

Brazilian policy after the Paris Agreement: early failure of the climate targets?

Política brasileira após o Acordo de Paris: fracasso precoce das metas climáticas?

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Abstract: The Paris Agreement represents a reorientation of the climate change regime. It is a more flexible and durable mechanism, towards a more bottom-up, global approach. In this sense, all the Parties were invited to voluntarily present their National Determined Contribution (NDCs) in order to fight global warming. This study uses the Brazilian case, to alert for action and awareness regarding “Paris” compliance and implementation. It explains that Brazilian pledges were considered to be inconsistent with Paris goals. Moreover, weak governance has led to a 9 per cent increase of greenhouse gas emissions in the past two years. This result goes in the opposite direction of Brazil’s commitments. One of the key factors for the success of Brazilian’s NDC will be strong environmental governance, the necessary review of the National Policy on Climate Change, as well as full implementation of the Forest Code, in the forthcoming years.

Keywords: Brazilian National Determined Contribution. Paris Agreement. Climate Change.

Resumo: O Acordo de Paris representa uma reorientação do regime de mudança climática. É um mecanismo mais flexível e durável, em direção a uma abordagem global ascendente. Nesse sentido, todas as Partes foram convidadas a apresentarem voluntariamente suas Contribuições Nacionalmente Determinadas (NDCs) para combater o aquecimento global. Este estudo utiliza

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o caso brasileiro para alertar para ação e conscientização sobre o cumprimento e implementação de “Paris”. Ele explica que as promessas brasileiras foram consideradas inconsistentes com os objetivos de Paris. Além disso, a fraca governança levou a um aumento de 9% nas emissões de gases de efeito estufa nos últimos dois anos. Esse resultado vai à direção oposta dos compromissos do Brasil. Um dos fatores-chave para o sucesso do NDC brasileiro será a forte governança ambiental, a revisão necessária da Política Nacional sobre Mudança do Clima, bem como a implementação completa do Código Florestal, nos próximos anos.

Palavras-chave: Contribuição Nacionalmente Determinada Brasileira. Acordo de Paris. Mudança Climática.

Introduction

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC) came into force on the 4th November 2016. It aims at holding the rise in global average temperatures by 2100 to “*well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels*”. The Paris Agreement was historic for many reasons. It represented a shift in the way of International Agreements on Climate Change have been conducted. It was agreed on a common system for developed and developing Nations, differently from what happened in Kyoto and also enabled a more flexible compliance system. To that end, 188 countries, which represent roughly 95 percent of global greenhouse gas (GHG) emissions, voluntarily pledged to reduce their emissions through a series of voluntary proposals in their statements of Intended Nationally Determined Contributions (INDCs) to the UNFCCC.

One of the most serious worries of environmentalists is if pledges and actions taken by countries to fight climate change will be sufficient to achieve the (well below) 2°C target. Even if the countries meet their INDCs, does not mean that the world will be a safer place to live from now on. In other words, pledges are not sufficient to keep the temperature from rising and the globe will continue to experience constantly warming. That is why the Agreement foresaw that goals translated in the Parties’ INDCs are supposed to be reviewed and incremented every five years to more ambitious levels.

The present study intends to use the example of Brazil, in terms of Paris Agreement implementation and compliance, to alert for action and awareness regarding mitigation of climate change. It discloses what has been done so far and what it is still lacking in order to reach its proposal NDC. What is Brazil's National Determined Contribution to comply with the Paris Agreement? Do Brazilian pledges play a significant role to fight climate change? What has been done so far in Brazil and what is still lacking? How can parties assess its compliance? Here are some of the questions that need to be answer.

To guide this study and to formulate the conclusions this article was based on legislation analysis by comparative and inductive methods. Regarding the policies for compliance with the Brazilian NDCs in the post-Paris period, it used the results of the study "The threat of political bargaining to climate mitigation in Brazil" by Pedro R. R. Rochedo; Britaldo Soares-Filho; Roberto Schaeffer *et al.*¹ Methodological approach for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals followed the applicable Intergovernmental Panel on Climate Change guidelines.²

1 Paris Agreement as a historical breakthrough

Traditionally, the responsibilities for reducing greenhouse gas emissions were divided between industrialized and developed countries. The Paris Agreement on Climate Change reflects a very different view of the world, creates more openness, and grants flexibility to the parties. The neat dichotomy between developed and developing countries no longer corresponds to reality.³ "Paris" put an end to this binary

¹ Pedro R. R. Rochedo, Britaldo Soares-Filho, Roberto Schaeffer, *et al.* The threat of political bargaining to climate mitigation in Brazil. *Nature Climate Change*. Volume 8. July, 9th, 2018

² Intergovernmental Panel on Climate Change (IPCC). 2013. Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (ed.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available at <http://www.ipcc.ch/report/ar5/> Last access September, 21, 2018.

³ "The UNFCCC's annex structure never perfectly reflected the principle of CBDR-RC. And as the global economy transformed, it became increasingly disconnected from reality. Countries that had rapidly developed and become among the richest in the world, such as Singapore and Qatar, were still classified as "developing." South Korea and Mexico remained non-Annex I parties, even after they had joined the Organization for Economic Cooperation and Development (OECD).

differentiation and made it clear that all countries have a part to play in reducing emissions. “Nations are in various states of development and there is simply no credible way to address climate change that doesn’t involve substantial participation by all the world’s high-emitting countries, including China, India, Brazil, and other rising nations”.⁴ More flexibility was seen in the agreement mainly because the so-called nationally determined contributions. These plans are evaluated regularly, and need to be renewed and upgraded every five years. It is required that all parties show evidence of their compliance and further actions in cutting their greenhouse-gas emissions. All countries must show their progression in their climate goals, and must apply the highest possible level of ambition in every plan they submit.⁵ And to promote stronger action, states’ NDCs are complemented by international norms to ensure transparency and accountability.

The new agreement accepts that countries, depending on their development status and wealth, have different starting point and while every party is progressing individually through its climate plans some differences still remain. Developed countries are expected to have the strongest ambitions, and should also bear the largest financial burden on stopping global warming. However, developing countries are encouraged to contribute voluntarily.⁶

To safeguard national decision-making, the Paris Agreement adopts a bottom-up approach, in which reflects rather than drives national policy. The new assessment model combines dynamism and flexibility – five-year cycles of renewed climate plans and evaluations. It allows states to decide themselves on how to contribute to the common goal, yet the high level of transparency of the process empowers civil society and the

Developing country emissions collectively surged ahead of developed country emissions. And China became the biggest emitter in the world, accounting for one-quarter of global emissions in 2012, roughly as much as the United States and European Union combined.” BODANSKY, Daniel. THE PARIS CLIMATE CHANGE AGREEMENT: A NEW HOPE? *American Journal of International Law*. The American Society of International Law; J. 288. April, 2016 (2016).

⁴ ROBERTS, David. The conceptual breakthrough behind the Paris climate treaty. *Vox* (2015). Available at: <https://www.vox.com/2015/12/15/10172238/paris-climate-treaty-conceptual-breakthrough>. Accessed in September, 2018.

⁵ VOIGT, Christina. The Universal Climate Agreement is Historic. Available at: <https://www.jus.uio.no/ior/english/research/news-and-events/news/2015/2015-12-22-voigt-climate.html>. Accessed in September 4th, 2018.

⁶ *Idem*.

international community to question a country's seriousness and ambitions in fighting climate change. The cyclical approach ensures that the process does not come to a stand-still.⁷ The result was a fundamental reorientation of the climate change regime; away from the rigidly differentiated "approach of the Kyoto Protocol, toward a more bottom-up, global approach".⁸

Paris was a breakthrough. Not because of the novelty's agreement content. Neither because states' initial emission reduction pledges under the Agreement are sufficient.⁹ At best, the NDCs put forward by countries in connection with the Paris Conference will limit temperature increase to 2.7 degrees Celsius.¹⁰ It was, for the first time, a unanimous and forward-looking agreement, an architecture that showed signs of being durable and effective over decades to come. Bodansky believes that "if Paris indeed proves to be historic it is because it institutionalizes a new paradigm that, over time, catalyzes ever stronger global action to combat climate change".¹¹

Bodansky highlighted the eight key major factors for the positive outcome, as follows. First, it is a legally binding instrument (although some non-binding content) in contrast to the 2009 Copenhagen Accord, which was a political deal. The Paris Agreement is a treaty within the meaning of international law. But the prescriptive force of provisions varies, and many are not formulated as legal obligations. Second, because it is global. It is applicable not only to developed countries, like the Kyoto Protocol's mitigation targets, but also to developing countries, which account for a growing share of global emissions: 188 countries had put forward their INDCs, representing roughly 95 percent of global emissions.

⁷ *Idem*.

⁸ BODANSKY, Daniel. THE PARIS CLIMATE CHANGE AGREEMENT: A NEW HOPE? *American Journal of International Law*. The American Society of International Law; J. 288. April, 2016 p. 292.

⁹ *Idem*.

¹⁰ According to Climate Action Tracker, full implementation of the INDCs submitted as of December 15, 2015, would put the world on a pathway to 2.4-2.7 degrees Celsius. *Effect of Current Pledges and Policies on Global Temperature*, CLIMATE ACTION TRACKER, Available at <http://climateactiontracker.org/global.html>. Accessed on September, 7, 2018.

¹¹ BODANSKY, Daniel. THE PARIS CLIMATE CHANGE AGREEMENT: A NEW HOPE? *American Journal of International Law*. The American Society of International Law; J. 288. April, 2016.

Third, it specifies the same core obligations for all countries, abandoning the static, annex-based approach to differentiation in the (UNFCCC) and the Kyoto Protocol, to a more flexible, calibrated approach, which takes into account changes in a country's circumstances and capacities and is operationalized differently for different elements of the regime. Fourth, it establishes a long-term, durable architecture. Fifth, the long-term architecture institutionalizes an iterative process, in which, every five years, parties will come back to the table to take stock of their collective progress and put forward emission reduction plans for the next five-year period. Sixth, it sets an expectation of progressively stronger action over time. Seventh, it establishes an enhanced transparency and accountability framework. States will have an incentive to carry out their NDCs, subjecting them to peer and public pressure. Eighth, it appears to command universal, or near universal, acceptance. The Paris Agreement is a relatively brief document and will need to be elaborated through decisions of the parties. That process began in Paris, in the conference decision adopting the Agreement. But many elements still need to be fleshed out, including rules, modalities, and guidelines for the new market mechanisms, the enhanced transparency framework, the five-year global stock-take and updating process.

Finally, Nations are ultimately going to act based on what they view as their own best interests. No International Treaty, "binding" or not, can force them to do otherwise. Ultimately, it relies on the only real weapons in the UNFCCC's arsenal: perception and peer pressure. It is based on transparency and common metrics that can be fairly evaluated.¹²

What the Paris architecture can do is rationalize a process that is already underway and, at the margins, accelerate it. It can clarify shared aspirations, send clear market signals, and document ongoing progress, fostering a positive feedback cycle of ambition. It can serve as a reminder that the family of nations owes its poorest members a helping hand, and that current commitments fall far short of just or wise.¹³

¹² ROBERTS, David. The conceptual breakthrough behind the Paris climate treaty. Vox (2015). Available at: <https://www.vox.com/2015/12/15/10172238/paris-climate-treaty-conceptual-breakthrough>. Accessed in September, 2018.

¹³ *Idem*.

The Paris Agreement is a reflection of national politics more than a driver. The architecture will grow stronger when and if countries become comfortable and confident on the path toward decarbonization: “(W)hether that happens depends on forces far larger than the United Nations”.¹⁴

2 Brazil’s national determined contribution

Brazil is expected to play a leading role in environmental negotiations. The South American country is one of the top 10 world’s biggest GHG emitters,¹⁵ the World’s ninth largest economy by nominal GDP and eighth largest by purchasing power parity. It is a unique case among industrialized countries, given that most of its emissions don’t result from energy use. Instead, the bulk of Brazil’s emissions come from land-use change and forestry, giving Brazil the position of the World’s largest emitter on this matter. Deforestation of the Amazon is believed to have emitted some 200 million metric tonnes of CO₂ into the atmosphere per year. Much of the deforested land has been used to graze cattle and grow soybean, Brazil’s two largest exports.

The South American country has a vast set of environmental laws regulating activities and aiming to protect its environment, which is considered to be a common asset to mankind. Some of the most biodiverse regions in the world are found Brazil, including the Amazon, the Cerrado, the Atlantic Forest and the Pantanal. The country has also some of the largest reserves of fresh water in the world and a third of the world’s remaining tropical forests. One in every 10 existing species of plants and animals is thought to live in Brazil.¹⁶

At the highest hierarchical level, the Federal Constitution of Brazil statues the sustainable development principle in the article 225 as follows:

Everyone has the right to an ecologically balanced environment, which is a public good for the people’s use and is essential for a healthy life. The Government and the community have a duty to defend and to preserve the environment for present and future generations.

¹⁴ *Idem*.

¹⁵ World Resources Institute. Climate Data Explorer (2016). Available at <http://cait.wri.org/>. Accessed on September 21, 2018.

¹⁶ WWF Global. Brazil. Available at http://wwf.panda.org/wwf_offices/brazil/about_brazil/. Accessed on September 21, 2018.

Brazil has ratified many International treaties related to the protection of the environment. There are also important domestic laws related to the matter with criminal and administrative liability, including sanctions, as for example the obligation to repair or indemnify the environmental damage caused. One of the most important is the National Environmental Policy, outlined in Federal Law n. 6,938/81, which aims to “preserve, improve and recover the environmental quality conducive to life, aiming to ensure the conditions for socio-economic development, the interests of national security and the protection of the dignity of human life”. Also, it is worth mentioning the Federal Law n. 9,605/1998, which statues criminal and administrative sanctions derived from conducts and activities harmful to the environment, and Federal Decree n. 6,514/2008, which provides administrative sanctions for the environment infractions. The Federal Law n. 12,651/2012 establishes the Brazilian Forestry Code.¹⁷ It provides general rules on vegetation protection, specially protected areas (such as Permanent Preservation Areas and Legal Reserve Areas), forest exploitation, and so on. Regarding specially protected areas, Brazil enacted Federal Law n. 9,985/2000, which establishes the National System of Nature Conservation Units and establishes criteria and rules for the creation, implementation and management of these conservation units. There are other important national policy acts, such as the National Water Resources Policy (Federal Law n. 9,433/1997), the National Waste Policy (Federal Law n. 12,305/2010) and the National Policy on Climate Change (Federal Law n. 12,187/2009). These laws and mechanisms demonstrate the importance of the environment for Brazilian policymakers.

As a Party of the United Nations Framework Convention on Climate Change (UNFCCC), Brazil has also signed the new UNFCCC International Climate Change Agreement (Paris Agreement), in December of 2015, which was ratified on September 21, 2016 and transformed into a domestic federal law, under Decree n. 9,073/2017. The Government of Brazil announced its Intended Nationally Determined Contribution

¹⁷ There were several lawsuits aiming the declaration of its unconstitutionality. This trial was finished in February, 28, 2018 when Brazilian Supreme Court (STF) recognized the validity of several provisions, declare some sections unconstitutional and attributed interpretation according to the Federal Constitution on others items. The subject was addressed in the joint judgment of the Declaratory Action of Constitutionality (ADC) 42 and the Direct Actions of Unconstitutionality (ADIs) 4901, 4902, 4903 and 4937.

(INDC) as a result of an agreed outcome with legal force under the UNFCCC applicable to all Parties. After its ratification in 2016, the “intended contribution” became legally binding and it is now considered to be Nationally Determined Contribution (NDC, for short).

The intended contribution was communicated under the assumption of the adoption of a universal, legally binding instrument. All policies, measures and actions to implement Brazil’s NDC are carried out under the National Policy on Climate Change (Law 12,187/2009), the Law on the Protection of Native Forests (Law 12,651/2012, referred as Forest Code), the Law on the National System of Conservation Units (Law 9,985/2000).¹⁸

As explained before, in the new “bottom up” approach of Paris Agreement, it is the States themselves, which propose their Nationally Determined Contributions (NDC). To achieve its goals, Brazil, for example, committed itself to increase the share of sustainable biofuels in the local energy mix to approximately 18 per cent by 2030, and, at the same time, to achieve a total amount of 45 per cent of renewable fuels and also restore and reforest 12 million hectares of forests and other actions that will be further discussed.

Brazil’s NDC has a broad scope including mitigation, adaptation and means of implementation, consistent with the contributions’ purpose to achieve the ultimate objective of the Convention, pursuant to decision 1/CP.20, paragraph 9 (Lima Call for Climate Action). Although its commitment is significantly important, a little has been done by Brazilian authorities to fight climate change since the ratification of the Paris Agreement and the deposit of its voluntary NDC in 2016. The country is committed to reduce GEE to 1.3 GtCO₂e by 2025 and 1.2 GtCO₂e by 2030, which is equivalent to 37% below 2005 levels in 2025.¹⁹

¹⁸ FEDERATIVE REPUBLIC OF BRAZIL INTENDED NATIONALLY DETERMINED CONTRIBUTION. Available at <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Brazil/1/BRAZIL%20iNDC%20english%20FINAL.pdf>. Accessed on September 7, 2018

¹⁹ FEDERATIVE REPUBLIC OF BRAZIL INTENDED NATIONALLY DETERMINED CONTRIBUTION. Available at <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Brazil/1/BRAZIL%20iNDC%20english%20FINAL.pdf>. Accessed on September 7, 2018.

Subsequently, reduce greenhouse gas emissions by 43% below 2005 levels in 2030.²⁰

Brazil's NDC corresponds to an estimated reduction of 66% in terms of greenhouse gas emissions per unit of GDP (emissions intensity) in 2025 and of 75% in terms of emissions intensity in 2030, both in relation to 2005. The corresponding estimates on greenhouse gas emissions per unit of GDP (emissions intensity) contained in its NDC, represents a substantial reduction of 48% in terms of emissions intensity in 2030 (using GTP-100, IPCC AR5).

The country has committed itself to adopt further measures, in particular: increasing the share of sustainable biofuels in the Brazilian energy mix to approximately 18% by 2030, by expanding biofuel consumption, increasing ethanol supply, increasing the share of advanced biofuels (second generation), and increasing the share of biodiesel in the diesel mix; strengthening and enforcing the implementation of the Forest Code; strengthening policies and measures with a view to achieve, in the Brazilian Amazonia, zero illegal deforestation by 2030 and compensating for greenhouse gas emissions from legal suppression of vegetation by 2030; restoring and reforesting 12 million hectares of forests by 2030; enhancing sustainable native forest management systems, through georeferencing and tracking systems applicable to native forest management, with a view to curbing illegal and unsustainable practices; achieving 45% of renewables in the energy mix by 2030, expanding the use of renewable energy sources other than hydropower in the total energy mix to between 28% and 33% by 2030; expanding the use of non-fossil fuel energy sources domestically, increasing the share of renewables (other than hydropower) in the power supply to at least 23% by 2030, including by raising the share of wind, biomass and solar; achieving 10% efficiency gains in the electricity sector by 2030; in the agriculture sector, strengthen the Low Carbon Emission Agriculture Program (ABC) as the main strategy

²⁰ Methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals: inventory based approach for estimating and accounting anthropogenic greenhouse gas emissions and, as appropriate, removals in accordance with the applicable IPCC guidelines. Coverage: 100% of the territory, economy-wide, including CO₂, CH₄, N₂O, perfluorocarbons, hydrofluorocarbons and SF₆. Reference point: 2005. Timeframe: single-year target for 2025; indicative values for 2030 for reference purposes only. Metric: 100 year Global Warming Potential (GWP-100), using IPCC AR5 values.

for sustainable agriculture development, including by restoring an additional 15 million hectares of degraded pasturelands by 2030 and enhancing 5 million hectares of integrated cropland-livestock-forestry systems (ICLFS) by 2030; in the industry sector, promote new standards of clean technology and further enhance energy efficiency measures and low carbon infrastructure; in the transportation sector, further promote efficiency measures, and improve infrastructure for transport and public transportation in urban areas.²¹

Before Paris, when Kyoto was playing a major role in reducing global emissions, Brazil had performed a leading role in the development of clean mechanisms, registering more than 2,500 projects and also enacted its own National Policy on Climate Change (Law n. 12,187/2009), that has established a voluntary commitment to achieve a GEE reduction of between 36.1 and 38.9 per cent by 2020 (however, such commitment shall be reviewed because of the new goals set in the Paris Agreement).²² Although ambitious goals and vast legislative repertoire, there are several points to be criticized and clarified, especially when public policies do not correspond to the targets set in the Brazilian NDCs.

While the nominal reduction targets appear to be challenging and ambitious at first glance, the real target represents very little effort beyond current ambition levels, taking into account that the base year for the NDC targets (2005) was a year with particularly high emissions, alert The Climate Action Tracker. Between 2005 and 2012, Land Use, Land-Use Change and Forestry (LULUCF) emissions decreased 86% in Brazil thanks to the successful implementation of anti-deforestation policies, resulting in a decrease of 55% in total net emissions in the same period. This means that the NDC effectively translate to a decrease of only 7% in emissions including LULUCF below 2012 levels by 2030. Excluding LULUCF, it is estimated that the NDC targets translate to an increase in emissions above 2005 levels of 15% in 2025 and 3% in 2030 (equivalent to 73% and 55% above 1990 levels [GWP-100; IPCC SAR]).

²¹ FEDERATIVE REPUBLIC OF BRAZIL INTENDED NATIONALLY DETERMINED CONTRIBUTION. Available at <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Brazil/1/BRAZIL%20iNDC%20english%20FINAL.pdf>. Last access September 7, 2018 p.3.

²² GARCIA, Lina Pimentel; Bezerra, Luiz Gustavo. The Environment and Climate Change Law Review. On line. Edition 2. BRAZIL. Feb, 2018. Available at: <https://thelawreviews.co.uk/edition/the-environment-and-climate-change-law-review-edition-2/1153044/brazil>. Accessed on September 4, 2018.

If all Countries targets were like Brazil's, the Global warming will stay between 2 to 3 degrees Celsius. Commitments within this range are not consistent in holding warming below 2° C nor with Paris Agreement 1.5°C stronger limit. Accordingly, the combined effects of the Brazilian's NDC are insufficient to ensure that global emissions are on a pathway consistent with the Paris Agreement temperature goal.

3 Pledges and targets: Brazil's policies towards Paris agreement compliance

In spite of good intentions, the Brazilian government took controversial actions that remove protection from forest reserves, threaten indigenous land rights and leads to a rise in deforestation. Emissions from land-use change grew 23% in 2016, compared to 2015, with more than 50% in the Amazon region, accounting for roughly half of all greenhouse gases released into the atmosphere by Brazil. This was driven by a 29% increase in Amazon deforestation during the period between August 2015 and July 2016, according to the National Institute for Space Research (INPE), a federal government research center. The emissions rise goes in the opposite direction of Brazil's commitments under the Paris Agreement, which include a target of zero illegal deforestation in the Brazilian Amazonia by 2030.²³

Environmental protection is linked to specific governance in Brazil. After the Impeachment of President Dilma Rouseff (2016), there were tensions and political crisis that had led President Michel Temer to sign decrees and acts in exchange of political support from the powerful rural lobby, which holds almost 40 per cent of the seats in Brazilian Congress, in a struggle to retain power and avoid responding to corruption accusations.²⁴

In the last two years, the Brazilian government has created acts and decrees, because of political instability and aiming to get support from landholders, that has been increasing deforestation and putting Brazil's goals to Paris Agreement at risk. Those acts include lowering

²³ CLIMATE ACTION TRACKER. Available at <https://climateactiontracker.org/countries/brazil/pledges-and-targets/>. Accessed in September, 2018.

²⁴ *Idem*.

environmental licensing requirements, which makes it easier for farmers to exploit new land indiscriminately; suspending the ratification of indigenous lands, which is generally associated with higher deforestation; and reducing the size of protected areas.²⁵

In a recent study, a team of Brazilian researchers²⁶ assessed the implications of the CO₂ emissions expected in different levels of environmental governance, as the capacity of the government and civil society to enforce the institutional arrangement to control deforestation, with respect to land-use change. In the research, they indicate the causality between the fragility of the government and its susceptibility to the pressure of interest groups, for what they call political bargaining to the detriment of the national interests.

In that sense, the study divided the last two decades of environmental governance in the Amazon into three major periods: pre-2005, with very poor governance despite the passage of some important laws that were not implemented; 2005-2010 period, with dramatic improvement in the governance (good governance) and very effective results in reducing deforestation; and 2011-2017 period, the stagnation of deforestation reduction policies and growing political signals incentivizing new clearings led to a gradual erosion of the governance (poor governance), the end of the deforestation reduction trend in 2012 and a sharp increase in deforestation.²⁷

Specific policies enacted by the Brazilian government and actions from the private sector led to the reduction of deforestation rates in the Amazon between 2005-2010. These policies included the increase in the number of fines and changes in law enforcement strategies, the creation

²⁵ Pedro R. R. Rochedo, Britaldo Soares-Filho, Roberto Schaeffer, *et al.* The threat of political bargaining to climate mitigation in Brazil. *Nature Climate Change*, v. 8, pages 695-698, 2018.

²⁶ Renato Crouzeilles, Rafael Feltran-Barbieri, Mariana S. Ferreira and Bernardo B. N. Strassburg respectively from the International Institute for Sustainability, Rio de Janeiro, Brazil. 2 Rio Conservation and Sustainability Science Centre, Department of Geography and the Environment, Pontifícia Universidade Católica, Rio de Janeiro, Brazil. 3 Department of Ecology, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil. 4 World Resources Institute, São Paulo, Brazil. 5 Universidade Veiga de Almeida, Rio de Janeiro, Brazil.

²⁷ ROCHEDO, Pedro R. R., SOARES FILHO, Britaldo; VIOLA, Eduardo (et al). The threat of political bargaining to climate mitigation in Brazil. Supplementary Online Material. *Nature Climate Change*. Available at: https://static-content.springer.com/esm/art%3A10.1038%2Fs41558-018-0213-y/MediaObjects/41558_2018_213_MOESM1_ESM.pdf. Accessed in September, 2018.

of new protected areas, and the soy deforestation moratoria.²⁸ On the other hand, it is estimated that between 2006 and 2015 Brazil has lost 30 Mha of natural vegetation – aggregation of 13 land cover classes of forests, savannahs, native grasslands and wet ecosystems, covering all six Brazilian biomes,²⁹ due to political crisis that has been a major driver of increased deforestation and carbon emissions in Brazil, especially after May, 2016.

Between 2005 and 2012, emissions were reduced by 54 per cent, mostly by cutting deforestation by 78 per cent.³⁰ On the other hand, between August 2015 and July 2016, almost 8,000 square kilometers of forest in the Amazon region were lost,³¹ an increase in deforestation of 30 per cent (compared to the same period of 2014 and 2015). As a result, greenhouse gas emissions increased by 9 per cent in the period.³²

²⁸ They affirm that the increasing deforestation is linked to the political crisis in Brazil since the widespread of social mobilizations in 2013, impeachment of president Rousseff in May 2016, and deepened with criminal charges against President Temer in May/September 2017. The new Forest Code approved in 2012, provided an amnesty to 58% of all areas illegally deforested before 2008, and that could incentivize future clearings. ROCHEDO, Pedro R. R., SOARES FILHO, Britaldo; VIOLA, Eduardo (et al). The threat of political bargaining to climate mitigation in Brazil Supplementary Online Material. *Nature Climate Change*.

²⁹ Collection 2 of annual series of land cover and land use in Brazil, 2000–2016. Mapbiomas Project Available at <http://mapbiomas.org/map#transitions>. Accessed in September, 2018.

³⁰ The Brazilian Decree 9.172 / 2017 established the System of National Emissions Registration (SIRENE) as an official instrument for the provision of GHG emissions, which aim to achieve the national and international Brazilian government, under the responsibility of the Ministry of Science, Technology, Innovations and Communications. Available at http://sirene.mcti.gov.br/documents/1686653/1706227/4ed_ESTIMATIVAS_ANUAIS_WEB.pdf/a4376a93-c80e-4d9f-9ad2-1033649f9f93. Accessed on September, 2018.

³¹ PRODES. (2017). *Texas anuais de desmatamento na Amazônia Legal Brasileira (AMZ)*. Available at <http://www.obt.inpe.br/prodes/dashboard/prodes-rates.html>. Accessed on September, 2018.

³² Methodology used in the study applies integrated assessment models (IAMs) that map the interactions between socioeconomic systems and energy and environmental processes and are used to develop emission scenarios, estimating the costs and benefits of mitigation policies and the economic impacts of climate change. IAMs experiences combine models from different areas of knowledge. An IAM called Brazilian Land Use and Energy System (BLUES) simulated the evolution of the Brazilian energy, industrial and waste sectors and their emissions under this budget constraint through 2050 (for further details on model documentation and updated information, please refer to http://themasites.pbl.nl/models/advance/index.php/Reference_card_-_BLUES). For the 2010-2030 period, the results from land use were provided by the detailed analysis of OTIMIZAGRO and simulated in the BLUES model, which optimized the energy system. In sum, BLUES has almost 28,000 technological nodes, of which roughly 8,000 are specific for the representation of the energy system and the additional 20,000 were developed for the representation of the land system. Roughly, a so-complex study has several limitations. The major ones are the budget associated with the 2 oC target, the representation of technological disruptive innovations, the availability of energy resources and technology costs. The using the integrated assessment model BLUES, they have set 2030 as the final year of the policy induced land-use

For the 2015 and 2016 period, deforestation in the Atlantic Forest biodiversity hotspot reached the highest level in 10 years (29,100 ha), representing an increase of 60%, which is now 88% deforested; while in the Amazon it increased 29% (789,800 ha), the highest rate in the past eight years.³³ “These alarming deforestation rates across Brazilian biomes have generated consequences that go beyond biodiversity loss and reduction in the provision of ecosystem services, such as carbon storage.”³⁴

The deforestation rise was due to illegal logging enabled by recent law enforcement leniency, forest code reform and land speculation. Illegal logging remains widespread in Brazil and often leads to broader forest degradation and deforestation. Illegal and unplanned conversion of forests into farms also remains a significant problem.³⁵

For the upcoming years in Brazil, the report projected three possible scenarios³⁶ (Strong, Intermediate and Weak Governance Scenarios)

change trends, allowing the model to run freely after that. Running the deforestation rates of the IEG scenario until 2050, BLUES was not able to find a feasible solution, meaning that it is not possible to keep these rates until 2050 and simultaneously cope with Brazil’s CO2 budget. See: ROCHEDO, Pedro R. R., SOARES FILHO, Britaldo; VIOLA, Eduardo (et al). The threat of political bargaining to climate mitigation in Brazil. Supplementary online material. *Nature Climate Change*. Available at: https://static-content.springer.com/esm/art%3A10.1038%2Fs41558-018-0213-y/MediaObjects/41558_2018_213_MOESM1_ESM.pdf. Last access September, 2018.

³³ Taxas anuais do desmatamento: 1988 até 2016. Instituto Nacional de Pesquisas Espaciais. Available at <http://www.obt.inpe.br/OBT/noticias/INPE-estima-desmatamento-por-corte-raso-na-Amazonia-em-2017>. Accessed in September, 2018.

³⁴ CROUZEILLES, Renato; FELTRAN-BARBIERI, Rafael, FERREIRA, Mariana S.; STRASSBURG, Bernardo B. N.. Hard times for the Brazilian environment. 2017. *Nature Ecology & Evolution*. Doi 1. 10.1038/s41559-017-0303-7. Available at: https://www.researchgate.net/publication/319017012_Hard_times_for_the_Brazilian_environment. Accessed on September 6 2018.

³⁵ SPERANZA, Juliana; ROMEIRO, Viviane; FEDER, Franklin Feder. WORLD RESOURCE INSTITUTE. Will Brazil Meet Its Climate Targets? July 07, 2017. Available at <https://www.wri.org/blog/2017/07/will-brazil-meet-its-climate-targets>. Accessed in Sept, 2018.

³⁶ This study uses as our database for emission calculations Brazil’s greenhouse gas inventory of the Third National Communication (TCN) submitted to the United Nations Framework Convention on Climate Change (UNFCCC). Ministério da Ciência, Tecnologia, Inovações e Comunicações (MCTIC), “Setor de uso da terra, mudanças do uso da terra e Florestas” (Tech. Rep. “Terceiro Inventário Brasileiro de Emissões e Remoções Antrópicas de Gases de Efeito Estufa”, 2015; Available at http://sirene.mcti.gov.br/documents/1686653/1706165/RR_LULUCF_Mudan%C3%A7a+de+Uso+e+Floresta.pdf). The total CO2 budget for Brazil used derived from the results of an international collective modelling effort called CDLinks available at <www.cdlinks.org>. The budget estimated in the modeling is the cumulative amount of CO2 Brazil would emit in a least-cost, worldwide effort to keep global average temperature increase “below 2 oC” by 2100 with a likely chance (67-100% probability), assuming an optimal (least-cost) worldwide mitigation strategy. ROCHEDO, Pedro R. R., SOARES FILHO, Britaldo; VIOLA, Eduardo (et al). The threat of political bargaining to climate mitigation in Brazil. *Nature Climate Change*, v. 8, pages 695-698, 2018.

considering land use, historical periods and emissions.³⁷ In the Intermediate Governance scenario the experts were not able to find a feasible solution, meaning that is not possible to keep these rates until 2050 and simultaneously cope with Brazil's CO₂ budget. Under the Weak scenario, the rest of the world would need to reduce its emissions to compensate for Brazil not accomplishing its part. Therefore, it would be possible for Brazil to fulfill its commitment by paying third parties to reduce their emissions in its place. Consequently, considering “*Weak Governance* scenario” if Brazil fulfill its commitment by paying third parties to reduce their emissions in its place at the market carbon cost, this would imply in an additional cost of about US\$ 2,440 billion.³⁸

Given the key role of the LULUCF sector in Brazil's NDC and the huge importance of Brazilian forests for environmental services, biodiversity, and carbon sequestration, the Brazilian government urgently needs to strengthen action instead of weakening it.³⁹ Budget cuts of 50% to the Environment Ministry,⁴⁰ 70% to deforestation monitoring authorities, and other areas raise issues of concern around the Government's ability to adequately monitor deforestation, as evidenced in the increased deforestation levels observed since 2016.⁴¹⁻⁴²

³⁷ “Most policy-relevant carbon budget estimates take into account the influence of non-CO₂ forcings by considering consistent evolutions of CO₂ and non-CO₂ forcings from integrated scenarios. Dealing with non-CO₂ sources in such a manner is especially important for assessing scenarios for Brazil, for two main reasons: almost half the GHG emissions in Brazil derives from methane, mostly from livestock, and nitrous oxide, from agriculture; given the potential role of bioenergy, for curbing CO₂ emissions, Brazil could easily intensify the use of energy crops for mitigating CO₂ emissions, whilst increasing N₂O emissions. Thus, the GHG emissions could actually increase and diverge from a 2°C pathway. Therefore, limiting non-CO₂ emissions even in a scenario with a CO₂-only budget is necessary, especially for the Brazilian case.” ROCHEDO, Pedro R. R., SOARES FILHO, Britaldo; VIOLA, Eduardo (et al). The threat of political bargaining to climate mitigation in Brazil. Supplemental online material. p. 33-34.

³⁸ *Idem*.

³⁹ Climate Action Tracker. Brazil. Overview. Available at <https://climateactiontracker.org/countries/brazil/>. Accessed in September, 2018.

⁴⁰ Climate Home. Brazil halves environment budget amid rising Amazon deforestation. Climate Home – climate change news. April 21, 2017, Available at <http://www.climatechangenews.com/2017/04/03/brazil-halves-environment-budget-amid-rising-amazon-deforestation/>. Accessed in September, 2018.

⁴¹ Climate Home. Brazil's Temer extends amnesty to Amazon land-grabbers. Climate Home – climate change news. July, 2017. Available at <http://www.climatechangenews.com/2017/07/17/brazils-temer-extends-amnesty-amazon-land-grabbers/>. Accessed in September, 2018.

⁴² Observatorio do Clima. Avanço da soja em áreas de desmatamento na Amazônia é o maior em cinco anos (2018). Available at <http://www.observatoriodoclima.eco.br/avanco-da-soja-em-areas-de-desmatamento-na-amazonia-e-o-maior-em-cinco-anos/>. Observatorio do Clima. (2016).

Not only has the enforcing capacity of authorities been reduced, but the Government has also started to reverse LULUCF policies already in place by removing protection from national forests.⁴³

While Brazil is starting to build policies to implement its climate commitments, such as recovering 12 Mha of native vegetation,⁴⁴ recent environmental setbacks, mentioned above, go against global environmental policies and put the chances of combatting deforestation at risk. “Brazil will only overcome these hard times when environmental conservation becomes a public policy priority again”, scientists warn.⁴⁵

Emissions in most sectors are expected to rise at least until 2030. To peak emissions and rapidly decrease levels afterward, as required by the Paris Agreement, Brazil will need to reverse the current trend of weakening climate policy, by sustaining and strengthening policy implementation in the forestry sector and accelerating mitigation action in other sectors – including a reversal of present plans to expand fossil fuel energy sources.⁴⁶

Negative results observed recently in the LULUCF sector would require deeper cuts in the emissions of other sectors for Brazil to be able to reach its NDC targets. The current policy emissions projections for Brazil are no longer in line with the achievement of the NDC targets.⁴⁷ Jose Marengo, Brazilian National Institute for Space Research, alerts: “the government has abandoned the environmental agenda, and considering how things have gone so far, I do not see how Brazil could

Desmatamento sobe 29%, o maior em 8 anos. Available at <http://www.observatoriodoclima.eco.br/desmatamento-sobe-29-o-maior-em-8-anos/>. Observatório do Clima. (2017). Desmate no cerrado anula ganhos na Amazônia. Available at <http://www.observatoriodoclima.eco.br/en/desmate-no-cerrado-anula-ganhos-na-amazonia/>. Accessed in September, 2018.

⁴³ Estado de São Paulo. (2017). Corte no orçamento do Inpe ameaça satélites e monitoramento da Amazônia – PROCLIMA – Programa Estadual de Mudanças Climáticas do Estado de São Paulo. Available at <http://cetesb.sp.gov.br/proclima/2017/11/25/corte-no-orcamento-do-inpe-ameaca-satelites-e-monitoramento-da-amazonia/>. Accessed in September, 2018.

⁴⁴ Decreto Federal n. 8.972 de 23 de Janeiro de 2017.

⁴⁵ CROUZEILLES, Renato; FELTRAN-BARBIERI, Rafael, FERREIRA, Mariana S.; STRASSBURG, Bernardo B. N.. Hard times for the Brazilian environment. (2017). *Nature Ecology & Evolution*. Doi 1. 10.1038/s41559-017-0303-7 Available at: https://www.researchgate.net/publication/319017012_Hard_times_for_the_Brazilian_environment Accessed on September 6, 2018.

⁴⁶ Climate Action Tracker. Brazil. Overview. Available at <<https://climateactiontracker.org/countries/brazil/>> Accessed in September, 2018.

⁴⁷ *Idem*.

be able to reach its greenhouse gas emission targets set out in the Paris Agreement”.⁴⁸

There is evidence that the economic cost of reducing deforestation is very low. Between 2000 and 2014, the budget from all federal agencies in Brazil related to deforestation reduction policies increased from nearly US\$ 500 million in 2000, to above 1 billion in 2011.⁴⁹ These investments explain why deforestation dropped by more than 70% in the same period. However, it still represented less than 0.01 percent of the country’s public spending. Furthermore, most deforestation reduction policies, such as the creation of protected areas in public lands and the creation of environmental requirements for the provision of public bank loans to farmers do not involve direct costs. For this reason, the main cost for reducing deforestation in Brazil is mostly political, as it involves challenging the powerful lobby of the rural caucus in the Brazilian congress.

For the 2017-2050 period, the total cost (which are conservative and do not account for biodiversity losses) to meet the same demand for energy and food in a scenario of low environmental governance is almost three times that the one associated with a higher environmental governance; “a loss of almost USD\$ 4 trillion imposed on the productive sector, which is more than two times as much Brazil’s current GDP”.⁵⁰

In these bargains the Brazilian economy loses a lot. It may even lose its long-term competitiveness in a world that increasingly values “green” products. High-level science converges in the sense of alerting to an important threat to Brazil and to the world as a whole.⁵¹

⁴⁸ ANDRADE, Rodrigo de Oliveira. Brazil on track for costly failure on climate targets. *Sci Dev Net*. 27/7/18. Available at <https://www.scidev.net/global/environment/news/brazil-on-track-for-costly-failure-on-climate-targets.html> Accessed em 7 de setembro de 2018.

⁴⁹ Cunha, F. A. F. S., Börner, J., Wunder, S., Cosenza, C. A. N., Lucena, A. The implementation costs of forest conservation policies in Brazil. *Ecological economics*. 130, 209-220, 2016.

⁵⁰ Behind the paper. The threat of political bargaining to climate mitigation in Brazil. Alexandre Szklo and Roberto Schaeffer, Universidade Federal do Rio de Janeiro. Sep 3, 2018. Available at <https://socialsciences.nature.com/users/176276-roberto-schaeffer/posts/38384-the-threat-of-political-bargaining-to-climate-mitigation-in-brazil> Accessed in September, 11, 2018.

⁵¹ *Idem*.

The present threat in Brazil is not limited to the loss of biodiversity, neither to the internationally-agreed commitments to the Paris agreement – and the larger goal – associated with the control of global climate change. The “threat” also refers to the negative impacts on the Brazilian economy and on the Brazilian people. As a consequence, Brazil will experience impacts that go beyond its borders, affecting projects that come from different sources of funds. For instance, the Norwegian Government, the major financier of the Amazon Fund, has contributed \$1.1 billion to Brazil’s Amazon fund since 2008, on actions to prevent, monitor, and combat deforestation in the Amazon, officially informed Brazil that if the new upward trend of deforestation is confirmed in the coming months they will halve investment for 2019 or even suspend financial assistance.⁵² From a political point of view, a reversal of the environmental governance framework is observed for bargaining with minority but overrepresented interest groups.⁵³

Conclusions

Over the past years, Brazil showed its commitment to many environmental issues by ratifying the most important International Law Treaties as well as enacted several developments in environmental domestic laws. Furthermore, Brazilian domestic legal order has an extensive set of legal and administrative mechanisms, to prevent harm and to protect the environment, including heavy fines for the wrongdoers. Standards and limits on greenhouse gas emissions for industrial activity are also applicable. Therefore, if the activity fails to comply with greenhouse gas monitoring conditions, the wrongdoer may be subject to administrative penalties for non-compliance with conditions established in the environmental license, such as warnings, fines ranging from 500 to 10 million reais and even embargoes on the activity, depending on the seriousness of the infraction.

⁵² KILPATRICK, Ryan. Norway has threatened to cut funds to Brazil unless deforestation slows. Time. June 23, 2017 Available at <http://time.com/4829820/norway-brazil-amazon-deforestation/> Accessed in September, 11, 2018.

⁵³ Idem.

In regards to the Paris Agreement compliance by Brazil, Climate Action Track rated Brazilian NDC “insufficient,” meaning that its targets are not consistent with limiting warming to below 2°C and, instead, are consistent with warming between 2°C and 3°C, which means that if all countries followed Brazil’s approach, global warming would reach over 2°C to 3°C. In addition, Brazilian policymakers and government seem not to be committed to the goals that aimed to reduce its emissions, and therefore, the greenhouse effect in the World. Recent developments in energy infrastructure planning and the above discussed reversal of deforestation policies are evidence of a worsening of Brazil’s national climate policy implementation – going in the opposite direction from what is needed to achieve the well below 2° C target.

Many actions and efforts had already proven to be efficient to protect the environment and to fight climate change. Unfortunately, weak governance led to many setbacks in the protection of the environment in Brazil that must be reconsidered. There are many gaps that still have to be implemented in order to achieve Paris’ goals and, therefore, the general elections for President, Congress and State Governors, to be held in October 2018, will be decisive for the overcoming (or not) of the Brazilian political crisis and for the course of environmental governance.

Local environmental agencies are expected to be the relevant actors to inspect and to control the reduction of carbon emissions. Civil society, NGO’s, international and national agencies, policymakers and scholars play a significant role in the implementation and strengthening of the Brazilian NDC.

As stated above, one of the key factors for the success of Brazilian’s NDC will be strong environmental governance, the necessary review of the National Policy on Climate Change in light of the Paris Agreement, as well as the full implementation of the Forest Code, in the forthcoming years.

In conclusion, Brazil increases its climatic delinquency year by year. By doing so, in practice, is Brazil withdrawing its commitment from the Paris Agreement? How can the Parties force Brazil (and other countries) to deliver the results?

The Paris Agreement is a legally binding instrument in International Legal System but implementation and compliance of targets in the Climate

Change Regime will only be real and effective when strong policies are taken by any given Government in its domestic legislation and policies, committed to make environmental protection a priority.

This piece of work shows that there are many gaps in literature, in the legal system and yet, a lot to be investigated. There is much more to be studied than the objectives proposed here, such as: sanctions, accountability, “power of embarrassment”, lobby and effectiveness of the mechanisms and implementation of the Paris Agreement, that will reflect the future of the Climate Change Regime. Due to the nature and extent of this research it did not aimed to tackle the future of the International Environmental Law, neither how the world will force Brazil to comply with its commitments. Although very interesting, it was not the approach of this study, having said that, we recommend the topic as an opportunity for future research.

References

ANDRADE, Rodrigo de Oliveira. Brazil on track for costly failure on climate targets. *Sci Dev Net*. 27/07/18. Available at <https://www.scidev.net/global/environment/news/brazil-on-track-for-costly-failure-on-climate-targets.html>. Accessed on September 7 2018.

BODANSKY, Daniel. The Paris Climate Change Agreement: A New Hope? *American Journal of International Law*. The American Society of International Law; J. 288. April, 2016.

BODANSKY, Daniel. The Legal Character of the Paris Agreement. *RECIEL*. Volume 25. Special Issue: The Paris Agreement July 2016. Pages 142-150.

BRASIL. Decreto Federal n. 8.972 de 23 de Janeiro de 2017 (2017). Available at http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/decreto/D8972.htm. Accessed in September, 2018.

CLIMATE ACTION TRACKER. Effect of Current Pledges and Policies on Global Temperature Available at <http://climateactiontracker.org/global.html>. Accessed on September, 07, 2018.

CLIMATE ACTION TRACKER. Brazil. Overview. Available at <https://climateactiontracker.org/countries/brazil/>. Accessed in September, 2018.

CLIMATE HOME. Brazil halves environment budget amid rising Amazon deforestation. Climate Home. Climate change news. April 21, 2017. Available at <http://www.climatechangenews.com/2017/04/03/brazil-halves-environment-budget-amid-rising-amazon-deforestation/>. Accessed in September, 2018.

CLIMATE HOME. Brazil's Temer extends amnesty to Amazon land-grabbers. Climate Home – climate change news. July, 2017. Available at <http://www.climatechangenews.com/2017/07/17/brazils-temer-extends-amnesty-amazon-land-grabbers/>. Accessed in September, 2018.

CUNHA, F. A. F. S., BÖRNER, J., WUNDER, S., COSENZA, C. A. N., LUCENA, A. The implementation costs of forest conservation policies in Brazil. *Ecological economics*. 130, 209-220 (2016).

CROUZEILLES, Renato; FELTRAN-BARBIERI, Rafael, FERREIRA, Mariana S.; STRASSBURG, Bernardo B. N.. Hard times for the Brazilian environment. (2017). *Nature Ecology & Evolution*. Doi 1. 10.1038/s41559-017-0303-7 Available at: https://www.researchgate.net/publication/319017012_Hard_times_for_the_Brazilian_environment. Accessed on September 06 2018.

ESTADO DE SÃO PAULO. Corte no orçamento do Inpe ameaça satélites e monitoramento da Amazônia – PROCLIMA – Programa Estadual de Mudanças Climáticas do Estado de São Paulo (2017). Available at <http://cetesb.sp.gov.br/proclima/2017/11/25/corte-no-orcamento-do-inpe-ameaca-satelites-e-monitoramento-da-amazonia/>. Accessed in September, 2018.

FEDERATIVE REPUBLIC OF BRAZIL INTENDED NATIONALLY DETERMINED CONTRIBUTION. Available at <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Brazil/1/BRAZIL%20iNDC%20english%20FINAL.pdf>. Accessed on September 7, 2018.

GARCIA, Lina Pimentel; BEZERRA, Luiz Gustavo. The Environment and Climate Change Law Review. On line. Edition 2. BRAZIL. Fevereiro, 2018. Available at <https://thelawreviews.co.uk/edition/the-environment-and-climate-change-law-review-edition-2/1153044/brazil>. Accessed in September, 2018.

INPE. Instituto Nacional de Pesquisas Espaciais. Taxas anuais do desmatamento: 1988 até 2016. Available at <http://www.obt.inpe.br/OBT/noticias/INPE-estima-desmatamento-por-corte-raso-na-Amazonia-em-2017>. Accessed in September, 2018.

KILPATRICK, Ryan. Norway has threatened to cut funds to Brazil unless deforestation slows. *Time*. June 23, 2017 Available at <http://time.com/4829820/norway-brazil-amazon-deforestation/>. Accessed in Sept, 11, 2018.

MAPBIOMAS PROJECT. Collection 2 of annual series of land cover and land use in Brazil, 2000–2016. Available at <http://mapbiomas.org/map#transitions>. Accessed in September, 2018.

MINISTRY OF SCIENCE, TECHNOLOGY, INNOVATIONS AND COMMUNICATIONS. SIRENE. System of National Emissions Registration. Available at http://sirene.mcti.gov.br/documents/1686653/1706227/4ed_ESTIMATIVAS_ANUAIS_WEB.pdf/a4376a93-c80e-4d9f-9ad2-1033649f9f93. Accessed in September, 2018.

OBSERVATORIO DO CLIMA. Avanço da soja em áreas de desmatamento na Amazônia é o maior em cinco anos (2018). Available at <http://www.observatoriodoclima.eco.br/avanco-da-soja-em-areas-de-desmatamento-na-amazonia-e-o-maior-em-cinco-anos/>. Accessed in September, 2018.

OBSERVATORIO DO CLIMA. Desmatamento sobe 29%, o maior em 8 anos. Available at <http://www.observatoriodoclima.eco.br/desmatamento-sobe-29-o-maior-em-8-anos/>. Accessed September, 2018.

OBSERVATORIO DO CLIMA. Desmate no cerrado anula ganhos na Amazônia. Available at <http://www.observatoriodoclima.eco.br/en/desmate-no-cerrado-anula-ganhos-na-amazonia/>. Accessed in September, 2018.

PRODES. (2017). Taxas anuais de desmatamento na Amazônia Legal Brasileira (AMZ). Available at <http://www.obt.inpe.br/prodes/dashboard/prodes-rates.html>. Accessed in September, 2018.

ROCHEDO, Pedro R. R., SOARES FILHO, Britaldo; VIOLA, Eduardo (et al). The threat of political bargaining to climate mitigation in Brazil. *Nature Climate Change*. Volume 8, pages 695-698, 2018.

ROCHEDO, Pedro R. R., SOARES FILHO, Britaldo; VIOLA, Eduardo (et al). The threat of political bargaining to climate mitigation in Brazil. Supplementary Online Material. *Nature Climate Change*. Available at: https://static-content.springer.com/esm/art%3A10.1038%2Fs41558-018-0213-y/MediaObjects/41558_2018_213_MOESM1_ESM.pdf. Accessed in September, 2018.

ROBERTS, David. The conceptual breakthrough behind the Paris climate treaty. *Vox* (2015). Available at: <https://www.vox.com/2015/12/15/10172238/paris-climate-treaty-conceptual-breakthrough>. Accessed in September, 2018.

SPERANZA, Juliana; ROMEIRO, Viviane; FEDER, Franklin Feder. WORLD RESOURCE INSTITUTE. Will Brazil Meet Its Climate Targets? July 07, 2017. Available at <https://www.wri.org/blog/2017/07/will-brazil-meet-its-climate-targets>. Accessed in September, 2018.

SZKLO, Alexandre; SCHAEFFER, Roberto. Behind the paper. The threat of political bargaining to climate mitigation in Brazil. *Social Sciences Nature*. Sep 03, 2018. Available at <https://socialsciences.nature.com/users/176276-robertoschaeffer/posts/38384-the-threat-of-political-bargaining-to-climate-mitigation-in-brazil>. Accessed on September 11, 2018.

UNITED NATIONS. Climate Change. Land Use, Land-Use Change and Forestry (LULUCF) Available at: <https://unfccc.int/topics/land-use/workstreams/land-use—land-use-change-and-forestry-lulucf>. Accessed in September, 2018.

VOIGT, Christina. The Universal Climate Agreement is Historic. Available at <https://www.jus.uio.no/ior/english/research/news-and-events/news/2015/2015-12-22-voigt-climate.html>. Accessed on September 4, 2018.

WORLD RESOURCES INSTITUTE. Climate Data Explorer (2016). Available at <http://cait.wri.org/>. Accessed in September, 2018.

WWF Global. Brazil. Available at http://wwf.panda.org/wwf_offices/brazil/about_brazil/. Accessed in September, 2018.