

# Energy Policy and Forest Sustainability: A Reflection on the New Brazilian Forest Code

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**Abstract** - The world energy market has been suffering some modifications with the emergence of new energy resources as bio-fuels. In this context, Brazil has been proving to have the ability to produce enough ethanol derived from sugarcane through its huge territory and fertile soil, what enables the country to control a big share of the energy supply and to take the major role from other important energy producers. But, a considerable change in the use of the soil is required, being the major one the expansion of lands that leads to deforestation in Amazonia. All over the last two years, important changes were discussed and made in the Brazilian forest regulation. Our study consists on the explanation of what we think are the true and fundamental reasons for reviewing the Brazilian Forest Code; how sustainable are these changes and who will benefit from.

**Keywords** – Energy, Forest Sustainability, Forest Code.

## 1. Introduction

Changes in the Brazilian Forest Code have been discussed all over the next two years. Our focus is to connect this evolution with international exchanges, especially regarding the energy industry.

The world energy market has been suffering some modifications with the emergence of new energy resources, as bio-fuels. Through its huge and fertile soil, Brazil has been proving to have the ability to produce a large ethanol derived from sugarcane at a large scale. That, enables the country to control a big share of the world energy supply and take the major role of international energy policy to others important energy producers. Unfortunately, a considerable change in the use of the soil is required, the major one being the expansion of lands that leads to deforestation, so Brazil can be able to respond to this market increase.

Our study will consist on the explanation of what we think are the true and fundamental reasons for reviewing the Brazilian Forest Code. How sustainable will these changes be and who will benefit from?

The structure of the paper is the following: In the first point we introduce the issues relating bio-fuels and new energy systems and, in the second point, the specific situation of Brazil, in terms of these new forms of energy production and use, is discussed. The point three takes the analysis of the Brazilian Forest Code and makes the balance of the changes that were introduced in the new legislation. The economical and environmental consequences are discussed. Finally, these changes are critically reviewed and a special attention is given to the new features that were introduced in the last year, after the new Code was approved.

## 2. The Challenge of Renewable Energies: The Bio-Fuel Case

Nowadays, there are many different externalities that affect oil consumers' preferences, directly or indirectly. The price of oil had a notable increase during the past last years. Its instability makes one think about different sources of energy, other than oil. This tendency is followed by an increase of ecologic consciousness that affects demand, and therefore, also affects supply. According to BP (British Petroleum) data, search for oil has been diminishing every year for the last ten years. At the same time, renewable energy markets have been increasing.

After Kyoto's Protocol, 1997, and others world's conferences about preservation of the environment that followed it, the impacts of GEE's emissions in global warming and pollution in the

atmosphere have been the core of many discussions and debates. These concerns lead into international agreements and international rules based on the reduction of carbon dioxide emissions as well as other pollutants and GEEs. They also included economic incentives (as subsidies for the emission reduction and tariffs and fees on oil importation and use of others fossil fuels). Consequently, these measures imply the reduction of oil demand in favour of the development and use of alternative energies.

At first sight, these environmental policies seem fairer and more environment- friendly. But won't these changes in consumption affect the whole mechanism of energy production already existent? What about renewable energy sources, won't they have to be produced on a larger scale? Who will suffer from this changes, and how?

Renewable energies considered more environmental friendly, such as bio-diesel, bio-ethanol, palm oil and others, are obtained from plants and cereals like corn, sugarcane, palm and many others. In some parts of the planet each of these are considered staples. With the renewable energies market expansion, demand for agricultural products will tend to rise. And if the ambitious goals for 2022 and 2050 are ever going to take place, this growth will not be modest. To have an idea, 1 litre of ethanol equals to two thirds of a litter of gasoline, in energetic terms. So it is necessary to produce one third more ethanol to get the same result as with gasoline. Further, for each quantity of input of corn used in the U.S, they get 1.5 of output (bio-ethanol made by corn).

Now that we have this information, we can assume two possibilities for the future of this industry development. First, if crop areas in the world do not enlarge, the results will be reflected in the increase of food prices. Products that once were destined to feed the population, as final goods, are now considered intermediate goods for bio-fuels production. As a result, the quantity of cultivated food offered in supermarkets will be reduced and so their real prices will rise.

On the other hand, crop areas could be extended and so we would have new energies' feedstock. That way, the amount of food offered would not have to be affected and we would still have enough to produce bio-fuels. Instead, it is the value of lands that will increase, as well as deforestation and its consequences.

Stimulating the production of bio-fuel has been at the centre of some of the latest environmental courses of actions. Self-sufficiency is a key-factor for the growth of a country, so, the developed and developing countries are most interested candidates to invest in this field. The domestic production of alternative energies as substitutes for fossil fuels, which have high production costs and high final price, leads to a reduction of imports and of dependence from politically unstable countries.

Acquiring energy independence from providers in these politically unstable countries was one of the main reasons that led the United States to expand in this industry. In 2007, the production of corn from the U.S. accounted for 40% of world production and 55-60% of international trade. Thus, the U.S. had an enormous influence on the international price of corn. When it began specializing in the production of corn-based ethanol, the price of grain tended to increase as their demand for energy. The impact on the price increase was also resented by the household consumption.

With the steady increase in the price of fossil fuel, the domestic industry of bio-ethanol increased too. Furthermore, the dedicated areas to the cultivation of soybeans, as well as other cereals, suffered with this growth having their areas of cultivation reduced to make room for cornfields, thus creating a change in American cultures. Faced with this policy, two opposing streams emerged:

- Farmers and industry supporters, who have seen their revenues increase, and senators, who noted a reduced dependence on oil imports;

- Environmentalists, defending that there is a limitation on the supply side due to the restriction of potentially dedicated areas to the cultivation, provided by the "Conservation Reserve Program"<sup>1</sup>.

Another problem associated with the necessity of increasing the agricultural areas is the lack of productivity and inefficiency of the country compared to its competitors. As previously mentioned in this study, in the case of ethanol production, in the United States, for each input unit used is obtained 1.5 of output, which is very little taking into account that in Brazil, for each input unit

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<sup>1</sup> USDA (United States Department of Agriculture) definition of the Conservation Reserve Program (CRP): It is a voluntary program for agricultural landowners. Through CRP, one can receive annual rental payments and cost-share assistance to establish long-term, resource conservation covers on eligible farmland.

used is obtained 8 units of output. If the U.S. devoted all their cornfields to ethanol it would supply only 4% of its national energy demand.

Several factors have led Americans to realize that it would be much wiser to abolish subsidies for domestic production of corn ethanol, as well as taxes on imports. On December 31st of 2011, tariff barriers for bio-diesel and ethanol, from Brazil and the U.S. (the largest producers of ethanol in the world) were abolished allowing these two countries to trade with each other at the renewable energy markets' price.

Another important case to be analysed is that of China, because this country is the largest energy consumer in the world. In 2000, China was responsible for consuming 11% of the world energy, in 2010, they reached 20.3%. Despite this enormous demand for energy, China does not have the capacity to produce enough raw materials to generate renewable energy in order to meet their needs and, also, their basic food needs. Just to meet them, China would have to double or even triple their crops in some regions. However, this is not feasible due to topographical limitations of the country.

Another reason that also limits the possibility of extension of cultivated areas is the fact that large areas of marginal lands belong to the program "Grain for Green Program"<sup>2</sup> supported by the government. Not to be left behind in the race of green energy alternatives, China sets itself in search of alternatives to the production of raw material outside its borders, particularly in Brazil.

### **3. Development of Renewable Energy Industry in Brazil**

Brazil and the United States represent almost 90% of global production of ethanol. Brazil, along with Germany, France and Argentina, account for 10-14% of world's bio-diesel production. The weight of Brazil in this industry is due to the enormous demand for alternative fuels, particularly for the increase of purchasing efficient cars, and its huge competitive advantage, especially with regard to size and fertility of the soil in comparison with other producers.

So, there is a market demand on one side; and efficiency and productivity in the supply, on the other side, which seems to create a good balance. Given the size of its unexploited territory, Brazil has the capacity to expand its large-scale farming areas. As for productivity, the country has proven to have low production costs, and so being able to sell ethanol at competitive prices in order to meet domestic demand and even export. The production of ethanol distilled from sugar cane involves using less land and less fossil fuels than others energy fuels. All these factors promoted the integration of Brazilian energy industry in the international market letting it compete with fossil fuels.

Therefore, the Brazilian government adopted fiscal measures encouraging this growing industry, through tax incentives and subsidies. These measures, added to the country's climate that allows sugar cane to fit easily into different areas and so being produced in large scale, contributes to the growth of national economy. One third of the global sugarcane production is of Brazilian's responsibility. It represents 10% of the country's cultivated area, which means 5.6 thousand hectares. 54% of this sample accounts for 40% of national bio-fuel production for domestic demand.

Given the Brazilian success in this industry, is not expected that it will fall. Domestic demands and exportations of ethanol are expected to increase. This ambition is supported primarily by farmers expecting to increase their revenues. Besides, from the point of view of potential importers of alternative energy feedstock, this measure seems suitable: Brazil has a huge unexploited area of land and great facilities regarding agriculture.

Even though this approach seems to be a golden goose for Brazil and for the rest of the world, in large part, it is also a serious worldwide environmental issue. It is estimated that, in 2017, the Brazilian sugarcane area of cultivation will cover an additional 10 million hectares of fertile soil. At the same time, cattle pasture and other crops will move along with the deforestation of the Amazon, where it is more suitable for sugarcane plantation. It is expected that 40% of the Amazon will be deforested by 2050, due to this new needs.

<sup>2</sup> Grain for Green Program: Also known as Slope Land Conversion Program or The Conversion of Cropland to Forest and Grassland Program was launched in China as a national measure to control erosion and increase vegetation cover, in 1999. It features the conversion of steep-sloped and degraded cropland and barren land to forest and grassland by millions of small landholders in 25 provinces, municipalities and autonomous regions.

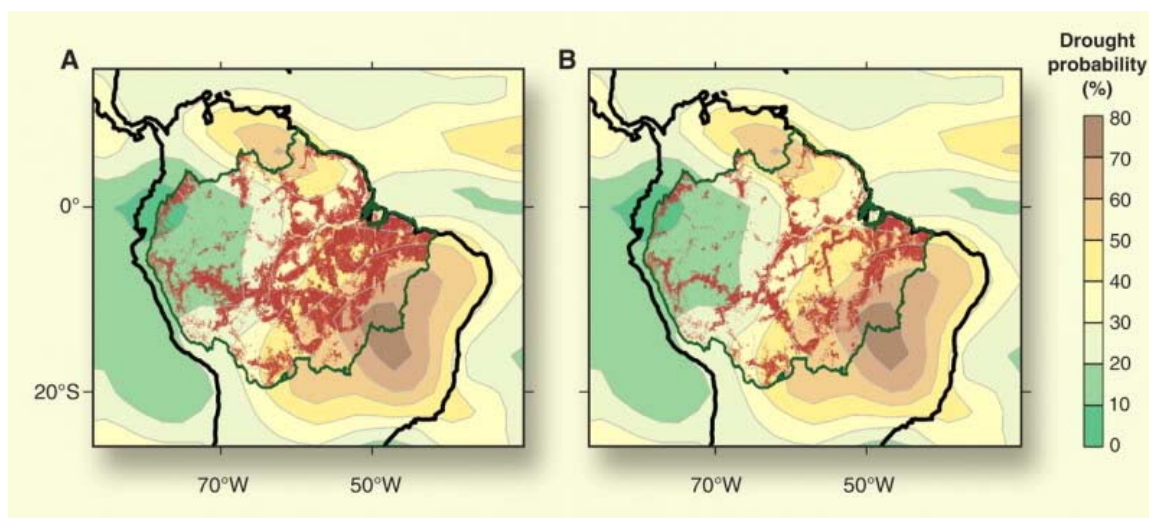


Figure 1. Two models of deforestation in 2050, under A) the current system and B) increased governance.

**Source: Blog Action Day: A Picture is Worth a Thousand Trees**

Given the need to preserve the Amazon, environmental groups, and others, alerted for a series of infrastructure projects planned for the next years that aim to move farmers into unexplored regions. These plans are followed by progressive changes in land use. The Midwest, and specially the state of Mato Grosso, suffer the most with these measures, due to the increasing movement to the north, during the past 30 years, with the purpose of cultivating.

The continuous growth of the deforestation makes us wonder about the Brazilian environmental policy and the protection of the world's largest rainforest. The government says that decision makers are developing the necessary measures to prevent this from happening, by fighting against illegalities and environmental crimes committed, responsible for a fifth of the Amazon lost forest, since 1970. That's where we meet the debate about forest conservation in Brazil and the associated discussion on the Brazilian Forest Code changes.

#### 4. The Brazilian Forest Code

The first Brazilian Forest Code was published in 1934 and it was still in use in the first decade of the new millennium. However, it has been subject to various changes, adapting to different requests throughout time. Several reasons lead to the need for the creation of the "Brazilian Forest Code", the main

one being the growing concern with the conservation of the ecosystems basic functions. In order to do so, a set of rules concerning land exploitation were created as well as boundaries regarding the maintenance of native vegetation and cropped areas.

Since then, Brazilian forests had been, supposedly, protected by law. But this did not turn out to be true. Different environmental crimes have been committed, such as illegal deforestation or non-official cutting of trees, all of them free of punishment. One of the most serious examples of "environmental chaos" was the construction of the Trans-Amazonas highway (BR230) inaugurated on August, 1972. Its purpose was to connect the north and northeast of Brazil to Peru and Ecuador. In order to reach its initial goal of building 8000 km of road, an enormous amount of areas had to be deforested. Nowadays, the only remains of it are a few passable stretches which led to Thomas Favaro's quote "The road that connects "nothing to nothing at all" is a scar in the middle of the jungle and a monument for the blindness of past generations and mud"<sup>3</sup>.

<sup>3</sup> "A estrada que liga o 'nada a coisa nenhuma' é uma cicatriz no meio da selva e um monumento à cegueira ambiental das gerações passadas e lama", FAVARO. T., 2009, 40 anos de poeira

The Brazilian Forest Code has recently being subject to yet more changes which generated conflicts between farmers, environmentalists and even the government. One of the suggested changes was that all the land-owners who have been fined for deforestation in the past could cancel the penalties by regulating their property through recovery of the Areas of Permanent Preservation (APPs) and Legal Reservations (re-plantation of the forest). On the other hand, some untouched land would be available for agriculture exploitation, following some rules. Such verdict is supposed to allow deforestation to keep happening in the future, even though its growth was mitigated during last years. We should then ask ourselves which would be the government motivations to allow this to happen.

The Amazon has approximately 7000 km<sup>2</sup> through Brazil and eight other countries, being the major part in Brazilian territory (state of Amazonas, Amapa, Rondonia, Acre, Pará and Roraima). Because of its biodiversity and magnitude, the Amazon has been called “the lung of the world”.

Since the Brazilian Forest Code had to be readjusted and taking into account the country's influence in world's agriculture, the relationship between environmentalists and farmers could not be friendly. The new code proposal was approved in the Senate, December 2011, with 59 votes against 7. Among the main important changes, the code suggested the following conservation tools:

- *Legal Reservation (LR)*

Preservation of native forest inside the property: 80% in Amazonia, 35% in Cerrado<sup>4</sup> and 20% in others regions, even though changes can be made with the Environmental National Board (Conselho Nacional do Meio Ambiente) authorization.

- *Permanent Preservation Areas (APPs)*

It was proposed a reduction from 30m to 15m of forest recovery in vulnerable locations such as river banks, top of hills and hillsides; which cannot be deforested, despite possible exceptions.

It, also, guaranteed, to all rural properties, the preservation of agro-forestry activities on riverbanks (as long as they were consolidated until 2008). And, allowed the use of APPs for some types of crops.

- *Conversion of fines*

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<sup>4</sup> Cerrado comprises 21% of Brazil territory. It is a vast tropical savannah eco-region of Brazil and contains some of almost in extinction species.

Rural producers that had been fined until July 2008 are now able to convert their fines by reforesting; big landowners that deforested until July 2008 also benefiting with this measure.

- *Small Farmers*

According to the Senate, small properties or family farm agriculture could keep the cultivation and other activities of low environmental impact in APPs and LR, as long as the property was registered in the Cadastro Ambiental Rural<sup>5</sup> (CAR).

CAR established a stated period of one year that may be prorogued only once for the same period, so that landowners could register their properties in that registry. The register will able to store environmental information about all rural properties. It will allow the control, monitoring, economic and environmental planning; and prevent deforestation.

- *Economic Incentives*

Environmental preservation will be insured by the enlargement of economic mechanism incentives. Objectives: preserving native forests, conserving scenic natural beauty and biodiversity, maintaining climate stability and keeping healthy the APPs and LR.

The government should establish a programme stimulating the preservation and environmental recover, within 180 days after the code's publication.

## 5. Critical Review

Analysing the global current energy scenario, one realises that alternative energies is an increasing important choice. Consumers are growing in ecologic consciousness as well as an awareness concerning Greenhouse gases (GHG) responsible for global warming, which are accentuated by disorganised deforestation. Bio-fuels are becoming one of the main answers for this line of enquiry in many developed countries, although some of them do not have the resources for producing them, which is not the case of Brazil. Having the largest Natural Reserve, the specific Brazilian situation implies that any changes in the Forest Code will inevitably have global consequences.

Given the above, certain questions should be raised concerning the new Brazilian Forest Code: how large a cultivated area is required to produce the bio-fuels? Will its expansion involve the conversion

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<sup>5</sup> Environmental Rural Registry

of tropical forest and humid areas? How would other countries benefit from the production of these bio-fuels on Brazilian soil? Of course, some fundamental issues still remain unsolved through the changes proposed in the new Brazilian Forest Code. How is it sustainable in the long run? What changes will occur on a regional scale affecting the Amazon basin and the soil? What changes will occur on the habitat of native species, biodiversity, air (through emissions of GEE) and water quality?

An expansion on bio-fuels' production not only requires a bigger share of Brazil's land to crop areas but also an important industrial development by increasing technology infrastructures. A greater number of sugar-mills will be required as distilleries. Yet, the construction of pipelines to transport bio-fuels from its storage and production areas (centre and south of Brazil) to Santos (the distributor port and outlet) is necessary (and it is being intended for some time...).

Changes made in the New Brazilian Forest Code, aims promoting the country's economic growth. This is in fact beneficial to farmers who see the possibility of increasing their cultivated areas, thus increasing their revenues.

But, disordered deforestation in Brazilian forests has been occurring drastically for over 50 years, in order to respond to such political and economic factors. It must be clear, that this has been occurring long before the use of bio-fuels. But this new energy policy trend seems to favour this obnoxious development.

Last year, 2012, a profound debate was made in the most important fora in Brazil political circuits. The central problem relied on identified gaps along with Brazilian politics situation. Although having been voted in the House of Representatives and in the Senate, the text of the new Code should be re-voted in the Chamber of Deputies in March 2012 because its wording was changed in the Senate. And, most important, President Dilma Rousseff could have the veto possibility for all or some important norms of the proposed regulation.

There are important points to be set in this context. The new Forest Code replaced the last act of 1965, after a long and controversial process, which had, from one side, great popular mobilization to avoid setbacks in the mechanisms of environmental conservation. From the other side, the land-owners pushed through greater flexibility in the size of the

permanent protection areas (APP) and pretended the amnesty for deforestation occurring before July 2008.

Once approved by Congress, the law was accompanied to the Presidential "vetoes", in nine articles of the law. President Dilma, finally, signed the code on May 25, 2012. Among the removal vetoes were articles that benefited large farmers and decreased the protection and intermittent rivers and floodplains that allowed the recovery with exotic fruit. Even with these vetoes, the Nature Conservancy Organization estimated that the new law allowed a reduction of 15% to 40% mandatory conservation area. Furthermore, it is estimated that the amnesty law environmental liabilities of about 40 million hectares deforested illegally before July 2008.

For some environmental organizations and experts the fundamental problem is that, in addition to lowering the conservation areas, the new law barely got off the ground in the last year. Only on May 29, 2013, it was announced the decree regulating the items that will be implemented and, even before its publication, the "ruralists" already arming criticism of the decree.

There are important issues to be highlighted and (effectively) secured. An important issue of the new code is the creation of mechanisms for registration, control and planning of rural properties, which allows a more rigid supervision. The Program for the Environment (PRA) should be enacted by the states and provide the foundations for producers to recover degraded areas on their properties. Also, it becomes mandatory to environmental registry (CAR) of all rural property. This registration will be on-line and will geocode the property with information about different soil occupations.

The recent decree of regulation adds two more items in the process of environmental regulation: Plan for Recovery of Degraded or Amended Areas (Prada) and Proof of Environmental Compliance (Cram). So far, out experiments and pilot projects, nothing was implemented because there was no regulation.

The government promises to put briefly into operation the Rural Environmental Registry System (Sychar), which will allow the early entries. Despite being the main point of the new code, it is also the main execution problem of the law. The new law provides for the registration and monitoring of the environmental recovery of more than 5 million farms existing in Brazil, a huge task for the responsibility of state and local environmental agencies. In many areas

there is no capacity and infrastructure to these organs to perform actions of such proportions. Worse, for those who know a bit of Brazilian agrarian situation, it is anticipated that the overlapping bureaucracy and corruption plots "voids" illegally occupied areas at the same time it creates other difficulties. It is hoped that the new Brazilian Forest Code will end the disorderly destruction of forestry, allowing the farming community to become aware of the need to make the sustainable, territory-ordered use of soil. So, the eye in the compliance with the new law is now fundamental. Recently, the Ministry of Environment set up a group to monitor the actions on the new code and evaluate suggestions and proposals for enabling legislation. The group has the participation of representatives of Ministries of Environment, Land Development and Agriculture, Livestock and Supply, the Brazilian Association of Organizations of the Environment (Abema), the National Association of Municipal Environment Bodies (Anama) and other representations of civil-society as the National Confederation of Agriculture, National Federation of Workers in Family Agriculture, Via Campesina, Friends of the Earth and The Nature Conservancy-Brazil.

In parallel, facing the slowly development of putting the law into practice, seven organizations - Environmental Research Institute of Amazonia (IPAM), SOS Mata Atlântica, Instituto Centro de Vida (ICV), Brazil-The Nature Conservancy (TNC), Conservation International (CI), Socio-Environmental Institute (ISA) and WWF / Brazil - created the observatory of Forest Code to monitor the implementation of the new law. The Centre aims to generate data and reports to promote social control, increase transparency and enhance the debate. In addition, these institutions stressed that the government has not yet defined the economic incentive mechanisms, under the new law, to promote the forest restoration and conservation.

Recently, in the early June (4/6/2013), there was a public hearing in the Committee on Environment, Consumer Protection and Surveillance and Control of the Senate to evaluate the first year of the law. During the hearing, Senator Luiz Henrique (from conservative party) held that there was a year of peace in the countryside. In fact, this intervention seems to reflect the little interest in putting the law into practice, since the penalties for illegal logging were suspended immediately after the promulgation of the law and nothing will be done until that will be signed Programs of Environmental Regularization.

According to Maira Ribeiro, writer of a blog in the environmental area, the new Forest Code was a coronation of the political force of the so-called "ruralists" and, at the same time, this strengthening of traditional rural land owner desires was accompanied by the little space occupied by social movements, their struggles and agenda (whether by land reform, sustainable agriculture or environmental justice). In fact, curiously, it was the attacks against indigenous people and the legitimacy of their territories that took the agenda and turned noticeable, not the great land owners difficulties in adapting to the new Code. That seems a real victory for "ruralists".

What will happen next it's, of course, theme for another investigation. Let's wait and see. In any case, it seems that the traditional political and economical issue of "efficiency versus equity" will be posed, as the actual situation of political disruption in Brazil is giving clear signals.

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