






New Contours of the Native Vegetation Protection Law of 2012

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ABSTRACT

The conservation of natural resources within rural properties is a constitutional obligation. Among the social function criteria required for the exploitation of rural properties, besides the rational use and respect of working conditions, there is a need to ensure environmental protection. The current guidelines regarding the exploration and the environmental adequacy of the rural property are in the Native Vegetation Protection Law (NVPL – Law no. 12,651/2012) also known as Forest Code of 2012. This study aims to analyze different aspects of the Brazilian forestry legislation, with emphasis on the main points of the new legislation regarding the use and conservation of rural properties, highlighting the Rural Environmental Registry replacing the old model of Legal Reserve Registration. It is an update of the article “Ambient protection areas inside rural properties: the APP and RL case” published by *Floram* in 2011.

Keywords: environmental regularization, rural environmental registry, forestry legislation.

1. INTRODUCTION

The main human concern over thousands of years has been the conquest of territories and their natural resources for the acquisition of economic and political power. Over time, this interaction, besides promoting social imbalance and hence environmental, started to generate conflicts of interest that eventually resulted in legal environmental relationships.

The first Forest Code, Decree no. 23,793/1934, was an important instrument to define the bases for territorial protection of forest ecosystems and other forms of natural vegetation in the country, although lacking an essentially environmental conceptual basis and still identified with the rational use of forest resources and their economic purposes (Figueiredo, 2007). The main preservation characteristics of the scope were the restrictions on private property, where all owners should keep 25% of their properties with native forest cover (Dean, 1996) and the establishment of private property use according to the existing forest type, classified into four categories: protective, remnant, model, and yield forests (Borges & Rezende, 2011).

Until the second edition of the Forest Code in 1965, Law no. 4,771, few regulations aimed at protecting environmental resources in rural property. Based on the Law, the existing forests in the national territory became to be considered as goods of common interest to the whole population and then the government limited the use of these areas through the creation of “permanent preservation forests” and “forest reserves”.

However, these new nomenclatures opened gaps for hermeneutic distortions because they considered only the plant formations composed of forests as areas to be reserved or permanently preserved. Thus, in order to make undoubtedly the understanding and scope of protection of these spaces, the Law no. 7,803/1989 and Provisional Measure (PM) no. 2,166-67/2001 were enacted including the new terminologies “legal reserves” (LRs) and “permanent preservation areas” (PPAs).

PPA refers to the area covered or not by native vegetation that must be kept untouched whether in public or private lands due to its importance for the maintenance of ecological processes. However, LR corresponds to the area within a rural property with variable extent depending on its location, subjected

to economic use by means of the approval of the competent environmental agency. While the PPAs have the ecological functions of preserving water resources, landscape, geological stability, biodiversity, fauna and flora, as well as protecting the soil and guaranteeing the well-being for the beneficiary population, the LRs intend to assist the maintenance and rehabilitation of ecological processes, promoting the biodiversity conservation.

The Forest Code of 1965 (Law no. 4,771/1965) was amended by several laws, provisional measures and resolutions of the National Council of Environment (Conama) in order to correct flaws and bring understanding to controversial points of the former Forest Code. These several changes brought legal insecurity to the instrument of environmental regulation, being a reason for concern by rural producers to justify the discussion and approval of a new legislation by the National Congress, whether a new Forest Code. Draft Law no. 1,876/1999 was widely discussed and, after installation of a Special Commission of the Forest Code in 2009, the third Forestry Code under Law no. 12,651/2012 was deliberated and approved.

According to Roriz & Fearnside (2015), although the Forest Code of 1965 created important mechanisms for the conservation of Brazilian vegetable formations and other natural resources, its inefficient application opened gaps for the transition and creation of a new law in 2012, which weakened environmental protection, implying impunity to the legislation.

The New Forest Code was biased on interests related to the increase of the agricultural area in Brazil, with demands to improve the work conditions of rural producers, especially small ones. In total, 32 amendments were made and resulted in the PM no. 571/2012, then converted into Law no. 12,727 in the same year. It should be noted that, according to the Constitutional Amendment no. 32/2001, PMs created after 2001 can no longer be reissued, i.e. if they are not converted into a law within the time limit of 60 days, they will lose their value.

For Tambosi et al. (2015), the Forest Code goes against what would be necessary for an adequate management of natural resources and brings uncertainties regarding its changes, varying from region to region.

Although there are setbacks in the environmental protection foreseen in the Forest Code of 2012 by

several authors, it is important to point out important advances, in which technical instruments were defined for the environmental regularization of properties, such as the Rural Environmental Registry (RER) and the Environmental Regularization Program (ERP). According to Brancalion et al. (2016), the instruments for implementation of the Forest Code will only be effective if properly incorporated in the scope of agricultural policies, with technical assistance, fiscal and technical incentives aiming LR compensation and PPA recovery, Payment for Environmental Services (PES) and establishment of environmental quality criteria. Themes that have historically fostered agricultural, livestock and forestry production without corresponding to environmental sustainability.

The aim of this study was to identify, analyze and clarify the main points of the new Forest Code of 2012, as well as to describe the system of protected areas within rural properties in order to update the guidelines available in the article "Protected areas in the interior of rural properties: the issue of PPA and LR" published by *Floram* in the 2nd edition of 2011.

2. THE SMALL HOLDINGS OR RURAL FAMILY PROPERTIES

The concept of small holding or rural family property has received differentiated treatment in current forest legislation. Based on Law no. 4,771/1965, a small rural property or family rural property was understood as those exploited through the personal work of the tenant farmer and his/her family, with the possible assistance of a third party whose gross income was at least 80% from agroforestry activity or extractivism.

The new Forest Code incorporated the concept established by Law no. 11,326/2006, which establishes the guidelines for the formulation of the national policy on family agriculture and rural family enterprises (Article 3):

That exploited through the personal work of the family farmer and rural family entrepreneur, including settlements and agrarian reform projects, and that meets the legal precepts: does not hold, in any title, an area greater than four fiscal modules; predominantly use the labor of the own family in the economic activities of its establishment or enterprise; has a minimum percentage of family

income originated from the economic activities of its establishment or enterprise, as defined by the Executive Branch; and run your establishment or enterprise with your family.

The new law still frames the properties according to the fiscal module, being a unit of measure fixed differently for each municipality according to Law no. 6,746/1979, which considers the predominant exploitation type in the municipality, the obtained income with the predominant exploitation and other existing holdings in the municipality that, although not predominant, are expressive according to the income or used area.

Thus, the rural property with an area below one fiscal module is now considered a smallholding; between one and four modules is considered a small holding or rural property; between four and 15 modules is considered medium holding or rural property; and finally, with more than 15 modules, the property is considered as a large holding or rural property (Ipam, 2013).

According to Borges & Rezende (2011), in order to ensure the economic and social survival of small holding, there were legal mechanisms in the law of 1965 that made the use of LR more flexible. The new law of 2012 brought even greater flexibility to this group of producers by allowing the occupation of the rural area in LR and reduce the restrictions in cases of PPA regularization.

3. LEGAL RESERVE

3.1. Size of the legal reserve

The new legislation of 2012 maintained the obligation to have an area with native vegetation cover as LR for all rural properties, following the minimum percentages: 80% in the property located in forest areas in the Legal Amazon, 35% in the property located in savanna areas in the Legal Amazon, 20% in the property located in general fields in the Legal Amazon and 20% in other Brazilian regions.

3.2. Location of the legal reserve

The location must be approved by the competent state environmental agency or by agreement made by

the municipal agency or another qualified institution, following the criteria:

I) the river basin plan; II) Ecological-economic zoning (EEZ), since the EEZ is related to land use capacity, the Executive Branch may reduce the LR for up to 50% of the property in the Legal Amazon or increase by up to 50% in any other region of Brazil for the restoration purposes; III) the formation of ecological corridors with another LR, with PPA, with conservation unit or with another legally protected area; IV) areas of major importance for the biodiversity conservation; and V) the areas of greatest environmental fragility (Brasil, 2012).

This item remained almost uniform, but the new law innovated by establishing the continuity of the protection of LR areas when the properties that hold it are inserted in the urban perimeter. In other words, the native vegetation area under LR ownership in a rural property will now be called the urban green area when the property is inserted in an urban area in settlement projects. However, the law does not state how these areas should be managed and used in order to minimize the negative impacts caused by the urban neighborhood. It only predicts that they will be transformed into municipal parks, being necessary to create norms or decrees to suppress anti-conservation actions provided by the law gaps.

3.3. Legal reserve registration × rural environmental registry

Law no. 7,803/1989, as previously seen, brought the term LR and hence the obligation to register these areas to be protected. The old code established the obligation to record the LR in the margin of the property inscription, in the related real estate registry, being forbidden its alteration of destination in cases of transmission, dismemberment or rectification of the area. In short, for the process, the owner hired a qualified professional to demarcate and prepare the LR's registration report of the property, which was then forwarded to the environmental agency to decide whether or not to grant the proposed report.

This report should verify the vegetation, as well as the land use situation. In the case of a fragment of native vegetation within the property that is close to another LR or PPA area, this should be proposed

to constitute the LR. Once approved, the owner was obliged to sign a Conduct Adjustment Declaration (CAD) with the competent body, containing the LR location, its basic ecological characteristics and the prohibition to suppress its vegetation.

With the new rules, the rural landowner was exempted from registering the LR in a notary public (except in cases of Environmental Reserve Quotas (ERQ), to be discussed later). However, he became obliged to join the Rural Environmental Registry (RER) (Law no. 12,651/2012, article 18, paragraph 4). To join the RER, the landowner must apply for the municipal or state agency registry declaring the following items: I) its identification; II) proof of possession; III) property's identification by means of a plant and a descriptive memorial containing the indication of the geographic coordinates, with at least one lashing point of the property perimeter, the location of native vegetation remnants, PPAs, restricted use areas, consolidated areas, and LR.

Through this new registry, all the information regarding the PPA's environmental situation, the LR areas, the forests and the native vegetation remnants, the restricted use areas, and the consolidated areas of the rural properties of the country will compose an integrated database with satellite photos available to the entire population. The RER, besides serving as an aid tool for territorial management and monitoring, aims to draw a digital map from which the values of the areas for environmental diagnosis will be calculated. This will help undoubtedly in the control of LR, much more than the registration in notary public, whose control was only on-site visit (Laudares et al., 2014).

3.4. Limitation of use

The landowner, holder or occupant of any LR title must keep the LR with cover of native vegetation and cannot suppress it. However, economic exploitation is supported through sustainable management, which promotes an indirect protection of the area, since it prohibits: I) the shallow cutting where all the trees or part of the forest stand are felled, leaving the terrain temporarily free of vegetation cover and with difficulty of regeneration; II) the use of agrochemicals that promote the same shallow cutting results; and III) alternative land use that replaces native vegetation and successive formations, other land coverages such as agricultural

activities, mining, settlements and other forms of occupation (Borges & Rezende, 2011).

The only exception for LR suppression refers to any activities or low environmental impact, as long as it is authorized by the competent environmental agency. Those who do not comply with Law no. 12,651/2012, whether by default to actions contrary to it or due to lack of regularization, may be punished civilly, administratively and criminally by the Law of Environmental Crimes (Law no. 9,605/1998), being forced to repair environmental damages.

The new law indicates that the collection of non-timber forest products, such as fruits, vines and seeds is free, safeguarding some harvesting techniques (Article 21). It further adds (Article 22) that the management of LR for commercial purposes depends on the authorization of the competent body with the obligation to keep the vegetation cover and not to harm the vegetation conservation in order to ensure the maintenance of the species diversity; and to conduct the management of exotic species with the adoption of measures that favor the regeneration of native species.

3.5. Regularization of the legal reserve: alternatives for restoration and compensation

The LR regularization can be accomplished by means of three alternative or complementary techniques: the restoration by natural regeneration or by planting, the computation and the compensation.

3.5.1. Restoration by natural regeneration and planting

There were no changes regarding the conduct of natural regeneration. Both the previous Code (Law no. 4,771/1965) and the current Law (Law no. 12,651/2012) maintain that this technique must be proven by a technical report and may be required to isolate the area.

However, the restoration by planting differs between the two legislations. Under Law no. 4,771/1965, the LR reconstitution should be done every three years from 2001 – date of the PM no. 2,166-67/2001 that established the deadlines – of at least 1/10 of the total area required to complement them with native species, in accordance with criteria established by the competent state environmental agency. This could take 30 years to complete, so the regularization period would end in 2031. On the other hand, the Law no. 12,651/2012 has a lower limit period of 20 years for LR restoration, therefore, planting should be done at least in 1/10 of the total area required to complement it every two years. This deadline will start from the adhesion to the PRA, which will become effective from January 1st, 2018, ending in 2038. According to Table 1, although the recovery time of 30 years of the previous Forest Code is greater than that of the current Forest Code (20 years), the regularization period increased in seven years since the first situation, which allows to affirm that there was a great flexibility in the new Forest Code in the fulfillment of the LR regularization.

Another point to be commented on the Code changes regarding the restoration refers that this could be performed with the temporary planting of exotic species as pioneers, aiming at the restoration of the original ecosystem. The new law allows the permanent use of exotic species on the restoration in 50% of the LR of all properties (paragraph 3, article 66). The non-temporary planting of exotic species contradicts the very definition of the LR function: *promote the conservation of biodiversity, as well as the shelter and protection of wildlife and native flora* (Article 3, item III).

The last aspect of this new Code regarding the restoration is based on those rural properties that had, on July 22nd, 2008, an area with up to four fiscal modules and that had remaining native vegetation in

Table 1. Legal Reserve recovery according to the old and new Forest Code.

	Law 4,771/1965 PM 2,166-67/2001	Law 12,651/2012
Recovery rule	1/10 every 3 years	1/10 every 2 years
“Base” year to start the LR recovery counting	2001	2018 – deadline for adhesion to the PRA
Estimated time for LR recovery	30 years	20 years
Year of LR regularization	2031	2038

percentages lower than that provided in Article 12. Based on the new law, LR can be constituted with the area occupied with native vegetation existing on July 22nd, 2008, new conversions for alternative land use being forbidden. With this measure, if a property under four fiscal modules – which in some regions of Brazil can reach up to 440 hectares – does not own even 1% of native vegetation to compose the LR, it may be exempted from fulfilling such obligation.

3.5.2. *Computation of legal reserve*

Although PPAs and LRs are distinct and complementary, for the purpose of regularization, according to article 15, the computation of PPAs is allowed in the calculation of the LR percentage following some impositions, such as: the benefit foreseen in the article does not imply in conversion of new areas for alternative land use, the area to be computed must be conserved or under recovery process and the landowner or holder has been included in the RER. Regarding the Legal Amazon region, the Code foresees this inclusion when the sum of PPAs and LRs exceeds 80% of the property.

According to the old Code, regularization with computation use was much more rigid (Article 16, paragraph 6), since besides not allowing the conversion of new areas for the alternative land use, the sum of the native vegetation in PPA and LR should exceed 80% of the rural property located in the Legal Amazon; 50% of rural property located in other regions of the country; 25% of the smallholding, whose area does not exceed 50 hectares if it is located in the drought polygon or to the east of the 44°W Meridian of the Maranhão State, and 30 hectares if located in any other region of the country. It should be pointed out that the rule in the previous paragraph was an exception to the rule in which the computation was permitted only in specific situations, but it is a general rule in the new Forest Code, where the PPA computation in LR may be in any circumstance to reach the minimum required. Even allowing the computation of PPPs in the LR calculation, the PPA use regime still remains practically untouched, while the LR area allows for sustainable management.

Lewinsohn et al. (2010), Metzger (2010) and Silva et al. (2011) believe that this computation can be reckless in biological terms because these areas have

the functions and compositions of distinct species, i.e., the PPAs do not protect the same species present in LRs, and thus play complementary roles in terms of conservation and biodiversity.

3.5.3. *Compensation*

According to the Code of 1965, it was possible to compensate LR for another equivalent area in extension and ecological importance, since it remained in the same ecosystem and was located in the same microcatchment where the property was located. If it is not possible to compensate the LR in the same microcatchment, the competent environmental agency should apply the criterion of the closest possible proximity between the property devoid of LR and the area chosen for compensation as long as in the same catchment area and in the same state, being attended when there is the respective catchment plan (Brasil, 1965).

The new law allows to compensate LR by acquiring ERQs, leasing some area under environmental easement or LR, donating an area located inside a pending regularization conservation unit to the public power, and registering another equivalent area and surplus to the LR, in property of the same ownership or acquired in third-party property with established vegetation or restoration, since located in the same biome (Brasil, 2012).

The quotas consist of representative land cover titles that can be used to compensate the lack of LR in another property, i.e. those properties that have LR deficits can rent or buy native areas that have reserve surplus. In this sense, the person responsible for maintaining the conserved area will be the landowner that issued the ERQ.

The easement regime consists on the limitation of a rural property or part of it with the purpose of conservation, preservation or recovery of the natural resources, signed by the landowner or tenant farmer by means of administrative term before the environmental organ integrating the National Environmental System (Sisnama). The protection regime of the easement area is similar to the LR's protection regime, nevertheless, it has validity and therefore exempt from the onus of the perpetual conservation. The portion of land established as

“environmental easement” may be rented for LR compensation from another property, however, unlike the quotas, the responsibility for that area will be from the lessee.

The compensation will have a major influence on the scale of the landscape, where there will be a concentration of conservation in the areas of low agricultural suitability and high devastation in the areas with productive capacity. For Metzger (2010), the excessive concentration of LR in a single region, even if located in biologically equivalent areas, could lead to the existence of biological deserts formed by large monocultures in homogeneous landscapes. For instance, if instead of having two landscapes with 30% of native vegetation, we had one with 50% and another with 10% of landscape, this 10% will be formed only by very isolated fragments and could be an important barrier to the movement of species on a regional scale.

Researchers of the Brazilian Society for the Progress of Science (SBPC) (Silva et al., 2011) also declared against restoration in the same biome instead of the microcatchment, but as it has already been approved, they affirm that the most pertinent recommendation is LR compensation to be made as close as possible to the deficit area, considering the proper microcatchment or even nearby microcatchments or catchments, but of the same ecological equivalence and not indistinctly allowing the compensation in the biome, without any clearly defined mechanism to ensure ecological aspects and even economic compensation.

The compensation must be submitted to approval by the competent state environmental agency, and may be implemented through the “condominium” scheme among more than one property respecting the legal percentage in relation to each property.

The condominium scheme consists of a partnership among several owners or tenant farmers to establish a single LR representative for all members, where everyone is responsible for its conservation and maintenance. It is common for continuous areas, such as properties divided for inheritance purposes. If there is native vegetation in a portion of the property, it becomes easier to use it and institute LR in condominium than to recombine each parcel destined to each heir.

4. PERMANENT PRESERVATION AREAS

Unlike LRs that are areas to be proposed and delimited within the rural property for the conservation of natural resources, PPAs are fixed areas, delimited according to their location and geographic characteristics, to be protected and kept untouched within rural properties and urban areas.

According to Sparovek et al. (2011), PPAs are primarily delimited areas for the protection of rivers and their recharge areas, as well as natural vegetation of areas considered as priorities for conservation from the ecological point of view. According to the article 4 of Law no. 12,651/2012, it is considered as PPAs “the marginal bands of any natural watercourse from the channel’s edge of the regular bed, at a minimum width of” (Table 2):

Table 2. Width of the permanent preservation area in relation to the width of the watercourse.

Width of the watercourse (m)	Width of the PPA (m)
≤10	30
10-50	50
50-200	100
200-600	200
>600	500

According to the new Code (article 4), the footage remains the same, however, instead of establishing it from its highest level, the calculation is established from the channel’s edge of the regular bed. They also disregard the marginal ranges of ephemeral courses, covering only the perennial and intermittent.

In the following pages, some of the topics present in article 4 of the new Code are going to be analyzed and discussed, all identified with Roman numerals.

I. Areas around natural lakes and lagoons

Rural areas around natural lakes and lagoons with up to 20 hectares of surface should have 50 m, over 20 hectares of surface (water depth), and the marginal range should have 100 m. In urban areas, 30 m.

II. Areas around artificial reservoirs

As a result of natural watercourses or damming, the range will be defined in the project’s environmental

license. The reservoirs destined to energy generation should have a range from 30 to 100 m in rural areas and from 15 to 30 m in urban areas.

In both natural and artificial accumulations with an area of less than one hectare, the reserve of the protection range is waived, and new suppression of native vegetation areas is prohibited unless when authorized by the competent environmental agency of the Sisnama. Protection range are still waived for artificial reservoirs that do not flow from damming.

The new Forest Code established that the marginal ranges (PPA) surrounding the reservoirs will be defined in the enterprise's environmental license, except for reservoirs built up to 2001 where the PPA will be the difference between the normal maximum operating level and the *maximorum* quota.

III. The areas around the headwaters and perennial waterholes, regardless of the topographic situation, within a minimum radius of 50 m;

The Forest Code of 1965 provided greater protection, since it covered intermittent waterholes. For the Federal Public Ministry for the Environment (Brasil, 2011), the new law disregards the fact that there are cases in which headwaters, even if perennial due to specific topographic conditions, do not allow directing the water arising for the formation of a watercourse, giving rise to humid, wet and flooded regions with significant ecosystemic value, fragility and environmental vulnerability, similarly requiring legal protection. The new Code withdraws the legal protection of these areas from headwaters just because they do not start a watercourse. In addition, failing to protect the headwaters because they do not flow at a certain time of year may imply a change in the vegetation cover, with possible disappearance of these waters. This loss can be considered the biggest setback in the text of the new Forest Code of 2012.

According to Skorupa (2003), in the headwater areas, the vegetation acts as a buffer of rainfall, avoiding a direct impact on the soil and its compaction. It allows, together with the whole root mass of plants, that the soil remains porous and capable of absorbing rainwater and feeding the water table. In turn, it prevents excessive surface runoff from carrying soil particles and toxic waste from agricultural activities into the bed of watercourses, polluting and burning

them. In the margins of watercourses or reservoirs, the riparian PPA ensures the stabilization of its banks avoiding its soil to be directly taken to the bed of the courses; acting as a filter or as a "buffer system". In the hydrological control of a catchment area, PPA acts as water flow regulator and hence of the water table. The decrease in riparian PPAs means loss of habitats, lower biodiversity and instability of watercourses.

IV. On slopes or part of these with declivity higher than 100% or 45° in the line of greater slope;

This item only changes the form of writing what becomes "the slopes or part of these with declivity higher than 45°, equivalent to 100% in the line of greater slope" (Article 4 of Law no. 12,651/2012). This vegetation must always be kept untouched, since its removal can lead to soil damage, such as landslides and erosion, worsening the picture when it comes to urban occupations, where houses are landed and collapsed (Brasil, 2012).

V. The sandbanks, as dune fixers or mangrove stabilizers;

The Conama Resolution no. 303/2002 defined as PPA the range of 300 m from the maximum high tide. Although the new Forest Code defines as PPA only the sandbank extension when fixing the dunes or stabilizing the mangrove, it is understood that the Resolution of Conama has validity of application, avoiding gaps for usurpation of these spaces, since the footages were not defined in the Forest Code. Therefore, it is understood that the 300 m of PPA are considered the minimum limits, and the range of PPA may be larger.

VI. The mangroves, in all their extension;

Established by Conama Resolution no. 303/2002 and incorporated by the new Code. Importantly, since these areas play an important role as exporter of organic matter to estuaries, contributes to primary productivity in the coastal zone; fish, molluscs and crustaceans find the ideal conditions for reproduction, nursery, breeding and shelter for various species from aquatic and terrestrial fauna; the vegetation serves to fix lands, thus preventing erosion and simultaneously stabilizing the coast; the roots function as filters in the sediment retention and constitutes an important genetic bank for the recovery of degraded areas (Conama, 2002; Olinto et al., 2013).

VII. The edges of the tablelands or plateaus, up to the relief's rupture line, in a range never lower than 100 m in horizontal projections;

These areas have suffered with the expansion of the agricultural border. The regions of Mato Grosso, Goiás and Bahia have significant areas with tablelands and should create restrictions for the disorderly advance of the agricultural border. The state of Mato Grosso anticipated and defined as PPA the areas of the top and bottom of the relief's rupture line in projection of 100 m, being that PPA refers to the relief's upper part for the Federal Forest Code.

VIII. At the top of hills, mounts and mountains, with a minimum height of 100 m and an average slope greater than 25°, the areas delimited from the level curve corresponding to 2/3 of the minimum elevation height always in relation to the base, which is defined by the horizontal plane determined by the adjacent plain or water mirror or by the height of the saddle point closest to the elevation in the corrugated reliefs;

By the Forest Law of 1965, the minimum height and the average slope so that the tops of hills, mounts and mountains were consecrated as PPAs were smaller. According to Conama Resolution no. 303/2002 – which complemented the Forest Code by means of the provision of parameters, definitions and limits of PPAs –, the minimum height was 50 m and the slope of approximately 17°.

This alteration results in the general protection loss to PPA, since hills with this type of inclination and height are rare in Brazil, besides the measurement of these tops of hills has difficult operability. According to the opinion of the Federal Ministry (Brasil, 2011), with this measure, a smaller number of areas will be included in the concept, excluding protection areas that are relevant to guarantee slope stability, which in turn is extremely important in view of the disasters involving slides during the rainy season.

IX. The areas at an altitude above 1,800 m, whatever the vegetation.

Very few areas in Brazil exceed the altitude of 1,800 m. It does not represent even 1% of the national territory. They are environments of extreme environmental sensitivity and very little agricultural suitability or another economic use, with rare exceptions. They are

environments with vocation for preservation of endemic species of fauna and flora and places of singular scenic beauty, for this reason the protection character as PPA.

X. In savannas, the marginal range in horizontal projection, with minimum width of 50 m from the border of the swampy and drenched space.

As well as mangroves, the savannas were established as PPAs in the Conama Resolution no. 303/2002 and incorporated into the new Forest Code of 2012. A slight flexibility can be noted in this item. Based on previous legislation, it was measured 50 m from the swampy and drenched space. The new Code states that this measurement will start from the permanently swampy and drenched space.

4.1. Other areas protected by the Forestry Code of 2012

The Forest Code of 2012 allows to create and declare PPA by the Chief of the Executive Branch. Areas covered with forests or other forms of vegetation can be considered as PPA for several purposes, such as control soil erosion and mitigate risks of floods and landslides; protect sites of exceptional beauty or scientific, cultural or historical value; assist the defense of the national territory at the discretion of military authorities; among others.

Borges & Rezende (2011) emphasized that the old Forest Code of 1965 defined the possibility of institution and declaration of PPA by means of "Federal Power Act". These areas should have environmental relevance, such as the surroundings of a gully or a forest of exceptional scientific value. Moreover, the act of the Public Power (Federal, State or Municipal Decree) should specify the importance of the PPA creation.

However, Pantanal wetlands, slopes and sloping areas between 25° and 45° are not considered as PPAs because they are environmentally sensitive. This is why they were declared as restricted use areas (RUA) by the new Forest Code. Management in these areas must comply with the technical recommendations of the official research bodies, with new suppressions for alternative soil uses conditioned to the authorization of the state environmental agency. In Minas Gerais, intermittent headwaters no longer considered as PPAs were included as RUAs.

The treatment of PPAs should be the same in both rural and urban areas. However, it is well known that PPAs in urban areas are one of the most complicated aspects of environmental legislation due to the overlapping of several legal norms, since besides the Federal Forest Code (Law No. 12,651/2012), there is the Federal Law on urban area allotment (Law no. 6,766/1979) and several Conama resolutions and also specific legislations of each state and municipality.

The establishment of a less rigorous minimum limit for urban areas is inadvisable from the environmental point of view. According to Borges and Rezende (2011), the Forest Code should not differentiate PPAs in urban or rural areas and the protectionist limit of the Forest Code should be applied to both environments. Legislators seem to have heard the experts and made this understanding clear in the new Forest Code. The states and municipalities must define more restrictive norms, never more permissive than the Federal Forest Code.

4.2. *Intervention and suppression*

The protection regime of PPAs, both by the old law (Article 4) and the current law (Article 8) is inexorable, stating that these areas must be kept untouched, except in special cases of public utility, social interest or low environmental impact, which allow intervening or suppressing the vegetation in PPA according to Conama Resolution no. 369/2006. In the case of native vegetation protecting dunes, sandbanks (Conama, 2006) and headwaters (Brasil, 2012; Conama, 2006), the suppression of protective vegetation is even more restrictive and is only authorized in case of public utility.

The New Code, however, loosened the protection by permitting the intervention or suppression of native vegetation in the sandbank and mangrove areas (Article 8, paragraph 2), where the mangrove's ecological function is compromised for the execution of housing and urbanization projects inserted in land regularization projects of social interest and consolidated urban areas occupied by low-income population. The law should have prioritized the remediation and recovery of these areas rather than occupation, since a large part of these compromised sites are contaminated with high levels of heavy metals and oil, which can affect the health of

the population (Silva et al., 2011) as well as promote an imbalance of the local fauna.

4.3. *Restoration*

Law no. 4,771/1965 did not establish guidelines for the restoration of PPAs, which occurred only in 2011 with the Conama Resolution no. 429/2011, the methodology for the restoration of these areas. According to article 3 of this resolution, the recovery of PPA could be done by conducting the natural regeneration of native species, planting of native species, and planting of native species in conjunction with the natural regeneration of native species.

According to this same resolution, the activities of sustainable agroforestry management in smallholdings or rural family holdings could be applied in the recovery of PPAs, according to article 6, since there was soil preparation and erosion control, restoration and maintenance of the vegetal physiognomy native species, limited use of agrochemicals, non-use of invasive alien species, restricted use of grazing area of domestic animals, consortium of perennial species destined to the production of products, among other measures that would not compromise the stability of these areas.

The new Forest Code incorporated in its text the methodology of Conama Resolution no. 429/2011 and added, with regard to the PPA recovery, the permission to plant intercropping of woody, perennial or long cycle native exotic species of regional occurrence, in up to 50% of the total area to be restored in the case of small rural properties.

Regarding the recovery in consolidated areas – i.e. with anthropic occupation pre-existing on July 22nd, 2008, with buildings, improvements or agroforestry activities admitted, in the latter case, the adoption of the fallow regime –, a minimum footage to be recomposed will be established according to the number of fiscal modules of the properties in which they are inserted. The properties that hold up to four modules will be exempt from recomposing LR, however they will not be exempt from recomposing the PPAs, as revealed in simplified article 61-A in Table 3.

If the property use is not consolidated, the landowner or tenant farmer must recover the PPA or LR to its full extent.

Table 3. Minimum footage to be recomposed in the PPAs according to the size of the rural property in Fiscal Modules (FM).

Restoration	Marginal ranges	Natural lakes/lagoons	Savannas	Headwaters
5 m	Properties smaller than 1MF	Properties smaller than 1MF	-	-
8 m	Properties between 1 and 2 MF	Properties between 1 and 2 MF	-	-
15 m	Properties between 2 and 4 MF	Properties between 2 and 4 MF	-	All properties
30 m	-	Properties above 4 MF	Properties with up to 4 MF	-
50 m	-	-	Properties above 4 MF	-
*	Properties above 4 MF	-	-	-

*Defined according to the environmental recovery plan, observing minimum of 20 m and maximum of 100 m.

5. INCENTIVES TO PRESERVE

Based on the old Forest Code, those who conserve, preserve and recover the PPAs would have preferences in official projects of technical assistance, construction, infrastructure, rural electrification, roads and bridges, rural credits and exemption from rural territorial tax (RTT). As Borges & Rezende (2011) stated, all this was in the field of good intentions because it did not occur in practice. What was significant was only the RTT exemption, however, the calculations showed that the value of this disengagement was very small compared to the opportunity cost of using and exploiting those areas.

The new Forest Code innovates with the Payment for Environmental Services (PSA), a mechanism that emerges as an economic perspective in relation to law and the environment and is shown as an effective mean for the protection of LR and PPA in small rural properties through the valuation of the environment, whether environmental or services goods. Through this instrument, the chance of remuneration for the preservation of PPA areas and LR, which could not be possible, considering that these small producers often do not have easy access to credit. Several PES models and types need to be implemented after a thorough environment and situation analysis that is the case being applied. Certainly, there will be a suitable format for each type of situation and that will bring the recognized benefits of the PES to the sustainable development of environmental resources. What cannot happen is just fully replicate previous models of success, since specific parameters fits in each reality.

The PES works to compensate people who care and act in the environment conservation, as well as serve to arouse the interest of others who have not yet understood the effectiveness of this instrument, protecting natural resources and benefiting those who work on it.

In Minas Gerais, a gain can be noted with the new Forest Law (Law no. 20,922/2013) in relation to incentives for environmental protection, mainly in relation to the PES, because 50% of the amount collected in the state with environmental fines will be allocated to the Bolsa Verde program, whose main objective is to promote social inclusion of populations living in extreme poverty, combining the transfer of income with environmental conservation activities.

6. MAIN POSITIVE AND NEGATIVE ASPECTS OF LAW 12,651 OF 2012

The main positive aspects of the new legislation are: I) the rural environmental registry that, even in the adhesion phase, according to Laudares et al. (2014), has been shown to be a more practical and safe control and management mechanism than the notary system; II) the promotion of incentives for environmental preservation, besides the exemption of rural territorial tax (RTT), such as PSA and the possibility to trade environmental reserve quotas; and III) the inclusion of characteristics, such as savannas and mangroves as PPAs.

On the other hand, the negative aspects are: I) the reduced protection of areas to be permanently preserved, such as the ranges along the watercourses

(measured from the channel's edge of the regular bed rather than the edge of the largest seasonal bed) and the hill regions (only considered as PPAs are the tops of hills that have a minimum height of 100 m and an average slope greater than 25°, instead of the minimum height of 50 m and an average slope greater than 17° as stated in the old Code); II) the consolidated use, whereby interventions in PPAs and LRs, contrary to the legislation, before July 22nd, 2008 have become possible for continuity; III) not to consider PPA intermittent headwaters, unlike the Forest Code of 1965; and IV) amnesties for those who failed to comply with the PPAs and LRs by joining the environmental regularization program (ERP). As previously seen, the footages to be recomposed will be performed according to the property size in fiscal modules, and the small absolved ones will recompose the LRs. It should be noted here that the PRA is being drafted and implemented. It is a set of actions or initiatives to be developed by landowners or tenant farmers in order to adjust and regularize the rural property. It consists of four instruments: the RER, the conduct adjustment declaration (CAD), the Recovery Project for Degraded and Changed Areas (Prada) and the environmental reserve quota (ERQs), when applicable.

Brancalion et al. (2016) stated that the main setbacks resulted from the new legislation were the granting of an amnesty of fines imposed for violations of the previous law, permission to maintain agricultural activities and infrastructure of protected areas without the need for full recovery of native vegetation and removal of protection from environmentally sensitive areas. Tambosi et al. (2015) emphasized, as a negative aspect, the reduction of native vegetation protection in each relief position (slopes, hillsides, flat areas), which play important environmental functions, highlighting hydrological regulation.

7. FINAL CONSIDERATIONS

The importance of issuing legal standards for environmental protection is acknowledged, however, they do not provide sufficient protection to ensure the conservation of the nature. The revisions of the Brazilian Forest Code increased the restrictions over the years until the current legislation, in which the arguments for smaller restrictions were valued. What remains as an infraction, after the amnesty of an immense

environmental liability, must be effectively regularized. Are environmental agencies prepared, equipped and well managed to monitor it rigorously? Are RER and ERQ processes advanced or do they provide future flexibilities? Are the commitment terms just to serve another bureaucracy?

Besides being more rigorous in complying with the law, it is necessary to consider these new instruments of environmental regulation so that there are no recurrences in the reformulation of the law in order to be met, as has been occurring over the years in environmental legislation. It seems clear that the "rural environmental registry" tool has made the regularization system less bureaucratic and more technical-specialized, allowing for recovery and monitoring actions. However, it is suggested that "SICAR", besides serving as an instrument of environmental conservation, can serve as a modern tool for property's environmental management to ensure sustainable agriculture in Brazil. In this respect, there should be a greater integration of environmental protection agencies with agricultural promotion agencies, since it is not possible to dissociate agricultural development from environmental conservation.

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