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New Brazilian Forest Code: Changes and Prospects
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Brazil is a continental country, with more than 8 million square kilometers and many biomes, which have permanent preservation areas and legal reserves protected by the Forest Code. On the other hand, Brazil is an agricultural country, that increasingly needs of agricultural land. In 2012 after much controversy approved the new Brazilian Forest Code. The article, then, is to evaluate the changes brought by the new Forest Code and the future impact of the same on small and medium farms and the environment. We conclude that the new forest code can have serious consequences for the environment and human life.



1. Introduction

Brazil is a continental country, with more than 8 million square kilometers. In this space, located 26 states and the Federal District, 5,565 municipalities and various biomes such as the Amazon, Cerrado, Caatinga, Pantanal and Atlantic Forest (Panasolo 2013). These regions have areas of permanent preservation and legal reserves protected by law. These rules and greetings are set by the Forest Code. On the other hand, Brazil is an agricultural country, that even though it has good levels of productivity, increasingly needs of agricultural land. This conflict between the agricultural economy and the environment is historic. Since 1934, when the first Brazilian Forest Code was created to the present, environmentalists and “ruralistas”¹ days always disagreed with the proposals made by the government (Silveira, 2013).

As highlights Panasolo (2013), in 2012, the Brazilian government created the New Forest Code, which contains new calculations of the permanent preservation areas (APPs), legal reserves, areas of slopes of rivers and lakes, areas top of the mountain, the consolidated rural area and regularization of Brazilian small farms, which should achieve sustainable. The APPs are protected, covered or not by native vegetation areas, with the environmental function of preserving water resources, landscape, geological stability and biodiversity, facilitate gene flow of fauna and flora, soil protection and ensure the well-being of human populations (Brazil, 2013). Valente (2012) shows that, according to the National Council for the Environment, the expression APP's forests and other forms of natural vegetation located along rivers or any other watercourse; around ponds, lakes or reservoirs of water, natural or artificial, on top of hills, hills, mountains and hills, slopes, or parts thereof, in salt marshes, as fixing or stabilizing dunes and mangroves. Have the Legal Reserve area is located within a rural property or possession, with the function of ensuring the economic use of natural resources sustainably rural property, assist the conservation and rehabilitation of ecological processes and promote the conservation of biodiversity, well as shelter and protection of wildlife and native flora (Brazil, 2013) .

Besides ensuring biodiversity, Legal Reserves also contribute to maintaining climatic and ecological balance with the natural pest control, pollination, humidification, protection from the wind and offer shelter for wildlife, enabling the execution of processes ecological. Also avoid the

¹ People in favor of milder code for farmers.

isolation of forest fragments and lack of reserve manageable wood; reduce the impact on the landscape, the property value and has a priceless value to agriculture itself. According to the Brazilian Society for the Advancement of Science (SBPC), preserving such areas as environmental service would allow even an increase in agricultural productivity. In soy, for example, the output could be increased to 50 % with the help of pollination. In coffee, 40%, Apple 42%, orange 35% (Valente, 2012) .

It is emphasized that the inclusion of the term "area" in the title "From Legal Reserve area" the new Forest Code is of utmost legal and economic relevance when considering the territorial space sized to Legal Reserve or one that does not have vegetation. Article 12 of the Code provides that if the area has native vegetation cover the same should be maintained, but if it is not it should be recomposed (Article 17, § 4) , ie, the legal reserve is not a Biological Reserve to predict human intervention in its territorial space through "sustainable management" (Machado, 2013) . Sustainable management is the administration of natural to obtain economic, social and environmental benefits vegetation, respecting the mechanisms that support the object of ecosystem management and considering, cumulatively or alternatively, the use of multiple wood species or not, multiple products and byproducts of flora as well as the use of other goods and services (Brazil, 2013) .

The big question that arises in discussion to evaluate the changes brought by the new Forest Code and the future impact of the same on small and medium farms and the environment. This is the main objective of this work. In order to try to answer this question, the following section of this paper seeks to analyze the evolution of environmental laws in Brazil and the conflicts, the other section aims to detail the new Forest Code and compare what has changed and what has remained unchanged, and the last section concludes the discussion showing prospects and proposals for future research work.

2. Evolution of forest laws in Brazil

The evolution of Brazilian forest law is closely linked to the process of exploitation of Brazil wood in the period of the discovery of Brazil and the Brazilian political emancipation. Since its discovery, Brazil was politically dependent on Portugal for 322 years, until its

declaration of independence in 1822. During this period the Brazilian forest law was guided by the rules of forest law. In the year of the discovery of Brazil prevailed ordination of Afonso IV of March 12, 1393, which forbade the deliberate cutting of trees. Until 1799 three new orders were drafted prohibiting the cutting of trees without permission of the authorities. After the independence from Portugal, the Brazilian Empire, on June 11, 1829, banned the felling of trees on public land without permission, reiterating the prohibitions of the granting of licenses to individuals to cut Brazil wood and other hardwoods (Antunes, 2007).

The first Brazilian Forest Code was drawn up only in the twentieth century, in 1934, 45 years after the proclamation of the republic. The Forest Code came into political, social and economic landscape of the dependence of caffeine, whose expansion became more distant forests of the cities, and endearing hindering the transport of firewood. For fear of negative social and political effects caused by the price increase and due to the lack of firewood, Decree 23.793/34 forced landowners to keep 25% of the original forest of total in the area of your property (it was the first concept of Area Permanent Preservation of Brazil). However, there was no guidance on which part of the forest land should be preserved. "The law encouraged until the complete withdrawal of native forests since at least the 25% reserve of firewood was replanted. In this sense, no matter the species, nor the variety of trees, but only to guarantee production of firewood and charcoal" (Brazil, 2013). Thus, the first Forest Code was a bit interventional instrument, as without proper protective efficacy to address the serious issues of logging and the need for legal protection of forests (Antunes, 2007).

Law number 4,771 of September 15, 1965, revoked the Code of 1934 and imposed a new Forest Code, which made changes to the concept of Permanent Preservation Area and created the Legal Reserve (50 % of the Amazon and 20 % in other regions of country). However, despite these advances, the Brazilian military government of the time deploys development plans, the main one being the "integration" of the Amazon with the rest of the country via infrastructure projects and incentives of settlement, playing a decisive role in the dynamics of increased pressure anthropogenic resources on the region. Thus, the government has put in place "a series of legislative acts and decrees executed in 1966 and 1967 with the objective to develop and occupy the Amazon region by integrating it with the rest of the country collectively known as

Operation Amazonia" (Andersen *apud* Siqueira and Nogueira, 2004) . Thus, the tax and incentives subsidized credits, combined with the expansion of the road network press the agricultural frontier into the Amazon rainforest. It is noticed again that the Forest Code did not represent a real deterrent deforestation. "Between the mid- 60s and mid- 80s, the Amazon experienced large increases in deforestation rates aiming mainly the establishment of cattle ranches (Siqueira and Nogueira, 2004). The recent history of the Forest Code shows that its restrictions remained completely ignored throughout the process, both by the government, as the scientific community.

3. The changes and prospects of the new Forest Code

The new Forest Code was first designed in 1999, amid controversy among "large farmers" and "environmentalists". On July 22, 2008, then-President Luiz Inacio Lula da Silva signed Decree No. 6514 of environmental crimes. In May 2012 the Lei nº 12.651 established the new Forest Code 12 vetoes, but only in October 2012 to 12,727 law brought changes that define the current Forest Code.

The controversy was the main feature of the construction of the new Forest Code, the discussion between the so-called "large farmers" (those who advocated more lenient rules in favor of agriculture) and environmentalists (those who argued that the new code was more severe than that prevailing at that time) was constant at about the economic costs of a stricter code versus the environmental costs of a more permissive code. Despite some progress, the approval of the final draft of the Code in 2012 by President Dilma Rousseff has generated discontent among environmentalists and their supporters to decrease the environmental protection. Table 1 summarizes the main changes in the Brazilian Forest Code² amending existing methodology concerning the areas of permanent preservation and legal reserves of the accountability system for the recovery of the areas where environmental crimes occurred.

²To evaluate the changes of the new Forest Code were confronted with Law No. 4,771 of September 15, 1965 and Law No. 12,651 of May 25, 2012, supplemented by technical analysis of those laws drafted by the Government of the State of Goiás, available at: <http://www.mgpo.mp.br/portal/system/resources/W1siZiIsJjIwMTMvMDQvMDUvMTRfMjJfMD>



Table 1: Main changes in the Brazilian Forest Code

Themes	Forest Code of 1965	Forest Code of 2012
Legal Reserve	<p><u>Area</u>: At Amazon (Amazon free for exploration): 80% in forest area; 35% in Cerrado; 20% in other regions and biomes.</p> <p><u>Calculation</u>: statutory reserves excepts APPs.</p> <p><u>Registration</u>: Register Office.</p>	<p><u>Area</u>: At Amazon: 80% in forest area; 35% in Cerrado; 20% in other regions and biomes.</p> <p><u>Calculation</u>: includes APPs booking. Buildings up to four fiscal modules need not reconstruct the RL.</p> <p><u>Registration</u>: don't need.</p> <p>Permission economic exploitation of NR with permission of National System of Environmental (Sisnama).</p>
Permanent Preservation Areas	<p><u>Calculation</u>: Protection of native vegetation from riverbanks, lakes and springs, having as parameter the full period.</p> <p><u>Economic activities</u>: Floodplains, wetlands, forests of slopes, mountain tops, and areas above 1800 meters altitude cannot be exploited for economic activities</p>	<p><u>Calculation</u>: Protection of native vegetation from riverbanks, lakes and springs, having as parameter the regular water level.</p> <p><u>Economic activities</u>: Floodplains, wetlands, forests of slopes, mountain tops, and areas above 1800 meters altitude may be used for certain economic activities</p>
Riparian	<p><u>Width of the river</u>:</p> <p>Until 10 meters: 30 meters of riparian</p> <p>Between 10 and 50 meters: 50 meters of riparian</p> <p>Between 50 and 200 meters: 100 meters of riparian</p> <p>Between 200 and 600 meters: 200 meters of riparian</p> <p>Bigger than 600 meters: 500 meters of riparian</p> <p><u>Border of mesa</u>: 100 meters of riparian</p> <p><u>Removal of vegetation</u>: Requires authorization from the Federal Executive for the suppression of native vegetation in APP and for situations where the execution of works, plans, activities or projects of public utility or social interest</p>	<p><u>Width of the river</u>:</p> <p>Until 10 meters: 30 meters riparian rivers of up to 10 feet wide is required, when consolidated in APP of up to 10 meters wide river area reduces the width of the forest to 15 meters.</p> <p>Between 10 and 50 meters: 50 meters of riparian</p> <p>Between 50 and 200 meters: 100 meters of riparian</p> <p>Between 200 and 600 meters: 200 meters of riparian</p> <p>Bigger than 600 meters: 500 meters of riparian</p> <p><u>Border of mesa</u>: 100 meters of riparian</p> <p><u>Removal of vegetation</u>: Allows the removal of vegetation in APPs and consolidated activities until 2008, provided by public utility or social interest of low environmental impact, including agroforestry activities, ecotourism and rural tourism. Other activities</p>



in PPAs may be permitted by the states through the Environmental Adjustment Program (PRA). The removal of native vegetation springs, dunes and -salt marshes may only be given in case of public utility.

Consolidated rural area	Does not include the concept of consolidated area. Recomposition, regeneration and compensation are mandatory.	Establishes the concept of consolidated rural areas. Homes up to four fiscal modules need not restore the native vegetation.
Amnesty	Penalty three months to one year simple imprisonment and a fine from 1 to 100 times the minimum wage.	Exempts landowners from fines and penalties under the law in force for irregular use of protected areas until July 22, 2008.

Source: Brazilian forest code. Developed by the authors.

Among the changes on the Permanent Preservation Areas (APP) emphasize the waiver requirement of APP in the surrounding areas of natural accumulation or artificial water with less than one hectare (article 4, § 4 of the Federal Law No. 12,651 surface / 12, as amended by provisional Measure 571/12), which undertakes various species which are marginal to rivers ponds. As the APP's margin of rivers and streams (riparian areas) maintained the previous film, but was modified to reference the demarcation Band APP margin of larger bed (highest river level measured during the rainy season) to adjust the bed so that a reduced range is the protected area. This reduction may be responsible for the increase in cases of property damage and risk to human life, because by increasing the possibility of occupation of the banks in rivers by anthropogenic activities and/or human settlements, increases the possibility of flooding in the flood period (Figure 1).



Figure 1: A permanent preservation area and near the river constructions.

Source: Gazeta Online, 2014.

The new code also relativized the APP from the tops of mountains and hills. Article 4 section IX says

no topo de morros, montes, montanhas e serras, com altura mínima de 100 (cem) metros e inclinação média maior que 25°, as áreas delimitadas a partir da curva de nível correspondente a 2/3 (dois terços) da altura mínima da elevação sempre em relação à base, sendo esta definida pelo plano horizontal determinado por planície ou espelho d'água adjacente ou, nos relevos ondulados, pela cota do ponto de sela mais próximo da elevação³.

³ on top of mountains and hills, with a minimum height of one hundred (100) feet and greater than 25° average slope, the delimited from the level corresponding to 2/3 (two thirds) of the minimum height of the elevation curve areas always relative to

Goiás (2012, page 2) states that

uma variada gama de tipos de morros, montes, montanhas e serras deixarão de ser considerados áreas de preservação permanente. **Essas áreas são especialmente relevantes para garantir a estabilidade das encostas, o que as torna de extrema importância para o bem-estar da população tendo em vista os desastres envolvendo deslizamento de encostas em época de chuvas⁴** (our italics).

Again it is noticed that the new Forest Code by relaxing some previous standards endangers human life. Figure 2 shows on the left an area in which was preserved the native and after a rockslide vegetation lives in the area were safeguarded and the right buildings in the vicinity of a hill that slid after a rainy period.



Figure 2: A permanent preservation area and near the hill constructions.
Source: Gazeta Online, 2014.

How to Program Environmental Adjustment (PRA), the new Forest Code minimizes the mandatory recovery of APP's located in rural areas consolidated until July 22, 2008 (article 61a of that law), even suspending the fines already imposed and prohibits the owner or possessor of being fined for offenses committed before that date until the implementation of the PRA in the states and the Federal District. This measure depreciates legal certainty and discredits the thousands of farmers who have completed the previous legislation.

the base, which is defined by the horizontal plane determined by plain or water mirror adjacent to or in wavy deformations by quota saddle point nearest the rise

⁴ a wide range of tops of hills, hills, hills and mountains cease to be considered permanent preservation areas. These areas are especially relevant to ensure the stability of slopes, which makes them extremely important for the well-being of the population in view of the disasters involving landslides during the rainy season (our italics).

Regarding the prospects of the New Forest Code, some authors highlight relevant aspects about the consequences that these new rules can bring to society as a whole.

In this context, Catapan *et al* (2013) , to show the breadth of the New Code in urban areas, found that he was negligent in many cases he faced , still getting the vagueness of how to proceed on the urban perimeter of channeled rivers if still fits the requirement of PPAs or not . The author also raises questions about the existence of streets and avenues already paved along rivers and occupations already consolidated over water courses and who do not fall under the law of the land regularization. It is also suggested that, for urban areas, the Forestry Code defines the principles and different parameters for the yet unconsolidated areas and leave for municipal law cases set limits and parameters for risk areas and areas with consolidated occupations in PPAs.

Coutinho *et al* (2013) notes that the NCF has been greater attention to changes regarding the use and occupation of cities, given the risk of natural disasters. Thus, for authors, proper planning of activities in the countryside or in cities, respecting the APP and other protected areas is essential for the reduction of natural disasters. Proper planning, conservation and restoration of APP and RL in the context of Law analyzed, along with other instruments for use and occupation, may help reduce the risk of natural disasters, through the reduction and mitigation consequences generated by the processes of flooding and mass movements.

Zabot and Oliveira (2013) show that allowing legal impediments in terms of the current Forest Code helps to generate exactly the opposite effects to those expected by the law . If you want a more sustainable environment, small farmers should be the protagonists of the process, part of the whole society, which needs to be aware and be prepared to pay the environmental cost internalized in sustainable products, after all, it is necessary to enable economically properties committed to sustainability. Another point to be highlighted is the need to expand the environmental issue debated by incorporating other elements that are as important as the preservation of riparian forests for the balance of ecosystems, such as the rational use of pesticides and fertilizers, proper disposal of sewage and waste, controlling soil erosion, reducing emission of greenhouse gases , among others . What is proposed is revealing that, although relevant, vegetation cover was merely one of several factors of the ecological crisis of agriculture.

Ribeiro *et al* (2013) analyzes the impact of the new Forest Code in the recovery of Permanent Preservation (APPs) and evidence that the legal changes in federal environmental law, do not promote the conservation and restoration of natural resources, in particular, the permanent preservation areas on farms.

4. Conclusions

Since the Forest Code was adopted in 2012 and still in transition between this and the previous code, the work accomplishes its objective to identify the changes between it. A brief review of the changes the new code shows that it has become more lenient in previous codes, despite intense discussion and action by environmentalists concerned about the deforestation of the Amazon. The Brazil as a country with vast territory and strong economic dependence on agriculture should be more aware of environmental issues, the correct soil management, aiming to promote sustainability, conservation of forests and consequently the water and thus the welfare of generations future. We notice the absence of scientific knowledge to sustain the changes of the permanent preservation areas and legal reserves, which, in most cases, are the same for all biomes, disregarding its peculiarities studies.

Regarding the prospects are noticed many questions about the actual effectiveness of the new Forest Code, emphasizing the applicability and legal certainty of it. On the applicability, despite the importance of the debate on the voting code to pique the interest of society on the environment, there was little involvement of the same in the process of designing the code and knowing the adequacy of institutional practices is a process slow that only have good results if combined with awareness and education, one wonders how the company will absorb the new rules.

Two aspects are relevant in the consideration of legal certainty, first amnesty given farmers who did not fit in the above code works against those who fulfilled the law, so can a disincentive for them to suit to the new code. The second aspect is the excess of standards in the Brazilian legal framework, a phenomenon called "legislative inflation", the impossibility of monitoring prints in society a sense of impunity, which combined with its economic costs discourages the population to remain within the law.

Finally, we highlight the natural disasters in the states of Espírito Santo, Minas Gerais and Rio de Janeiro in December 2013 due to heavy rains, which are repeated every year as a negative indicator of relaxation of building standards in riparian areas and slopes as a disregard for future populations that can be released to build in areas potentially at risk.

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