



SHADES OF GREEN (III)

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Evaristo De Miranda

Sustainable Agriculture in Brazil

CHAPTER 3 – ENVIRONMENTAL PROTECTION AND PRESERVATION

A COMPARISON WITH THE USA

Embrapa Territorial recently compiled a comparison between Brazil and the United States of America (USA) regarding land use and occupation, with emphasis on the maintenance of native vegetation. This comparison on relatively homogeneous bases sought to make compatible, as far as possible, the categories of use and occupation employed by the agencies responsible for such studies in both countries.

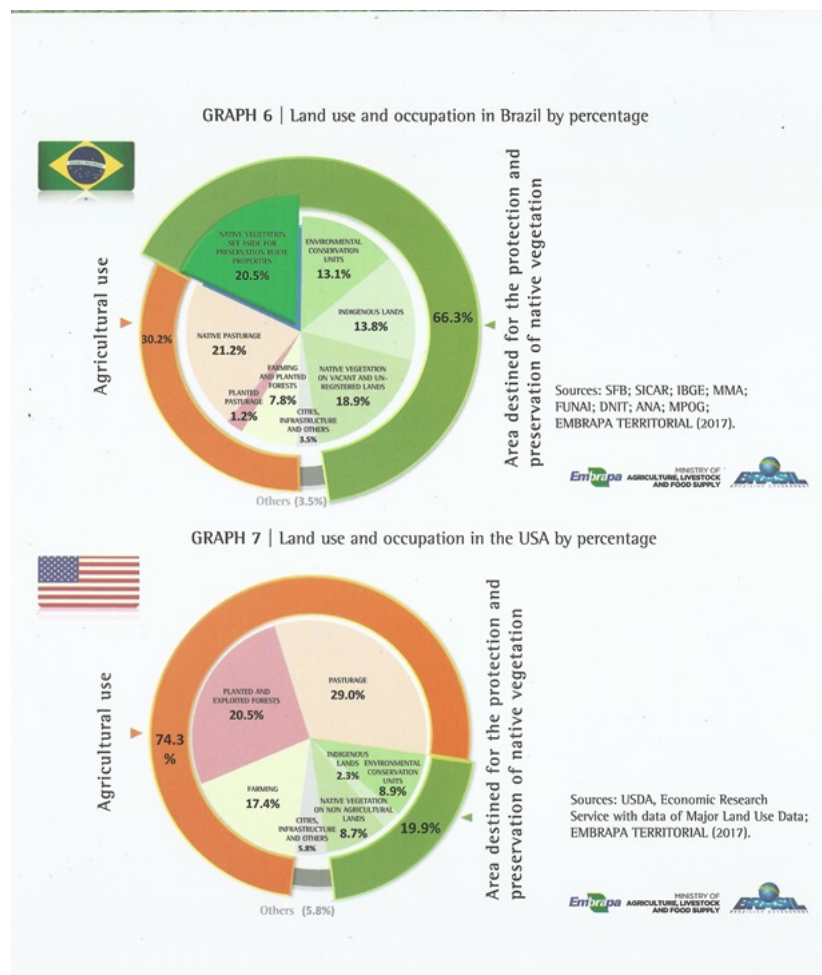
The situation of the allocation, use and occupation of land in the two countries is very different, for historical, social and economic reasons. Regarding the various forms of land use, Brazil's slice (Graph 6) is always smallest than in the USA (Graph 7). In Brazil, the portion devoted to the various agricultural uses of the land is 30.2% of the national territory, whereas in the USA, the total land utilized is 74.3%.

In terms of areas destined for the protection and preservation of native vegetation, the amount in Brazil is always much larger than in the USA, despite the latter's tradition of conservation and its pioneering in some areas of this theme. In total, the USA dedicates 19.9% of its territory including Alaska – to the preservation and protection of native vegetation, whereas Brazil sets aside 66.3%[1]. This is without evaluating the qualitative issue of protected areas, which is also very different in both countries, with more desert and ice-covered regions in the USA, and more forests and jungles in Brazil. They are shades of green that cannot be compared.

[1] MIRANDA, Evaristo E. de. *Vegetação protegida*. Portal DBD, 04/10/2017. Available at: <http://www.portaldbo.com.br/Agro-DBO/Chamadas/Vegetacao-protegida/22491>. Access in Oct. 2017.

A COMPARISON WITH THE REST OF THE WORLD

And what is the size of the areas cultivated in the different countries of the rest of the world? Data on this topic depend essentially on national statistics that do not always use the same methodology, and rarely expressed cartographically. However, recent work by the USA space agency (NASA) and the US Geological Survey (USGS) has changed that. In November 2017, these two agencies published an extensive study



Canyons and mountains border Campos de Cima da Serra, São José dos Ausentes, RS

mapping and calculating the cultivated areas of the planet, based primarily on monitoring by the Landsat 8 satellite[2].

The Earth was minutely scanned with 30-meter detail for over two decades by researchers from the Global Food Safety Analysis – Support Data at 30 meters (GFSAD30[3]). This project sought to foster food safety on the planet. Measurements were taken: extension of crops, irrigated and rain-fed areas, intensification of land use with two-crops, three-crops and even continuous cultivation, as well as several other aspects of crop qualification. These areas were separated from those covered with native vegetation (from fields to forests). There were no areas of forest exploitation or forestry planting and reforestation – just crops.

According to the study, the world has 1.87 billion hectares of crops. The world's population reached 7.6 billion in 2017. This means that each hectare, on average, would feed 4 people. In fact, productivity per hectare varies greatly depending on the soil, the climate, and the technology employed, in addition to the type and quality of the crops. This gives rise to large differences in countries' agricultural production.

The largest cultivated areas are in India (179.8 million hectares), the USA (167.8 million hectares), China (165.2 million hectares) and Russia (155.8 million hectares). Together, these four countries account for 36% of the world's cultivated area. Brazil ranks 5th, followed by Canada, Argentina, Indonesia, Australia and Mexico. The

areas of these countries represent the following percentages of the total cultivated on the planet: India 9.6%; USA 8.96%; China 8.82%; Russia 8.32%; Brazil 3.42% – together totaling almost 40% of the planet's cultivated land.

In continental terms, Asia accounts for the largest portion of the world's cultivated area, with 617 million hectares or 33% of the total. Europe, including Russia, accounts for 25.5%, some 478 million hectares. Eurasia accounts for more than half of the world's cultivated areas. In other words, Europe and Asia (especially Southeast Asia) are the planet's agricultural capitals. South America, with 152 million hectares (8.1% of the total) occupies the penultimate position, followed only by Oceania (mostly Australia), with 44 million hectares (2.3% of the total cultivated).

This work interests Brazil for two reasons. First, in 2016, Embrapa Territorial estimated the country's cultivated area to be 65,913,738 hectares (7.8%). NASA calculated the Brazil's crop area to be 63,994,479 hectares (7.6%), nearly the same number.

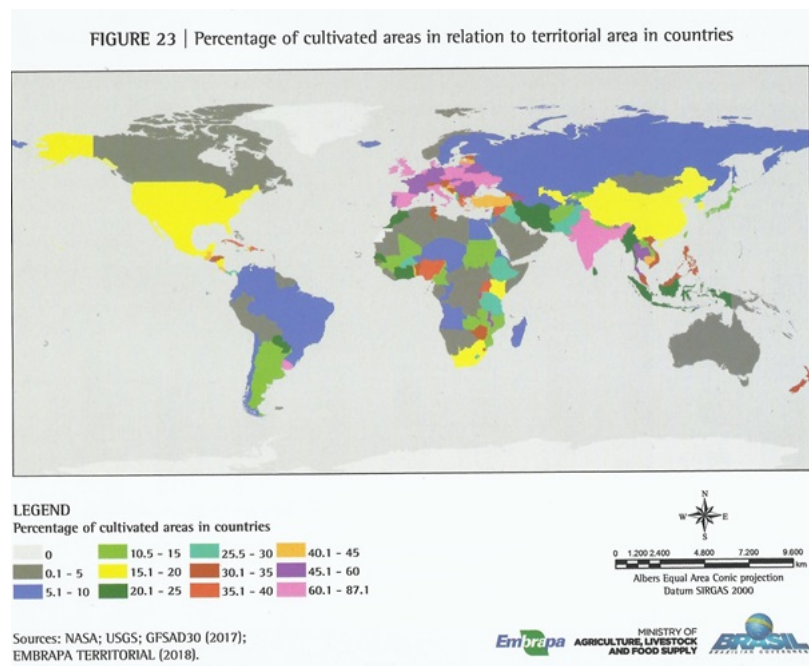
The slight difference is normal. For example, NASA's figures on USA crop areas (18.3% of the country) also show little differences from official US Department of Agriculture (USDA) data (17.4% of the country).

Second, NASA's work is of interest to Brazil because it presents some comparative data between the countries' agricultural use, which deserve special mention. To begin with, the methods employed by NASA and the USGS were homogeneous across the globe, and this guarantees the quality of the comparisons.

Brazil protects and preserves native vegetation on more than 66% of its land area, and it cultivates 7.6% of it. Denmark cultivates 76.8%; Ireland, 74.7%; the Netherlands, 66.2%; the United Kingdom, 63.9%; Germany, 56.9% – and the rest of Europe and so forth, with more than half of its land destined for the agriculture (Figure 23).

Cultivated versus population areas range from about 0.01 hectares per inhabitant in countries such as Saudi Arabia, Peru, Japan, South Korea and Mauritania, for example, to over 3 ha/inhabitant in Canada, the Iberian Peninsula, Russia and Australia. Brazil has a small cultivated area per inhabitant – only 0.3 hectares. The country is in the range of 0.26 to 0.50 ha/inhabitant, as are Mongolia, Iran, Sweden, Finland, South Africa, Chile, Laos, Niger, Chad and Mexico, among others.

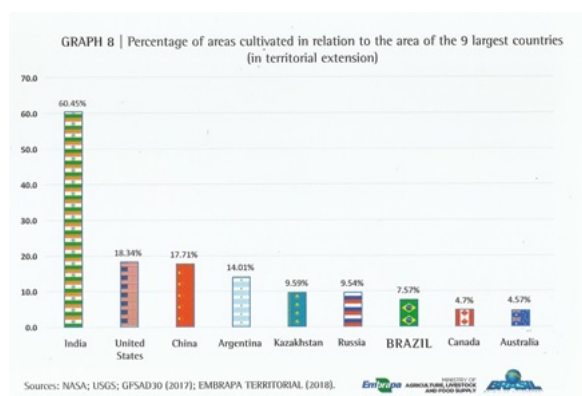
In other words, Europeans have deforested and intensively exploited their territory. Europe – not including Russia – used to have more than 7% of the planet's original forests. Today it has only 0.1%. The sum of the cultivated area of France (31,795,512 hectares) and Spain (31,786,945 hectares) is equivalent to the amount cultivated in Brazil (63,994,709 hectares)! Brazil cultivates as much land as Spain and France together[4].



Most countries use 20 to 30 percent of their land mass for agriculture. Those in the European Union use between 45% and 65%; the USA, 18.3%; China, 17.7%; and India, 60.5%. Brazilian agriculturists cultivate only 7.6% of their country, with a good amount of tropical technology and professionalism. And that alone has made the country a world agribusiness power.

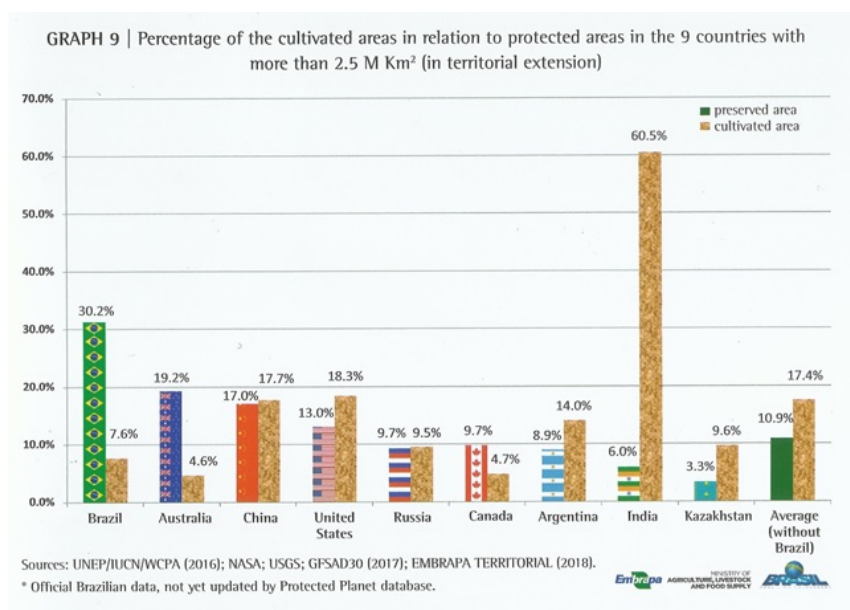
On a graph built with these databases on land allocation, use and occupation, Embrapa Territorial can compare how much of their territory large countries, with more than 2.5 million km², protect and how much they cultivate (Figure 23, Graphs 8 and 9). In spite of being the country that most protects its land area, Brazil is also, in relative terms, the one that uses and cultivates its lands the least. On average, these countries

cultivate 17.4% of their land area and protect 10.9%. In absolute terms of percentage of land cultivated, Brazil loses only to Canada and Australia, which cultivate less than 5% of their territories because they have very large areas that are unfit for agriculture, for essentially environmental reasons (arctic, subarctic and desert climates).



What would Brazil be like if it cultivated three times more – 21% of its land area – as does the rest of the world? Would there be fewer forests, fewer connections between protected areas, less habitat for wildlife? No, not even this would happen if the crops' expansion happened essentially over pastureland, vis a vis the spread of Integrated Crop-Livestock-Forest systems (ICLF). If this growth occurred essentially on pasturelands, this would not even be the case either as the case of the use of integrated crop. In fact, today, this 21% of the national territory is actually the percentage corresponding to the native vegetation preserved by agriculturists within their rural properties!

This issue introduces the next chapter of this book, focusing on yet unknown aspects of the sustainability of Brazilian agriculture, showing its systems of vegetal production and animal husbandry employed in the exploited areas of rural properties. Brazil's sustainable production systems are the result of using technologies and innovations that are specific to tropical agriculture. These developments were obtained by agricultural research, carried out by public and private efforts, since the 19th century.



These innovations, focused on sustainability – the long-term, proper use of natural resources – are the result of a broad interaction between the industrial sector and agriculture. They are not the hallmark of a particular type or category of rural producer. They are present in all Brazilian biomes and in diverse social and economic contexts of rural producers. And they also contribute to the many shades of green of agriculture in Brazil.

Positions and concepts emitted in signed articles are the sole responsibility of their authors.

- [1] MIRANDA, Evaristo E. de. *Vegetação protegida*. Portal DBD, 04/10/2017. Available at: <<http://www.portaldbo.com.br/Agro-DBO/Chamadas/Vegetacao-protegida/22491>>. Access in Oct. 2017.
- [2] USGS. *New Map of worldwide croplands supports food and water security*. U.S. Geological Survey. Available at: <<https://www.usgs.gov/news/new-map-worldwide-croplands-supports-food-and-water-security>>. Access in Feb. 2017.
- [3] USGS. *Global Food Security-Support Analysis Data at 30 m (GFSAD30)*. LIS. Geological Survey. Available at: <<https://geography.wr.usgs.gov/science/croplands/index.html>>. Access in Feb. 2017.
- [4] MIRANDA, Evaristo E. de. O Menino Jesus e o IBGE, a Nasa e a Embrapa. *Estado, Opinião*, 22/12/2017. Available at: <<http://opinio.estado.com.br/noticias/geral,o-menino-jesus-e-o-ibge-a-nasa-e-a-embrapa,70002129295>>. Access in Dec. 2017.



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