2015, the government also created several agencies and programmes to promote the 2030 Agenda. To initiate inclusive participation, the RIO+ centre has been utilised to organise dialogues and conferences regarding the SDGs open to the Brazilian youth, university students, and people from all corners of Brazil. In addition, the National Commission established to internalise the 2030 Agenda, created three major instruments to raise public awareness and to include community participation. The three major instruments created are all internet platforms, which enables the Brazilian community to discuss, engage, and influence the public policies regarding the SDGs. Furthermore, the instruments created, Dialoga Brasil, Participa Portal, and the georeferencing portal, have enabled community participation and facilitated the increase of public awareness regarding the SDGs and on the issue of climate change. However, it should be mentioned that not everyone in Brazil have access to the internet or have sufficient financial resources to go to Rio de Janeiro to visit the RIO+ Centre. Thus, to involve the participation on all social levels in the Brazilian society, it would be necessary to further distribute materials or find other methods of inclusive participation.

5.1.4 Government must include civil society in the development and implementation of policies

The fourth evaluation criterion urges the importance of facilitating partnerships between the government and civil society. The UNDP states that central to the quality of implementing the SDGs is the multi-stakeholder approach. The requirement of the criterion is that the Brazilian Government includes different civil society groups, such as universities, private sector, and other development actors, in the development and implementation of policies. Results from the previous chapter shows that many of the deforestation policies implemented in Brazil were part of a collaborative effort between the government and civil society groups, however, most being from after 2015. Before the commitment to the 2030 Agenda in 2015, there was one prominent deforestation policy which was developed in cooperation with civil society.

The PPCDAm, which marked one of the major political turning points on conservation, was a policy part of a collaborative effort between federal, state, and municipal governments, in cooperation with specialised organisations and civil society groups. It was essential to the Brazilian Government that the policy was developed in-cooperation with civil society groups, as it would introduce new innovative ideas for monitoring, environmental control, and territorial management. This collaboration allowed for increased monitoring capacity and training of environmental personnel, as many of the civil society groups involved received the opportunity to take part of the implementation and monitoring activities. In addition, the policy allowed for a collaboration of monitoring between several civil society groups, such as the INPE and Ibama, who have since the passing of the PPCDAm been collaborating on the regular production and distribution of georeferenced digital maps regarding recent changes to the forest. However, it was first after the commitment to the 2030 Agenda in 2015 that the Brazilian Government begun to include civil society in the development and implementation of policies. For example, the National Commission for the SDGs was created for this exact purpose, and was therefore composed of 16 representatives from Federal, State, and Municipal governments, and civil society actors. Moreover, the three levels of government make up 16 representatives, and in addition to this, the civil society groups include the production sector, the third sector, and the academic community. The civil society groups make up the most representatives of the commission, and include organisations, such as industry sectors, workers unions, higher education institutions, and scientific communities. Furthermore, the commission has the official status of being one of the main institutional mechanisms for the implementation of the 2030 Agenda, and it has the power to influence policy-making, decision-making, and works with providing transparency to the acts taken to achieve the SDGs in Brazil.

5.1.5 Government must review and strengthen existing deforestation policies

The fifth evaluation criterion states that the Brazilian Government must review and strengthen the existing policies put to place to decrease deforestation and GHG emissions. According to the UNDP, this could be achieved by prioritising the targets set out in SDG13 and further modify policies, or by developing and adopting new policies which align with the goals set out in the 2030 Agenda.

Three months after the commitment of the Brazilian Government to the SDGs in 2015, the President of Brazil, Dilma, was impeached. This followed a political turmoil in Brazil, and no further policies regarding deforestation, GHG emissions, or climate change, other than the ones implemented simultaneously with the SDG-policy in September 2015, were discussed or reviewed. However, starting in 2017, the Congress in Brazil began reviewing the New

Forest Code from 2012, and in February 2018 the Brazilian Supreme Court allowed major changes to the law. These are the only changes that have been made to the existing deforestation policies, and no further policies have been developed or implemented. The changes to the New Forest Code included reducing the amount of deforested land which had to be previously restored, drastically cutting funds for forest conservation programmes, and reducing the size of conservation areas in the Amazon. Furthermore, as previously discussed, the Congress also decided to decrease the budget for the Ministry of Environment by 43 per cent, and in addition, decrease the budget of the science programme, which researches GHG emission from deforestation, by 44 per cent. In addition, the Supreme Court provided amnesty to fines for illegal deforestation before 2008, meaning that landowners who committed illegal logging before then does no longer need to pay the fines.

5.1.6 Government must monitor deforestation, GHG emissions, and take accountability

The sixth and last criterion of the SDG13 assessment scheme speaks of the importance of timely, relevant, and high-quality information on the efforts of decreasing deforestation and GHG emissions. The criterion implies that to enable well-informed decision-making and to adequately monitor development progress, it is important that the Brazilian Government monitors the rate of deforestation and GHG emissions emitted, and in addition, is transparent in their work and makes the data available to the public. According to the UNDP, the government can fulfil the sixth criterion by proving development in three different areas. First, the Brazilian Government must increase funding to statistical systems and creating systems of data-collection and registration. Secondly, as the SDG13 also covers the commitments made to the Paris Agreement, the Brazilian Government must prove to be taking accountability and prove Brazil's intent to reduce GHG emissions. Therefore, it must be proven that the government has the sufficient policies implemented to be reducing GHG emissions by 37 per cent compared to 2005 levels by 2025. Third, the government must take accountability and prove efforts to be changing any insufficient policies.

Firstly, as the results presented in the previous chapter imply, there are several statistical systems, systems of data-collection, and systems of registrations which has been implemented by the Brazilian Government. The most prominent policy which included the implementation and increased investment of these systems was the PPCDAm, implemented in 2004. The law initiated four systems to monitor forest cover status, which allowed governmental agencies to monitor the spatial dynamics of deforestation. In addition, the systems were programmed to issue regular warnings on illegal deforestation

to the agencies in charge of enforcing operations on the ground. The CAR mechanism was also an important system, as it is the first system implemented by the Brazilian Government in the effort to register every privately-owned property in Amazon.

Next, the Brazilian Government must prove the intent to reduce GHG emissions according to the commitments made to the Paris Agreement. The government committed voluntarily, which became law through the PNMC, to reduce GHG emissions by 37 per cent compared to 2005 levels by 2025. According to the latest report from the Climate Action Tracker, Brazil has already reduced 36 per cent of its GHG emissions compared to 2005. However, it is also reported that due to an increase of emissions from the energy sector and illegal deforestation after the implementation of the New Forest Code, it is unclear to say where the GHG emissions of Brazil stands today, as the mechanisms that monitor GHG emissions from deforestation cannot monitor real-time emissions.

Lastly, despite the instruments and policies implemented after the commitment to the SDGs, recent developments in the political image of Brazil is making it difficult to determine whether the Brazilian Government is taking adequate accountability. In addition, there has been no new policies on deforestation implemented since the New Forest Code, and according to data from Imazon, the New Forest Code caused deforestation rates to increase substantially. From August 2012 until July 2013 deforestation increased by 92 per cent, compared to the period from August 2011 to July 2012. Furthermore, in 2018 there were changes made by Congress and the Supreme Court on the New Forest Code, however, no changes were made which imply taking accountability on the increased deforestation.

6. Conclusion

The main goal of the thesis was to determine to what extent Brazilian deforestation policies have contributed to the achievement of SDG13. Deforestation of the Brazilian Amazon rainforest has been scientifically proven to be one of the major causes to climate change and one of the biggest threats to development. The UN has stated that to combat and reduce the impacts of climate change, it is important to promote sustainable development. Hence in 2015, the UN began to facilitate the 17 SDGs, currently the most prominent initiative concerning sustainable development. To combat climate change, the UN created SDG13, with a distinctive focus on Brazil and the Amazon rainforest. The SDG13 includes several targets and indicators regarding the reduction of deforestation, decreasing GHG emissions coming from deforestation, and implementing climate change mitigation policies.

To answer the main goal of this thesis, it was essential to divide the research into three sub-questions. The aim of the first sub-question was to comprehend the content of the SDG13 and its targets. The second sub-question looked at what deforestation policies had been developed and implemented by the Brazilian Government. The final sub-question analysed how successful the policies have been towards achieving SDG13. The first sub-question allowed a comprehensive description of the effort of the UNDP towards assisting Brazil, and creation of the SDG13 framework. The framework was used to set the criteria for evaluation if the deforestation policies in Brazil have contributed to the achievement of SDG13. The investigation identified six criteria regarding deforestation set out in the SDG13 framework, covering various subjects such as the percentage of GHG emissions to civil society inclusiveness. The second sub-question allowed for an extensive discussion of the most prominent deforestation policies implemented by the Brazilian Government, and what effect these policies have had on both the environment and future politics. The policies, ranging from the Forest Code in 1965 to the PNMC in 2009, were chosen due to their prominent impact on the history of deforestation. This study has shown that there have been several effects reported from the deforestation policies discussed, such as a reduction in deforestation, creation of international agreements, and a decrease of GHG emissions coming from deforestation. The third sub-question allowed for an analysis of the effect of the deforestation policies, and further, an evaluation of the policies through the six criteria set out in the SDG13 framework. Through the criteria, the UNDP suggests instruments and methods which Brazil should use and implement in their deforestation policies to achieve SDG13. One of the most significant findings to emerge from evaluating the SDG13 framework is that the criteria are based primarily on recommendations of implementation tools. In the six criteria, the UNDP states different obligated measures for Brazil, yet many

of these criteria are not measurable. For instance, one of the criterion calls for the Brazilian Government to review and strengthen their existing deforestation policies, yet it is not specified by the UNDP what must be done to strengthen the policies. Furthermore, another criterion speaks of the Brazilian Government taking accountability by proving efforts to change the path of direction, but likewise to the previous criterion, accountability is not adequately defined by the UNDP and therefore not measurable.

By all counts, and with the proven results, the findings of this study suggest that the Brazilian deforestation policies have contributed to the achievement of SDG13 to some extent. The evidence from this study suggest that the Brazilian Government has achieved many of the criteria of the SDG13 framework, at least the criteria which are possible to measure. For instance, the government has implemented several measures to include civil society and to raise public awareness, such as by teaching about climate change and its effects. Furthermore, the Brazilian Government has also managed to decrease the GHG emissions coming from deforestation by implementing the PNMC. Through the PNMC, the Brazilian Government aimed for a 37 per cent reduction in GHG emissions compared to 2005 levels by 2025, and the latest reported measurements imply that Brazil is at a 36 per cent reduction compared to 2005.

On the other hand, the experts interviewed in this study suggest that the Brazilian Government has not achieved many of the detailed targets in the criteria. According to them, it depends on what perspective you look at it from. If evaluating it from the perspective of numbers and reduction of GHG emissions and deforestation, then the Brazilian Government has achieved it. However, from a political perspective it has not been achieved, if considering the corruption, decentralisation of governance, and drastic decrease of economic development. The political criteria of SDG13 have not been achieved, such as strengthening deforestation policies, taking accountability, and ensuring that the deforestation policies are being adhered to at a regional level. Moreover, a part of achieving the SDG13 is to first understand why illegal deforestation is taking place in the Amazon rainforest, and thus implement strengthened deforestation policies with this in consideration. However, the government has failed to discuss that for most of the people living in the Amazon the only way to make a living is through agriculture and cutting down trees. Therefore, if the government solely bans deforestation but presents no alternative to the population living of it, illegal logging will take place, which will drastically affect the economic development. In addition, the UNDP has ranked Brazil in the 55th percentile of achieving SDG13, and no further measures to strengthen the deforestation policies have been taken by the Brazilian Government since this evaluation. Overall, the findings of this

study and the ranking of Brazil provided by the UNDP strengthens the idea that Brazilian deforestation policies have only contributed to the achievement of SDG13 to some extent.

More information on the achievement of Brazil towards SDG13 would help us establish a greater degree of accuracy on this matter. Moreover, findings suggest that there is not enough information available to measure it adequately. For instance, the latest georeferenced satellite images show that deforestation has drastically increased in the Amazon, but due to scientific constraints and no real-life measurement mechanisms of GHG emissions coming from deforestation, it is impossible to already analyse how this will affect the emission percentage for Brazil. Furthermore, due to the political turmoil and changes happening in the Brazilian Government in 2018, findings of this study suggest this can have several important implications for future practice.

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8. Appendices

8.1 List of terms

Amazon Fund: financial mechanism created by REDD+

ANDIFES: National Association of Directors of Federal Higher Education Institutions

CAR: registration mechanism created by the New Forest Code

Climate Change: a change in global or regional climate patterns

Climate Models: systems of differential equations based on the law of physics

Climate Proxies: sources of climate information from natural archives (tree rings, ice cores, corals)

CNI: National Confederation of Industry

Deforestation: the action of clearing a wide area of trees

Dialoga Brasil: Brazil Dialogue (*English translation*)

Forest Code: Law. No. 4.771

Greenhouse Gasses: a gas that contributes to the greenhouse effect by absorbing infrared radiation

Ibama: Brazilian Institute for the Environment and Renewable Natural Resources

IEA: International Energy Agency

INPE: National Institute of Spatial Research

MAPS: Mainstreaming, Acceleration, and Policy support System

NASA: National Aeronautics and Space Administration

New Forest Code: Law of Protection of Native Vegetation (Law. No. 12. 651)

Paris Agreement: agreement within the UN dealing with GHG emissions mitigation and adaption

Participa Portal: Participation Portal (*English translation*)

PIK: Potsdam Institute for Climate Impact Research

PNMC: National Policy of Climate Change (Law. No. 12.187)

PPCDAm: Action Plan for the Prevention and Control of Deforestation in the Legal Amazon

PSDB: Brazilian Social Democratic Party

PT: Worker's Party

REDD+: Reducing Emissions from Deforestation and forest Degradation

RIO+ Centre: UNDP World Centre for Sustainable Development

Rulista Bloc: part of the Brazilian Government which represents agribusinesses and large landholders

SBPC: Brazilian Society for the Advancement of Science

SDG13: Sustainable Development Goal 13

SDGs: Sustainable Development Goals

Task Force: entity monitoring and reporting the achievement progress of Brazil regarding the 2030 Agenda

The UN 2030 Agenda: the 17 Sustainable Development Goals

UGT: General Workers Union

UN: United Nations

UNDG: United Nations Development Group

UNDP: United Nations Development Programme

WWF: World Wide Fund for Nature

8.2 Interview Transcripts

8.2.1 Interview Transcript with Mr. Pinto

Interviewer: Frida-Marie Andestad Elstad - student in the European Studies Programme at the Hague University of Applied Sciences.

Interviewee: Luis Carlos Guedes Pinto - an agronomist, who currently works as a professor at the University of Campinas in Brazil, teaching agricultural economics. Previously, he has been the Vice-President of the Bank of Brazil (Banco do Brasil), and held the position as Minister of Agriculture from 2006 to 2007 under the government of former President Lula.

Interview Setting: Interview conducted in a café in the Hague, the Netherlands.

(Start of Interview)

Interviewer: What is your name and what was your position in the government of Brazil in 2006-2007?

Interviewee: Meu nome é Luis Carlos Guedes Pinto. Eu tive varias posições mas atualmente estou aposentado. Já ocupei varias posições no governo, não sei se interessa saber quais. Foram muitas, porque sou engenheiro agrônomo ha 52 anos, então 52 dois anos de profissão. Eu diria para você que a posição mais importante foi a de ministro de agricultura, eu fui também secretario da agricultura do estado de são Paulo. Fui vice-presidente do banco do Brasil, que e o maior banco do pais e talvez também seja importante saber que sou professor da universidade de Campinas, em economia agrícola. Bom, essa e minha formação.

Interviewer: During your time in the ministry, what policies, agreements, and co-operations were implemented and initiated regarding deforestation practices?

Interviewee: Eu quero explicar uma coisa para você, em alguns países, talvez isso seja o caso na Holanda ou na Noruega, o ministério que cuida da agricultura é o mesmo que cuida da floresta. Mas no brasil e completamente separado. O ministério de agricultura é responsável, orienta e cuida da produção agrícola e existe um ministério do meio ambiente, que é outro ministério que cuida das florestas. É muito importante dizer que ha muito conflito entre os dois ministérios, o ministério de agricultura esta muito vinculado aos setores da sociedade da produção, dos produtores rurais. E de outro lado o ministério do meio ambiente é o responsável por proteger a natureza. Então, ha muito conflito na ocupação das aeras que ainda são florestas, é importante dizer isto. Fui um ministro de agricultura atípico, não muito comum. A maioria dos ministros de agricultura são muito ligados a produção, não e meu caso. Eu não sou um produtor rural, então não sou um ministro mais ou menos o padrão. Mas eu conheci um pouco essa sua questão que você esta estudando. No passado, ate 40 anos atrás, o ministro de agricultura era responsável também pelas florestas mas depois separou. Voltando a sua pergunta, as politicas de preservação do meio-ambiente não estavam na minha responsabilidade. Estavam na responsabilidade do ministério do meio-ambiente, é importante dizer isso. Na maioria dos países do mundo, estão juntas essas duas coisas, inclusive a pesca.

Interviewer: Você sabe de algumas leis ou policies que tem haver com desmatamento?

Interviewee: Pois e, as politicas de preservação do meio ambiente não estavam na minha responsabilidade. O Brasil tem uma legislação em relação ao meio ambiente muito rigorosa, quer dizer muito stricto, forte. E é muito avançado e moderno, a legislação. Depois vamos falar, porque uma coisa é ter a lei, depois vem a aplicação, isso é outro problema. Para você ter uma ideia, no Brasil hoje você tem 8,5 milhões de km², é um território muito grande. Dentro do território, você tem as áreas protegidas. São áreas muitos grandes, que por um lado são os parques nacionais. Então tem uma área do país muito grande com parques florestais, são dois a três milhões de hectares. E além dessas áreas protegidas de parques nacionais que são regulados pelo ministério do meio-ambiente você tem muitas áreas indígenas, que são áreas protegidas também. Quase 40% do território brasileiro, ou seja 3,5 a 4 milhões de quilômetros da terra é protegida, ou por ser áreas de parques e florestas nacionais ou áreas indígenas. É uma proteção muito grande, poucos países do mundo tem isso. Teoricamente é intocável. Além disso, a legislação brasileira prevê mais

dois tipos de áreas protegidas, são as áreas nas margens dos rios. Estas áreas próximas dos rios, e as áreas de montanha também são protegidas então nas propriedades rurais, que são privadas, as fazendas, isto aqui é protegido. Você tem uma área protegida na margem do rio e em áreas onde depende da inclinada.

Interviewer: Essas áreas indígenas, o governo não tem autoridade sobre essas áreas?

Interviewee: Sim, o governo tem autoridade, o governo protege a área para outras pessoas não ocuparem, existe um órgão no governo que protege as áreas indígenas. então você tem áreas indígenas, áreas de florestas nacionais e estas áreas dentro das propriedades. E além disso a lei brasileira define que conforme a região do Brasil, o proprietário é obrigado a reservar uma parte da propriedade também em reserva particular. Então no sul do Brasil, 20% da propriedade, independentemente da área que não podem usar para cultivar, que é na margem do rio, eles tem que reservar mais 20% da propriedade como reserva florestal. No centro do Brasil, é 35% essa área. E no norte do país, que é a região amazônica, as propriedades rurais tem que deixar 80% da área de reserva. Então você vê que a lei brasileira é muito forte para proteger a natureza. Entretanto, apesar desta área, o grande problema é como fiscalizar, controlar a aplicação da lei. Não há uma estrutura governamental que permita aplicar a lei, então em muitas regiões do Brasil, principalmente na região norte, tem muito conflito porque a lei não é respeitada. Inclusive há mortes. É uma questão importante, você tem uma legislação que eu diria que é boa para proteger o meio ambiente, mas na prática o governo não tem uma estrutura governamental suficientemente preparada para fazer esses controles. Por outro lado, para você entender, um problema que eu conheci um pouco porque trabalhei no governo, é que os políticos que representam os interesses dos produtores rurais, que querem abrir as áreas, politicamente eles tem mais força que os políticos que representam a proteção do meio ambiente. Politicamente o seguimento da produção agrícola é muito mais forte do que o seguimento de proteção da natureza. Essa é a questão, como desenvolver mecanismos de controle e parlamento precisamos criar políticas que estimulem o produtor a proteger o meio ambiente. Fazer que o produtor se convença que é interessante proteger o meio-ambiente. Então essa é a contradição, o fato do Brasil ter as leis apropriadas mas não ter um controle preparado. (You ask, se tem muita proteção na Amazônia?) Sim, a Amazônia é muito grande, é pouquinho menor que a União Europeia, então em algumas regiões você tem produção. A produção na Amazônia é relativamente pequena, a grande produção agrícola brasileira está no sul e no centro do país que é 80% da produção. Na Amazônia a maior parte é floresta então são poucos produtos produzidos lá. Existe em algumas áreas, pequenas, muita produção de gado. São pequenas áreas, não muitas, mas é aí que está a origem do conflito, uns dos principais conflitos que é precisar desmatar para criar gado. Essa é a realidade, precisar matar floresta para poder produzir produtos e é uma questão complicada.

Interviewer: Mas como resolver isso?

Interviewee: Esse problema depende de um processo de conscientização. É preciso criar vantagens, para as pessoas protegerem também, ter estímulos, educação e consciência. E uma das políticas mais recentes, que é algo novo, são o que nos chamamos de que precisamos avançar você a fazer a certificação da produção. Ou seja, isso é um processo novo, você passar a exigir do produtor para que ele para produzir siga algumas regras. Exigindo do produtor que no processo produtivo ele respeite a lei, senão não compra seu

produto. Isso ainda esta em fase de implantação, que os produtores são obrigados a seguir as recomendações técnicas para produzir e fiscalizar isso. E não só que ele siga a legislação ambiental, mas também a legislação social. Ou seja, que ele cumpra a legislação trabalhista com seus funcionários. São duas coisas diferentes, uma certificação ambiental e uma certificação social e as duas estão em implantação. Esse é o caminho de você caminhar e avançar na proteção do meio ambiente e do trabalhador.

Interviewer: In 2008, Brazil announced a plan to reduce deforestation by 80 per cent by 2020, as a part of Brazil's National Climate Change Plan. After the Copenhagen Climate Change Conference, the government also enacted the National Climate Change Policy, legally confirming its voluntary reduction targets for greenhouse gas emissions. This is now already 10-years ago, but to what extent do you think that this is still a feasible goal to meet?

Interviewee: Não acredito que alcance a meta total mas é um procedimento que esta em processo. Com as dificuldades há um compromisso importante, mas tem forcas contrárias, então é uma contra dicção permanente. Houve um conflito permanente.

Interviewer: A part of the Sustainable Development Goals of the United Nations, SDG13 speaks of climate action and how important it is for countries to implement national legislations to help combat climate change. If looking at the deforestation laws implemented by the current government, to what extent is it feasible that Brazil will be able to decrease deforestation of the Amazon?

Interviewee: Acho que sim, mas não é fácil. Temos problemas, mas estamos tentando. Temos entre o ministério do meio ambiente e o ministério da agricultura muito conflito permanente, mas acho que é possível.

Interviewer: The process of formalizing and administering forest land rights in Brazil remains incomplete as it is estimated that 53 per cent of land in the Legal Amazon has uncertain property rights. If much of the deforested land area is privately owned, how does this affect the influence on the government over deforestation practices?

Interviewee: O processo da formalização dos direitos permanece incompleto. Então a pergunta é o seguinte, 55% da terra amazônica aproximadamente um pouco mais da metade da terra, não tem a propriedade definida. De fato é um problema, é um problema muito grave, muito sério. Estas terras seriam teoricamente do governo, mas os particulares ocupam a terra do governo. Isso é um conflito, onde as terras do governo são invadidas e o governo não tem forcas para controlar. Este é um problema principal que nos temos. Nós precisamos fortalecer as instituições no governo que protegem as áreas governamentais. É difícil de entender, porque o poder politico desse seguimento muitas vezes controla no governo local, como é que você prova que você é dono de uma propriedade? Você prova no chamado cartório. O pessoal dos cartórios é que legitima a propriedade, legitimar quer dizer tornar a propriedade efetiva e muitas vezes no governo local eles são corrompidos, eles não tem forca para confrontar com os grandes proprietários que ocupam as terras. Isso é corrupção em nível local e um problema político grave em nível nacional.

Interviewer: Deforestation in the Amazon declined from major peaks in 1995 and 2004, making it a major process for Brazil to reduce their greenhouse gas emissions. However earlier this year, Brazil's Supreme Court upheld major changes to law which protected the Amazon. The court also reduced penalties for past illegal deforestation, and these changes

reduced the amount of deforested land that must be restored under previous rules by 290,000 square kilometres. Environmentalists have stated that the revised Forest Code law, will create a culture which illegal deforestation is acceptable. How does this affect the efforts made by previous government regarding deforestation?

Interviewee: Você esta muito bem informada, isso é um problema bem recente, atual. Isso é outro problema político, porque a suprema corte legalizou muitos desflorestamentos no passado. As ações que foram feitas no passado ilegais e que os proprietários deveriam ser multados, penalizados, foram perdoadas pelo suprema corte. Eles falaram que daqui para frente os proprietários vão ter que cumprir. É como se você cometeu muitos crimes e eu não cometi nenhum, mas nós duas estamos perdoadas. Para mim, que respeitei a lei, o que adiantou? Quem não respeitou também esta perdoadada. Então isso desestimula o cumprimento da lei. Este é um tema muito discutido atualmente no Brasil, eu acho que foi um erro muito grande da suprema corte. Acredito que foi um erro grave e isso afeta gravemente a proteção ambiental negativamente.

8.2.2 Interview Transcript with Mr. Fernandes

Interviewer: Frida-Marie Andestad Elstad - student in the European Studies Programme at the Hague University of Applied Sciences.

Interviewee: Claudio Fernandes – an economist working for the Brazilian NGO *Gestos*.

Interview Setting: Interview conducted by email.

(Start of Interview)

Interviewer: To what extent have the policies, agreements, and co-operations implemented regarding deforestation in Brazil been efficient?

Interviewee: Not very efficient. There's not enough resource to fund fiscalization. Contradictory fiscal policies stimulate agro-business that tends to increase deforestation.

Interviewer: Which legislation has been the most influential towards decreasing deforestation?

Interviewee: Although the Forestry Code (Código Florestal) was signed in 2012, that guarantees an area of preservation of native areas (80% in the Amazon, 35% Cerrado, 20% all other regions) must be preserved in farming. Even so, when such a Code is taken at face-value, and has been since, it legally opens the gates for large scale deforestation in areas of old forests. This has been the case for the past five years in Mato Grosso, where soy agribusiness has practically wiped out the Cerrado and transitional ecosystems from the state, except for the National Indigenous Reserve of Xingu.

Interviewer: How can the UN contribute and support Brazil regarding decreasing deforestation?

Interviewee: The UN, at this point, could work well in two fronts: 1. Protect indigenous populations, the key protectors of what is left and is being decimated constantly; 2. Track the wood market, investigate extractivism better.

Interviewer: How can the Sustainable Development Agenda and, in specific, SDG13, encourage the Brazilian government to take more stricter measures towards decreasing deforestation?

Interviewee: The country must zero-out its rate of deforestation in the legal Amazon. It has not accomplished that, though the rate of deforestation has been flattening (IBGE only has data up to 2015) at around 0.1%, there has always deforestation happening. The problem of thinking in this box of rates and numbers is that the researcher (economist) does not see or has the visual dimension of what the numbers represent in reality. Though the country must reduce emissions to come even close to achieving Goal 13. Urban mobility is a big issue in the Brazilian cities, that responsible for a lot of emissions.

Interviewer: A part of the Sustainable Development Goals of the United Nations, SDG13 speaks of climate action and how important it is for countries to implement national legislations to help combat climate change. If looking at the deforestation laws implemented by the current government, to what extent is it feasible that Brazil will be able to decrease deforestation of the Amazon?

Interviewee: The government, in fact, the Forestry Code gave a break to the people that already had deforested completely before 2008. They did not need to recompose the native forests back to the legal requirements (80% in the Amazon, 35% Cerrado, 20% all other regions). With such legal requirements, the Amazon will continue to be deforested, unless the law changes. To try and get the dimension of the problem. In the Amazon everything is somewhat out of proportion. The territory itself is the size of continental Europe without Scandinavia. Land properties there are huge, thousands of hectares. Therefore, to be able to wipe out 20% of Amazon wood per property of 8 to 10 thousand hectares represents quite a size of continuous deforestation. [Take a look at a satellite view of google Earth on the state of Mato Grosso. Find Xingu and check the checker board pattern around it. This is how much has been deforested since 2012. All of this was forest. Is there any hope in the face of this kind of “progress”?

Interviewer: In 2008, Brazil announced a plan to reduce deforestation by 80% by 2020, as a part of Brazil's National Climate Change Plan. After the Copenhagen Climate Change Conference, the government also enacted the National Climate Change Policy, legally confirming its voluntary reduction targets for greenhouse gas emissions. This is now already 10-years ago, but to what extent do you think that this is still a feasible goal to meet?

Interviewee: Feasible in number in certain regions, but irrelevant to the problem itself. The continuation is this picture. [sends picture]

Interviewer: The process of formalizing and administering forest land rights in Brazil remains incomplete, as it is estimated that 53% of land in the Legal Amazon has uncertain property rights. If much of the deforested land area is privately owned, how does this affect the influence on the government over deforestation practices?

Interviewee: It would affect on the fiscalization end of things. The “uncertain property rights” is a euphemism for land grabbing through formal legal/institutional procedures for much land whose rightful owners are the indigenous populations. But these became *homo sacer* in the Brazilian (colonial as a matter of fact) path of development. They have been stripped

out of their natural rights to the territory where they inhabited for hundreds of years. They are being decimated.

Interviewer: Deforestation in the Amazon declined from major peaks in 1995 and 2004, making it a major process for Brazil to reduce their greenhouse gas emissions. However earlier this year, Brazil's supreme court upheld major changes to law which protected the Amazon. The court also reduced penalties for past illegal deforestation, and these changes reduced the amount of deforested land that must be restored under previous rules by 290,000 square kilometers. Environmentalists have stated that the revised forest code law, will create a culture in which illegal deforestation is acceptable. How does this affect the efforts made by the previous government regarding deforestation?

Interviewee: The efforts of all governments in the past twenty years have not been enough to break the path of deforestation. The economic development of the Amazon has always been designed with the growth-at-any-cost paradigm. In the field of Agriculture, extensive cattle raising has been the norm. The other projects for the region include hard core mining, large dams for the rivers, and more roads. These infrastructure projects have billions of dollars in line to be realized in time, some to be deployed soon. How do we expect to stop them and find a different, more integrated path of development that won't disrupt the rivers and the whole live ecosystem of the region? Can governments and people learn from their mistakes? Belo Monte is a good example of a 52 billion Real behemoth that has disrupted and displaced many a life to generate energy to the continuing path of destruction, for this is not a zero-sum game and nature has been losing for a long time and will continue to do so (unless something with impact happens.)

8.3 Interview Consent Forms and Student Ethics Form (the following pages)