



# Land Governance in an Interconnected World

ANNUAL WORLD BANK CONFERENCE ON LAND AND POVERTY  
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## THE AGRARIAN REFORM SETTLEMENTS REGISTRATION EXPERIENCE IN THE RURAL ENVIRONMENTAL REGISTRY (CAR) IN BRAZIL RESULTS AND OUTLOOK

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## **Abstract**

The new Forest Code, introduced by the Law 12,651/2012, established the environmental regularization of rural properties through the property registration in the Rural Environmental Registry - CAR and adherence to the environmental Regularization Program by signing a agreement. On the 5th May, 2014 began counting the legal deadline of one year for the Rural landholdings to register on CAR. Registration deadline count resulted in a big challenge for the National Institute of Colonization and Agrarian Reform - INCRA. Land agency, manager more than 7000 settlements, where hundreds of thousands families of farmers live, in more than 45 million hectares. How to perform the registration of all settlements under INCRA's management, in the original legal deadline? This article analyzes the information declared in the Rural Environmental Registry related to vegetation cover, the settlement projects of agrarian reform.

**Key Words:** Agrarian reform, Rural Environmental Registry, Forest Code, settlements



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## Brief History of the Brazilian Agrarian Reform

The culmination of the agrarian reform agenda in Brazil dates back to the Reform Rally held in Rio de Janeiro on March 13, 1964, when President João Goulart announced the expropriation of lands located along roads, railroads and public works. These measures, instituted through Decree No. 53,700, were revoked one month later by the Military Regime through Decree No. 53,883 of April 13, 1964.

The Land Statute, Law 4504/64, was enacted at the end of 1964 by the military regime, incorporating elements of the old discourse on agrarian reform, accepting the expropriation and redistribution of land, especially in areas marked by social tensions.

The implementation of the Land Statute can be portrayed by the process of colonization of the Amazon, inserted in the context of the National Integration Plan (NIP) and implemented through the Regional Coordinations of the National Institute of Colonization and Agrarian Reform - INCRA. In this process, migrants from various Brazilian states were taken to occupy the banks of the TransAmazon Highway and other highways such as BR 163 and BR 364 and companies from various branches received tax incentives for large agricultural projects. The experience was not successful.

Re-democratization, in 1984, brought back the subject of agrarian reform. Decree 97.766 of October 10, 1985, established a new National Plan for Agrarian Reform - PNRA, with the utopian goal of allocating 43 million hectares for the settlement of 1.4 million families until 1989. The Ministry for Development and Agrarian Reform (MIRAD) was created, but four years later the numbers achieved were modest in comparison to the target: 82,689 families on settled on just under 4.5 million hectares.

There is no doubt that the agrarian reform question progressed significantly in legal terms with the 1988 national constitution. With the constitutional provisions of articles 184, 185 and 186, the INCRA became an important instrument for significant changes in the structure of land ownership (ARAÚJO, 2001). By becoming part of the national constitution, the country's maximum law, agrarian reform permanently entered the country's agenda.

Law 8629/93 regulated the constitutional provisions that deal with the expropriation of rural properties for agrarian reform. With growing demand for land rights from social movements and the publication of the regulation, there was a boom in new settlements.

Between 1993 and 1998, the area of agrarian reform in Amazonia reached 1,168 settlement projects, totaling 30,625,316.85 hectares with capacity for 379,240 families. The expropriation for social



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use, instituted by Law 8.629 / 93, was determinant for the increase of the PNRA area in the Amazon. In five years, it more than doubled the agrarian reform land area in the region and the capacity to settle families. The growth in the number of settlements created was almost exponential - from 295 projects in 1992 to 1,168 in 1998 - an increase of 395% (INCRA, 2012).

## **Formation of the Environmental Regularization Agenda for Land Reform Settlements**

In response to the pressure on the use of natural resources imposed by the vertiginous growth of the creation of agrarian reform settlement projects, the Ministry of the Environment framed the Agrarian Reform Settlement Projects as an agricultural activity subject to environmental licensing as set out in Annex I to the Environment National Council - CONAMA Resolution No. 237 of December 19, 1997.

In 2001 CONAMA Resolution 289 was issued, which established guidelines for the environmental licensing of Agrarian Reform Settlement Projects Resolution/Conaman°289/2001. The CONAMA Resolution represented a legal framework of fundamental importance for the understanding compatibility between governmental policies, agrarian reform and the environment. "

In December 2006, CONAMA Resolution No. 289/2001 was revoked and CONAMA Resolution No. 387, of December 27, 2006, was published with some advances, notably the simplification of instruments for requesting licenses.

No doubt the standardization of settlement licensing contributed to the maturation of the environmental issue in the agrarian autarchy, but six years after the publication of CONAMA Resolution 387/2006, it was confirmed that the methodology for the licensing of agrarian reform settlements did not obtain the expected results. In a diagnosis carried out by INCRA, between 2006 - 2012, of the 6,855 Agrarian Reform Settlement Projects that needed to be licensed, only 1,831 were duly licensed.

The lack of licensing of agrarian reform settlements could be attributed to the absence of a clear instrument for environmental regulation in the Forest Code at the time (Law No. 4.771 / 65). Accordingly, CONAMA Resolution 387 dealt with both the licensing of productive activities and the implementation



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of infrastructure, as well as the regularization of Legal Reserve(RL)<sup>1</sup> and Permanent Preservation Areas (APP)<sup>2</sup> within the same regulation.

Created through Law 12.651 of May 25, 2012 of the new Forest Code, the Rural Environmental Registry (CAR) aims to integrate the environmental information of rural properties and possessions, composing a database for control, monitoring, environmental and economic planning and combating deforestation, being mandatory for all rural properties. Thus, contrary to the provisions in the previous Forest Code, Law 4771/65, the CAR is a clear and efficient instrument for environmental regularization, present in the current legislation:

*"Art. 29. The Rural Environmental Registry (CAR) is created within the framework of the National Environmental Information System (SICAR), an electronic national public registry, mandatory for all rural properties, with the purpose of integrating the environmental information of rural landholdings, composing a database for control, monitoring, environmental and economic planning and combating deforestation. "*

Within this context, it was natural to change the old environmental licensing process of agrarian reform settlements. The publication of the CONAMA Resolution 458/2013 breaks with the previous methodology of environmental licensing of agrarian reform settlements by revoking CONAMA Resolution 387/2006 and bringing in the need to license agro-silvopastoral activities and infrastructure in settlements instead. and no longer the agrarian reform settlement project. The landholding will thus have its environmental regularity assured based on the provisions of the Forest Code of 2012, that is, through

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<sup>1</sup> Legal Reserve: an area located inside a rural property or possession, with the purpose of ensuring the sustainable economic use of the natural resources of the rural property, assisting in the conservation and rehabilitation of ecological processes and promoting the conservation of biodiversity, as well as shelter and protection of wildlife and native flora. All rural properties must maintain an area with native vegetation coverage, as Legal Reserve, with the following minimum percentages being maintained in relation to the area of the property: localized in Legal Amazon: a) 80% (eighty percent), in the property located in a forest area; b) 35% (thirty five percent), in the property located in a closed area; c) 20% (twenty percent), in the property situated in an area of general fields; located in other regions of the country: 20% (twenty percent).

<sup>2</sup> APP: protected area, covered or not by native vegetation, with the environmental function of preserving water resources, landscape, geological stability and biodiversity, facilitating the genetic flow of fauna and flora, protecting the soil and ensuring the well-being of human populations;



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its registration in the CAR and subsequent adhesion to the Environmental Compliance Program - PRA, by signing a term of commitment.

The Environmental Regularization Programs (PRAs) comprise the set of actions or initiatives to be developed by rural landowners and settlers with the objective of adjusting and promoting environmental regularization related to the irregular suppression of native vegetation in the consolidated areas (areas in use that have been deforested until July 22, 2008) in Areas of Permanent Preservation, Legal Reserve and Restricted Use. It should be noted that enrollment in the CAR is a mandatory condition for joining the PRA.

Registration, as well as the process of environmental regularization is managed by SICAR - Electronic system of national scope for the management of environmental information of rural properties throughout the country.

Decree No. 7,830, of October 17, 2012, which regulated the forest code and established general rules for the Environmental Regularization Programs, defined in its art. 21, that the Minister for the Environment would establish the official deadline for CAR registration and this was defined as within one year from May 5, 2014, with the publication of Normative Instruction 02/2014 MMA

## **A challenge the size of Brazil**

This deadline was a huge challenge for the National Institute of Colonization and Agrarian Reform – INCRA, with more than 7,000 settlements, where hundreds of thousands of farmers' families live on more than 45 million hectares, trying to carry out the registration of all the settlements under management of the autarchy, within one year.

The Normative Instruction 02/2014 MMA framed the agrarian reform settlements in a Special and Simplified Registration Regime. Once the settlement rules were established, INCRA began to mobilize for the inclusion of more than 7,000 settlements in the SICAR base.

The task consisted of the organization of cadastral data, such as land registries and data of beneficiary families, as well as the geospatial information provided for in the forest code, such as the Consolidated Areas (AC), Remnants of Native Vegetation (RVN), hydrography, legal reserves and areas of permanent preservation (APPs), etc.



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During July 07-11, 2014, an INCRA mission visited the LEMAF - Forest Management Laboratory, Federal University of Lavras - UFLA. The week of concentrated effort had as its objective the presentation of problems encountered with the platform for the registration of settlements in the SICAR and to obtain information on the progress of the work on classification of land cover for application in the SICAR. The opportunity was taken to create a mass registration methodology for agrarian reform settlements in the SICAR. In order to carry out this mass registration on Agrarian Reform Settlement Projects, INCRA and UFLA paired up to enroll all federal agrarian reform settlements in CAR within the limited time available .

## **Mass Registration Methodology for Agrarian Reform Settlements**

The work methodology was constructed in four steps: 1) Survey of the cadastral data and spatial boundaries of the settlements, 2) Extraction activities within the limits of the settlement of the features of the land use mapping, 3) Insertion of the data in the module of "Agrarian Reform Settlements " and 4) Proposition for the definition of the Legal Reserve.

The data collection and spatial limits of the settlements was carried out in the 30 regional superintendencies of INCRA and sent to UFLA. With the material organized in hand, the UFLA team began the mass registration work of agrarian reform settlements. The data entry in the project started with the settlement area provided by INCRA, and the respective scenes of the Landsat 2008 and Rapideye 2011 images. As a final product of the process of remote sensing and extraction of features of the land use mapping of the settlements, the following categories were generated: Remaining native vegetation 2008 and 2011, Consolidated areas (deforested before July 22, 2008), Anthropogenic areas (2011), Regenerated areas (2008 - 2011) and Water bodies.

With the registration data of the settlements, their respective limits organized and with the extraction of the land cover layers<sup>3</sup> from the limits provided, the partnership between INCRA and UFLA carried out the task of registering, in a little more than 10 months, 7105 settlements , benefiting more than 700,000 families in an area of more than 46 million hectares.

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<sup>3</sup> Soil cover layers extracted from satellite imagery through remote sensing



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## Establishing a settlement sample

For this study, some parameters were established in order to make the sample more homogeneous. To that end, only the settlements with the SIPRA<sup>4</sup> code duly completed were extracted from the CAR database. From that point on, the settlements that had the remnant features of Native Vegetation (RVN) and Consolidated Area (CA) were selected. In this way, the sample consisted of 6494 features registered in SICAR as Agrarian Reform Settlements Type Property<sup>5</sup>, covering an area of 34,794,296.4975 hectares.

The RVN and AC data obtained in the extraction were organized by states and compared to the total values of the registered area of the settlements, in order to obtain the percentage contribution of each feature analyzed in the composition of the soil cover. Data was grouped by classes of total area registered. A group of Federation Units with a total registered settlement area above 1,000,000 ha has another group with total registered settlement area within a range of 250,000 ha to 1,000,000 ha and a last group with total registered settlement area of less than 100,000 ha.

It should be noted that data from the States of Mato Grosso do Sul - MS, Espírito Santo - ES and São Paulo were not recorded. These states have their own systems<sup>6</sup> and no specific input port for the settlement data.

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<sup>4</sup> Code for the Settlement Project in the Information System for Agrarian Reform Projects - SIPRA - INCRA

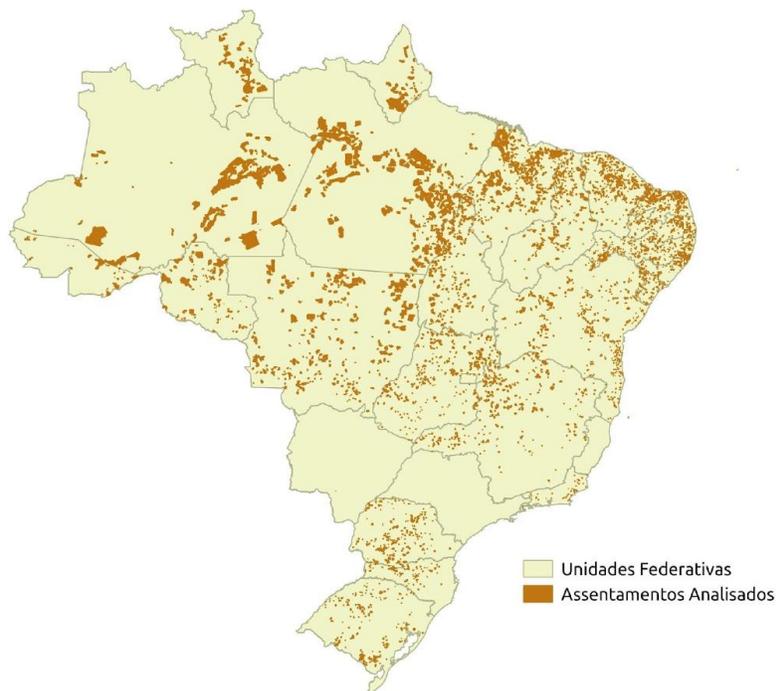
<sup>5</sup> The SICAR registration module has three data entry ports. An Agrarian Reform Settlements, another for and Traditional Communities Territories and finally the gateway to rural properties.

<sup>6</sup> Systems developed by the States in technology different from SICAR, but with the obligation of data integration.



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**Figure 1. Map of the analyzed sample**

## Results

In absolute terms, in relation to the Total Registered Settlements Area, the Federation Units that make up the Brazilian Legal Amazon<sup>7</sup>, all with a settlement area registered in excess of one million hectares, with the exception of Acre, with 435,602,3174 hectares registered, stand out. Figure 1 shows the values of the total area of settlements registered by the Federation Unit.

When we look at Figure 2, the percentage of RVN declared, we noticed that with the exception of Mato Grosso - MT, all other states of the Legal Amazon have more than 50% of the area of agrarian reform settlements registered in SICAR covered by Remnant of native vegetation. The states of Amapá -

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<sup>7</sup> Legal Amazon: The Brazilian states of Acre, Pará, Amazonas, Roraima, Rondônia, Amapá and Mato Grosso and the regions northward from the 13° S parallel at the states of Tocantins and Goiás, and westward from the 44 ° W meridian at Maranhão state.



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AP, with 97% of the declared area covered by RVN and Amazonas - AM, stand out. Even though Amazonas is under great pressure from deforestation in settlements in the South of the State, it still presents a very high percentage of vegetation cover in settlements, 95%.

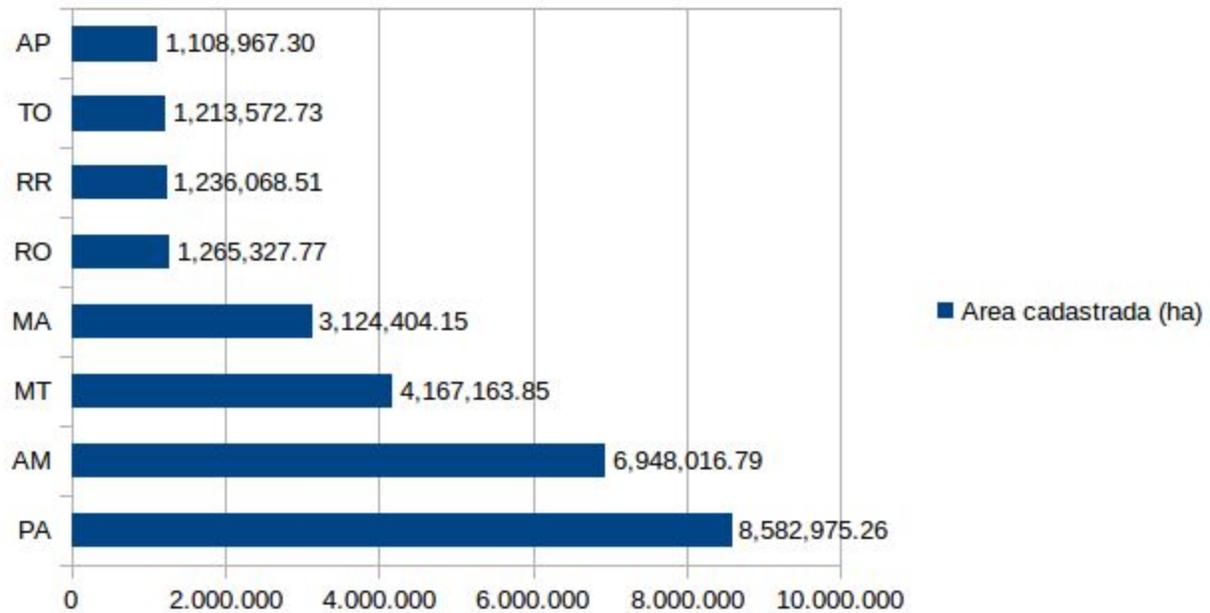
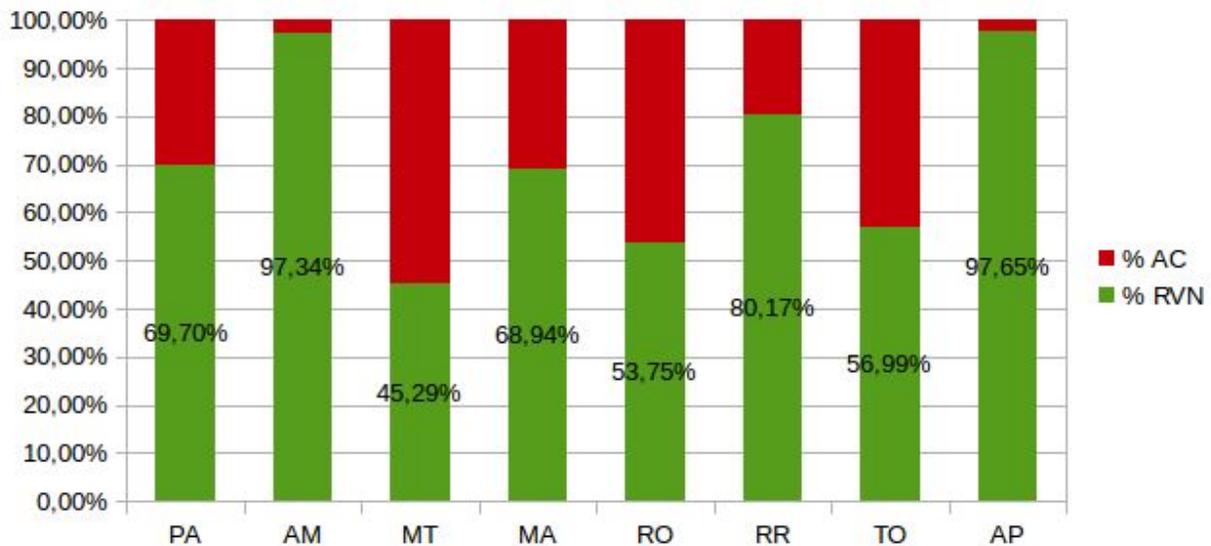


Figure 2. Total settlement area per state.





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The results indicate an Intermediate Group of Units of the Federation in relation to the total area registered. The values of the areas registered by the settlements in these states are in a range greater than 250,000 ha and less than 1,000,000 ha. The 11 federative units of this group spread through much of the Brazilian territory and cover different Biomes. Highlighted are Bahia - BA, Piauí - PI, Ceará - CE, Goiás - GO and Minas Gerais - MG, all with settlement areas totalling more than 800,000 ha. Figure 4 shows the values of the total area of settlements registered by the Federation Unit.

With the exception of the representatives of the South of the Country, Paraná and Rio Grande do Sul, the other states of this Group, independent of biome or geographic region, have more than 50% of vegetation cover in the settlements in relation to the declared total area. Above 70% of Remaining Native Vegetation declared in relation to the total registered area of agrarian reform settlements are the states of Ceará - CE (87%) Piauí - PI (89%) and Rio Grande do Norte - RN (71%). and Bahia (70%). Even in the states with land use consolidated by intense agricultural activity such as the states of Minas Gerais MG (56%) and Goiás - GO (53%) there is more than 50% RVN. In this group, the states of Paraná - PR (28%) and Rio Grande do Sul - RS - (15%) both have a large percentage of consolidated areas. Figure 5 below presents the data for this group.

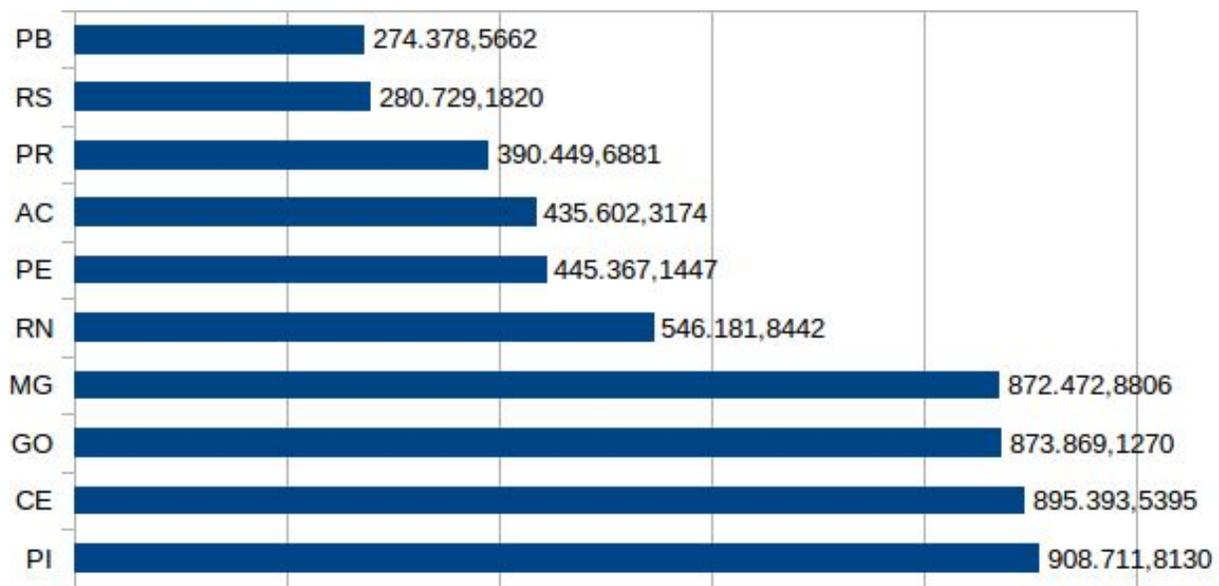


Figure 4 Total settlement area per state



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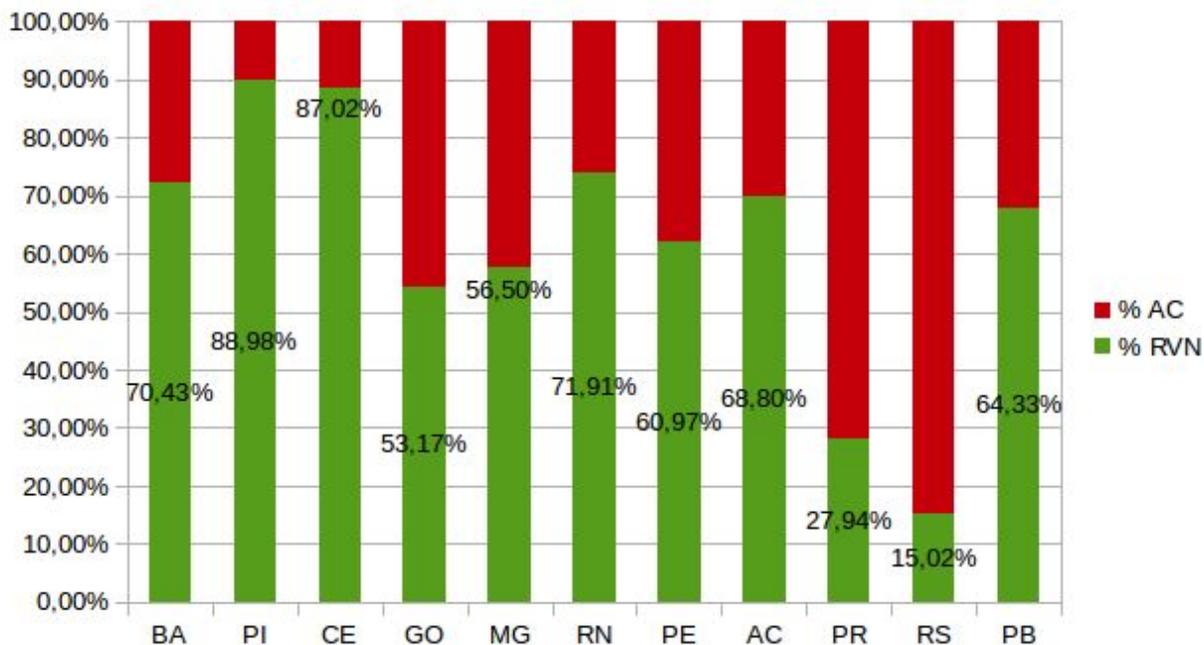


Figure 5 Percentage of RVN and AC declared in relation to the total registered settlement area registered by state

The last group studied is composed of Federative Units with registered area less than 100,000 ha. In this group, several Brazilian regions and biomes are represented in the states of Alagoas - AL, Santa Catarina - SC, Sergipe - SE, Rio de Janeiro - RJ and the Federal District - DF. The graph below shows the values of the registered area of agrarian reform settlements by state. AL and SC exceed the ninety thousand hectares registered, with RJ being the state with the lowest registered area of settlements in the country, being ahead only of the DF with its little more than 3 thousand hectares registered in settlements.

For the group of states with the lowest registered area, the lowest vegetation cover rate was also found. Only the State of Sergipe presented a percentage of RVN above 50%. Rio de Janeiro and Santa Catarina presented percentage of RVN in relation to the total registered area of settlements of the agrarian reform smaller than 30%.



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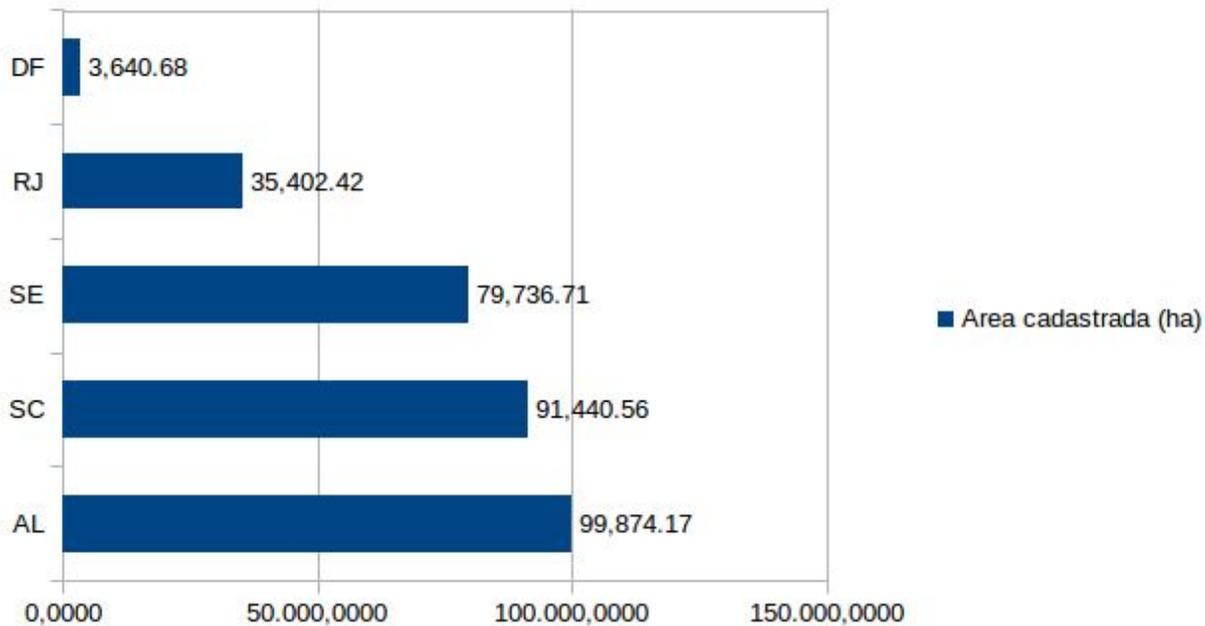


Figure 6 Total settlement area per state

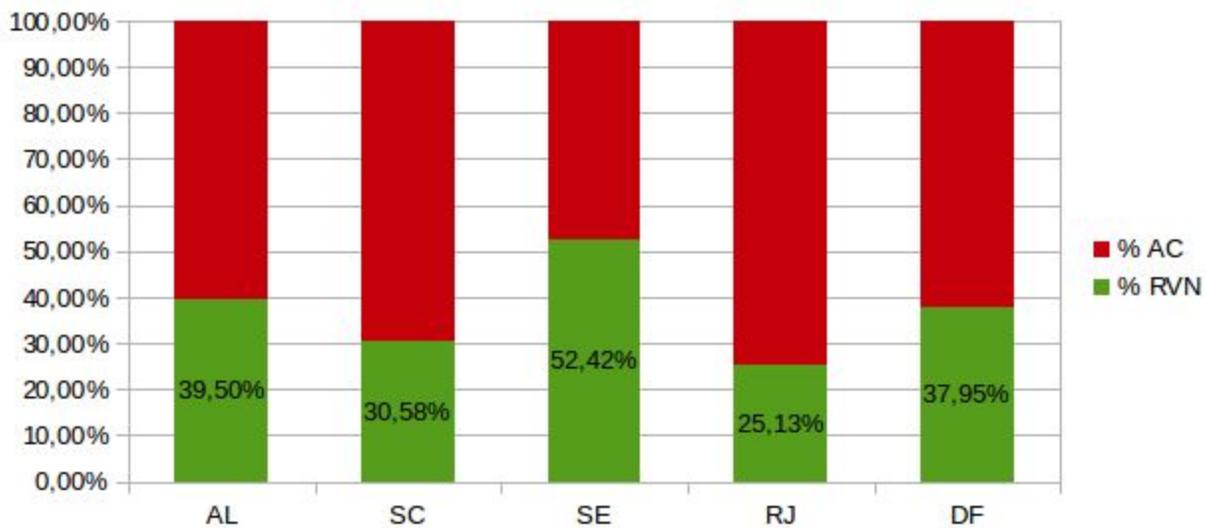


Figure 7 Percentage of RVN and AC declared in relation to the total area of settlements registered by state



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## Conclusion

After analysis, it was verified that the percentages of native vegetation remnants registered in SICAR in relation to the total area registered in the agrarian reform settlements were satisfactory either per geographic regions or per biome, in which the settlements are inserted.

Only in four Brazilian states, of the southern region (PR, RS and SC) plus Rio de Janeiro, did agrarian reform settlements have remnants of native vegetation of less than 30% of the total area declared in SICAR. Only RS presented a percentage of RVN lower than the legal limit of 20. In states with land use consolidated by intense agricultural activity such as the states of Minas Gerais MG (56%) and Goiás - GO (53%) there is still more than 50% of RVN.

On the other hand, it is verified that in states like Piauí, Ceará, Rio Grande do Norte and Bahia, all of the Brazilian northeast, that there are very high percentages of remnants of native vegetation in agrarian reform settlements, more than 2.6 million hectares of native vegetation under the domain of INCRA and in concession with the public beneficiary of the agrarian reform. An incredible environmental asset, now mapped by the Rural Environmental Registry. For these states there remains a clear forest vocation for settlements where the remnants of native vegetation can and should be managed by offering more income options to the farmer using environmentally sustainable practices like sustainable forest management.

Based on the registered data, in the states that compose the Legal Amazon, there are almost twenty million hectares of RVN. A true environmental patrimony in state of permanent pressure for vegetation suppression in the conversion of the use of the land. As is the case with settlements in the State of Amazonas, despite having 95% of the registered area covered by RVN, the pressures for deforestation in the southern settlements is critical.

In all, there are more than 24 million hectares declared in SICAR as remnants of native vegetation that cover the 6494 settlements registered in SICAR in all regions, in all Brazilian Biomes.

The most important insight is that the millions of people who make up the more than six hundred thousand families that make up the beneficiary population of agrarian reform, interact daily with the use of natural resources on these settlements. This great environmental patrimony should be valued both by the beneficiaries of the agrarian reform and by the public managers who formulate and implement national agrarian policy.



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The first step was taken, this fantastic mapping of the land cover of agrarian reform settlements, whose purpose is to start the process of environmental compliance instituted by the new Brazilian Forest Code. Yes, the priority is to comply with the Forest Code and f environmental compliance, but also to generate opportunities and promote a sustainable forestry-based economy.

At a time of global climate change concern, with alternatives being built to consolidate a green economy, managers of Brazilian agrarian policy must pay more attention to our forests, applying technical assistance that involves the forest agenda, rural credit that promotes multiple forest management, and Payment for Environmental Services - Green Funds and Green Bonds are there asking to be accessed!

It is necessary for policy makers to realize that the forest is a great asset that guarantees the maintenance of the human species, the conservation of natural resources, income generation, water and food security. In a country with a tree name (Pau Brasil) it would be natural for forest policy to be a national priority. Rural Environmental Cadastre numbers point the way ... and there is no turning back.



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