

Amazonian policy and politics, 2003-13: deforestation, hydropower and biofuels

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■ Executive summary

In the period 2003-13 Brazil experienced important economic and political developments: it became a much more relevant international player; its economy entered the world's top ten; and society became more politically active and expressed its complaints more aggressively. Amazonian policy and the politics of the period developed in this context, and three issues played a central role. Firstly, a cutback in deforestation led to a decrease in Brazil's carbon emissions by around one-third, which is a unique situation in the world. Secondly, despite the region's hydropower potential, projects developed slowly due to new environmental requirements and societal opposition. Thirdly, the production of biofuels was greatly encouraged by the introduction of flexible-fuel vehicles technology, but lost momentum after the discovery of offshore oil reserves; and there was a heated debate about the relationship between the expansion of sugar-cane plantations and deforestation after the decline in deforestation demonstrated that such plantations were not its main cause. Analysis indicates that there were three trends in Amazonian environmental policy and politics during the decade: continuity of former policies (2003-05), an upward trend towards sustainability (2005-10) and a downward trend (2010-13). The results of the 2014 elections are key to predicting future developments.

Introduction

Amazonian policy and politics from 2003 to 2013 should be seen in the larger context of Brazil's recent economic and political developments and their consequences for the country's international status.

In this period Brazil became a more relevant international player. Economic growth averaged 3.6% per year, compared to 2.8% during the previous decade,¹ and there was significant redistribution of income.² Economic growth was a product of three factors: significant changes in international commodity prices (commodities are key Brazilian exports); the effects of the pro-market macroeconomic reforms introduced in the second half of the 1990s; and high rates of foreign direct investment (FDI). Income redistribution was initiated during the Cardoso administration (1995-2002) and was deepened by the socioeconomic policies of the Lula da Silva administration (2003-10). The virtuous cycle of high economic growth ended in about 2010. The Lula administra-

tion did not continue the macroeconomic reforms started in the 1990s and the consequences of the lack of pension, labour, fiscal, tax and political system reforms started to be felt during the Rousseff administration (2011-continuing). Economic growth declined to 2% a year; inflation was always significantly above the target defined by the Central Bank; and the FDI rate declined due to the global economic crisis and the uncertainty caused by federal government intervention in the economy. Tackling inequality became more difficult with lower growth rates and higher inflation.

The effects of a stronger economy were also felt politically. A powerful and competitive media industry and a more engaged society were more aware of corruption – which was actually lower during this decade compared to previous ones, but there was much more information about it. Brazilian courts showed a level of independence rare in non-Organisation for Economic Cooperation and Development (OECD) countries: key individuals from the first Lula

1 Gross domestic product growth, data from World Bank, 1993-2002 and 2003-12, <<http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?page=4>>.

2 Brazil's Gini coefficient shifted from 58.78 in 2003 to 54.7 in 2009. Data from World Bank, <<http://data.worldbank.org/indicator/SI.POV.GINI>>.

administration (except the former president himself) were convicted of corruption in 2012. In June 2013 massive demonstrations against corruption and the state of transportation, education, and health care surprised political actors and analysts.

The Amazonian policy and politics of the period were characterised by three key issues. Firstly, the cutback in deforestation during the decade led to a decrease in Brazil's carbon emissions by around one-third – a unique situation in the world. Secondly, the region has important hydropower potential, but development was slow because of new environmental requirements. Thirdly, the production of biofuels, especially ethanol, was greatly encouraged after the development of flexible-fuel vehicles technology, but lost momentum after the discovery – and overestimation of the potential – of deep sea offshore oil reserves. By analysing the evolution of these three issues, it is possible to conclude that there were three different trends in Amazonian environmental policy and politics during the decade, and that the results of the 2014 elections are key to predicting further developments in this regard.

Reduction of deforestation: the recent driver of Amazonian politics in Brazil

Brazil's greenhouse gas (GHG) emissions profile has been historically different from that of most other countries. Due to its relatively low carbon energy matrix (46% of its total primary energy production and 42.4% of its total primary energy supply³ come from low-carbon sources), land use, land use change and forestry (LULUCF) have traditionally been the major drivers of Brazil's emissions. Deforestation – clearing native forests in order to sell the wood and raise cattle – is a relevant issue in various parts of Brazil, including the Amazon region.

Deforestation has driven the colonisation around the Amazon forest, but its intensity is changing. Until the middle of the 20th century, when settlements were mostly spontaneous or a strategy to defend the country's borders from foreign invasion, deforestation was not a concern. The situation changed in the 1970s when the military governments, besides promoting the occupation of the region in order to keep the territory securely under national sovereignty, encouraged both migration to the area, so to avoid land reform in other highly populated parts of the country, and also the use of the land to produce commodities, in order to improve the balance of payments. Official policy included the construction of highways, fiscal and financial incentives to clear the forest for crops and livestock, and other subsidies (Carvalho, 2012). In the second half of the 1980s, when debates on sustainable development came onto the

international agenda and Amazon deforestation was under the spotlight, the first national measures to tackle it were introduced.

It was not until the second half of the 2000s that deforestation was reduced. During the period in which Marina Silva (2003-08) and Carlos Minc (2008-10) were ministers of the environment, deforestation decreased from 27,000 km² in 2004 to 7,500 km² in 2009.⁴ The cutback was due to legal and institutional changes:⁵ political priority was given to the issue; law enforcement and institutional capacity was enhanced; coalitions by multi-stakeholders against the consumption of soy beans and beef produced in deforested areas were formed; the influence of NGOs and the scientific community on the media increased; new and extensive national parks and conservation units were created; and cooperation between state and national governments was boosted (Viola, 2013; Viola & Franchini, 2013). The year 2009 can be considered the high point of the reduction of deforestation because outcomes from specific policies were coupled with the effects of the financial crisis, which decreased agribusiness commodities prices, reducing the incentives to deforest.

2009 brought other changes. Following the greater attention given to climate change by the media and the public due to expectations of good results at the Copenhagen Climate Change Conference (COP 15), the federal government was pressured by the Amazon-region state governments to change its international position regarding forests: they demanded that the country accept the inclusion of REDD+⁶ into the Clean Development Mechanism or any other market mechanism. This and other requests from corporate coalitions – accepting market mechanisms for negotiating avoided deforestation, decelerating emissions and committing to emissions reduction until 2020 – helped in shaping the Brazilian pledge made in Copenhagen, i.e. a voluntary commitment to reduce the expected 2020 (according to a business-as-usual scenario) GHG emissions by 36-39%. The pledge was a substantial change from the previous unwillingness of the Brazilian government to accept emissions targets. It was incorporated into the National Climate Change Policy, the first issued by a non-OECD country, in which measures for the Amazon region – the Plan of Action to Prevent and Control Deforestation of the Legal Amazon – deepened earlier policies. Despite some remaining enforcement issues its results have been significant, especially when compared to the measures envisaged for other sectors/regions, which have been much less successfully implemented.

In 2010 LULUCF was no longer the main source of Brazilian GHG emissions. The year marks a new upward trend in

3 Excluding and including energy imports, respectively. 2012 data from EPE (2013: 21-22).

4 Annual averages. Data from the National Institute of Spatial Research (INPE), <<http://www.obt.inpe.br/prodes/index.php>>. In the first two years of Da Silva's tenure (2003-04) there was a dramatic increase in deforestation.

5 In 1996 the old Forest Code (enacted in 1965) was changed to make compulsory the preservation of 80% of the vegetation in the Amazon region; in 2006 the Act on the Management of Public Forests created the Brazilian Forest Service in order to manage the forests.

6 The full title of REDD is the UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries.

national emissions, which was induced by the effects of enhanced economic development. Whereas LULUCF was responsible for approximately 57% of total emissions in 2005, its share was approximately 23% in 2010, while emissions from other sectors – energy, agribusiness, industry, transportation and waste treatment – had increased (Brazil, 2010; 2013). The current Brazilian GHG emissions profile shares more features with those of industrialised countries; climate change mitigation, once a by-product of deforestation policies, now requires action in other sectors for it to be achieved (Viola & Franchini, 2013).

From 2010 to 2012 deforestation continued to be reduced (reaching its greatest extent in 2012), but more slowly. In 2013 there was a 25% increase in deforestation. The reasons for the deceleration were mainly political: in 2010 the special commission on the reform of the Forest Code had several important meetings and presented a preliminary version of the new code that would alter the nature of the law. In fact, the new Forest Code, enacted in 2012, is a step backward in tackling deforestation: by granting amnesty to deforestation, instead of pushing for the restoration and use of degraded areas in agribusiness, it responds to short-term private interests to enlarge the size of grazing and cropping areas, deepening the problem.

A new hydropower model for the Amazon region?

Hydropower is the main source of Brazil's electricity. In 2012, 70.1% of Brazil's electricity production and 76.9% of its electricity supply⁷ came from hydropower. Relying on hydropower for electricity generation was a decision taken by the Brazilian government in the 1970s, boosted by energy security concerns in the context of world oil crises. The country has one of the world's greatest hydropower potentials, but most of its southern river basins have

already been explored: 70% of its remaining potential is located in the Amazon basin.⁸

Most of Brazil's hydropower plants were built during the 1970s and 1980s, when lower environmental standards were in force. The law has changed substantially: during the 1990s-2000s it became much more difficult to obtain a licence to build a new hydropower plant and many of the projected ones had their construction postponed or disrupted due to further environmental demands. It was mainly after the 2001 blackouts⁹ that the federal government resumed efforts to build new plants, some of them in the Amazon region – but not without controversy, however.

From 2007 to 2013 two hydropower plants were built on the Madeira River (a major tributary of the Amazon): Jirau and Santo Antonio. Both employ run-of-the-river technology, which allows for smaller dams to be created. This technology is considered to diminish the impacts of hydropower on the environment¹⁰ – especially on biodiversity – but the results obtained are thus far unclear.

In fact, run-of-the-river technology is a product of negotiations between environmentalists and defenders of development at all costs. For hydropower to be efficient, the amount of water that passes through the turbines must remain constant over time. River flows change over the year, so either dams or back-up systems must be built to maintain stable electricity production. The Amazonian rivers experience great hydrological variation over the seasons; by applying run-of-the-river technology in the basin, the choice of back-up systems becomes ever more relevant – and, sadly, in recent years this role has been played by fossil fuel thermal power plants. Therefore, when the aggregate impacts – impacts from the plant plus the back-up system – are taken into account, it is not straightforward that a run-of-the-river hydropower plant in the

Table 1: Annual deforestation in Brazil's Legal Amazon (km²)

State	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Variation in 2013	Variation 2004-13
Acre	728	592	398	184	254	167	259	280	305	199	-35%	-73%
Amazonas	1,232	755	788	610	604	405	595	502	523	562	7%	-54%
Ampá	46	33	30	39	100	70	53	66	27	11	-59%	-76%
Maranhã	755	922	674	631	1,271	828	712	396	269	382	42%	-49%
Mato Grosso	11,814	7,145	4,333	2,678	3,258	1,049	871	1,120	757	1,149	52%	-90%
Pará	8,870	5,899	5,659	5,526	5,607	4,281	3,770	3,008	1,741	2,379	37%	-73%
Rondônia	3,858	3,244	2,049	1,611	1,136	482	435	865	773	933	21%	-76%
Roraima	311	133	231	309	574	121	256	141	124	185	49%	-41%
Tocantins	158	271	124	63	107	61	49	40	52	43	-17%	-73%
Amazônia Legal	27,772	19,014	14,286	11,651	12,911	7,464	7,000	6,418	4,571	5,843	28%	-79%

Source: INPE, PRODES Project, <<http://www.obt.inpe.br/prodes/index.php>>

7 Excluding and including electricity imports, respectively (EPE, 2013: 16).

8 According to official data, the rivers of the Amazon basin have 34,000 MW of unexplored hydropower potential (Eletrobras, 2012).

9 In 2001 Brazil experienced a series of blackouts after droughts reduced the level of key dams; the government was forced to ration electricity.

10 From the many works on environmental impacts of dams, three international guidelines are especially recommended: WCD (2000); IHA (2004); IEA (2004/2010).

Amazon region would cause less environmental impact than a hydropower plant with a large reservoir built in the same or another region of the country. By understanding the externalities of producing electricity production from a variety of sources, Brazilian society is engaging in a deep debate that, it is hoped, will truly balance economic efficiency and environmental protection.

The Belo Monte hydropower plant, under construction on the Xingu River (another major tributary of the Amazon), is a controversial project. First attempts at implementation – in which the building of a large dam was included – date from the second half of the 1980s, but failed due to both strong opposition from environmentalists and indigenous people and the fiscal collapse of the Brazilian state. In the second half of the 2000s the project was redesigned to apply run-of-the-river technology. In 2010 the construction contract was signed and in 2011 the environmental licence was issued. Construction is progressing; it has, however, faced several legal battles, including disputes between the Brazilian federal state and the Inter-American Court of Justice (IACJ).¹¹ Public opinion is mostly against the project, not only due to its environmental impacts, but also because of its effects on indigenous populations. The hydropower projects on the Tapajós River (another tributary of the Amazon) face the same controversy: they could potentially increase hydropower production, but at the cost of serious impacts on biodiversity and the local population.

Recently the federal government has changed some environmental laws in order to allow the construction of new hydropower plants in the Amazon region. In 2011 the borders of several national parks and national forests were modified – e.g. Amazônia, Campos Amazônicos, Matinguari, Itaibuba I and II, Crepori, and Tapajós – and areas that might be flooded by hydropower projects no longer had to be preserved (Brazil, 2012). The government is also postponing demarcation of indigenous lands – a potential reaction against native populations' demands to be consulted about hydropower projects if they are to be built on land these populations historically occupied. On several occasions in 2013 the native population from the Tapajós River area demanded prompt action from government officials regarding this matter.

Among the alternatives to avoid the stricter Brazilian environmental requirements for hydropower projects, new hydropower plants are being constructed in Peru to export electricity to Brazil. In 2010 Brazil and Peru signed the Energy Agreement (Brazil & Peru, 2010), which planned the construction of six hydropower plants in the Peruvian Amazon. The plants will be built with Brazilian capital (both private and public); the electricity produced will supply the Peruvian market, but the surplus will be exported to Brazil; and after thirty years the ownership of the plants will revert

to Peru. This initiative is also highly controversial: many Peruvians argue that the country has become prey to Brazilian imperialism, since there is a misbalance between the significant social and environmental impacts of the hydropower plants on local communities and their small benefit for the Peruvian population, whose energy demand is low and could be met without the new projects. Peruvian indigenous populations are challenging the agreement by arguing they should have been consulted before its signing, since their interests are at stake. The treaty is not yet in force and its ratification has been delayed, although some of the projects are in advanced stages of planning.

The development of biofuels

Brazil is traditionally a producer of ethanol from sugar cane. The high prices of oil during the 1970s crises and energy security factors played an important role in encouraging ethanol's use as fuel – back then, sustainability issues were absent. Due to Brazilian government incentives and subsidies, large sugar-cane plantations were established, mainly in São Paulo and Pernambuco states. In the 1990s, due to a severe supply crisis, ethanol's role as a biofuel faded; it came back into the spotlight in 2003 after the development of flexible-fuel vehicles technology.

Brazilian ethanol from sugar cane is the world's most efficient biofuel employed on a large scale: it is two to three times more efficient than ethanol from corn (Goldemberg, 2008). Brazil has industrialised the production and distribution of ethanol and has exported its know-how to several countries, such as Colombia, El Salvador, Honduras, Argentina and some African countries.

It is important to note that Brazilian sugar-cane production is currently concentrated in São Paulo state and surrounding areas, and there is no plan to expand it to the Amazon region (Goldemberg, 2008). However, the expansion of sugar-cane production in these areas, especially between 2000 and 2005, has pushed north to the centre-west of the country and to the Amazon region in the form of cattle grazing and soybean plantations. Therefore, even if sugar-cane plantations cannot be directly blamed for the increase in deforestation in the tropical forest, they could be partly and indirectly blamed for it – although it would be an exaggeration to say that they were its main driver.

The freight sector in Brazil employs mostly diesel, with 5% biodiesel content (there is no pure biodiesel in Brazil). In recent years the production of biodiesel has contributed to deforestation in the Amazon, especially because soybeans are still the main source of Brazilian biodiesel. Nevertheless, the share of soybeans employed in biodiesel production is almost insignificant when compared with the amount exported for human and animal consumption,

¹¹ In 2011, following a claim by NGOs that the Belo Monte project potentially had several social and environmental impacts not covered by the environmental licensing in process, the IACJ requested Brazil to suspend the licensing process. The request came after the Brazilian government had responded to several interventions of the court on the same issue, and was not welcomed. Relations between the country and the IACJ deteriorated and on occasions Brazil supported the Venezuelan, Ecuadorian and Bolivian pledge to limit the court's powers regarding interventions on human rights issues.

so biodiesel cannot be blamed for the recent wave of deforestation. The situation could change if the federal government's predicted incentives and subsidies to biodiesel production materialise.

From 2005 to 2007 ethanol played an important role in Brazilian diplomacy. Brazil advocated the creation of a global biofuels market and tried to make an international commodity out of ethanol, exporting technology and establishing partnerships to develop ethanol markets in several countries. This platform, which suited Brazilian national interest, but differed from the positions of China, India and Indonesia – Brazil's allies in climate change negotiations – did not last: by the time the deep sea offshore oil was discovered, ethanol as an issue vanished from official Brazilian speeches.

Until 2006 the domestic prices of oil and derivatives followed international prices; after the discovery of the offshore reserves the illusion that Brazil would rapidly become a great producer and exporter of oil misled the federal government into using the domestic prices of oil and derivatives as heterodox economic tools. In 2007, following the increase of international prices, the Brazilian government decided to subsidise fossil fuels to maintain high economic growth rates, a strategy that changed the relative prices of gasoline and ethanol and undermined the competitiveness of the latter. After the collapse of Lehman Brothers in 2008 large tax exemptions for the automobile industry led to a dramatic increase in demand for fuel, while ethanol prices were still not competitive. The heterodox policy might have benefitted the Brazilian economy in some ways, but it penalised both Petrobras (the semi-public Brazilian energy company) – which experienced several important losses – and the ethanol production chain. After the shale gas revolution in the U.S., enthusiasm for offshore oil reached its lowest point and there were some small changes in the relative prices of gasoline and ethanol, but not enough to change the current situation, however.

Conclusion

From 2003 to 2013 three different trends can be identified in Amazonian policy and politics that reflect the importance given to the environmental agenda in Brazil.

In the first two years of the Lula administration there were no changes in practices from the Cardoso era. Efforts to fight Amazon deforestation were sluggish; no hydropower plants were built, while fossil fuel thermal power plant electricity production increased; and flexible-fuel vehicles were not yet popular, limiting the use of ethanol as a fuel.

From 2005 to 2010 change took place: during the tenures of Marina Silva and Carlos Minc at the Ministry of the Environment, deforestation was fought much more energetically – a true rupture from earlier policy and politics. New hydropower plants started to be built in the Amazon region,

after agreement to apply run-of-the-river technology had been achieved and Brazil's fiscal situation had improved. Ethanol was extensively included in Brazilian foreign policy during President Lula's mandate. It is correct to say that during this period compromise was reached between environmentalists and defenders of development at all costs.

At the end of Lula's mandate and during President Rousseff's ongoing administration, a new trend could be observed regarding deforestation and biofuels: there was clearly more direct confrontation with environmentalists, reversing some long-term achievements, e.g. the terms of the new Forest Code, the continuation and deepening of subsidies to fossil fuels (reducing the incentives to use ethanol), and disillusion with offshore oil reserves. Regarding hydropower, however, the government was less able to accelerate the construction of new plants in the Amazon region: societal opposition to these projects is spreading and remains very strong.

It is difficult to predict how Amazonian policy and politics will develop from 2014 onwards. On the one hand, foreign and national economic agents are almost as concerned about Brazil's current economy situation as they were before 2003. It is clear that without consistent tax, pension, labour, fiscal and political system reforms no new system of governance will emerge and it will be difficult for Brazil's economy to match its potential.

On the other hand, it is difficult to predict whether the public political demonstrations of 2013 will translate into real changes in the composition of the federal government after the 2014 elections. If the present coalition wins the elections, the status quo will likely be maintained and reforms will likely be further postponed, worsening Brazil's economic situation. If the opposition wins the elections, it will face major challenges if it attempts to change the present scenario.

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