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**PRODUCTIVITY IN THE BRAZILIAN AGRIBUSINESS**

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By definition, productivity is an economic indicator that relates the production values with quantities of factors of production used, and is therefore an important indicator for comparative analysis of performance and prospects of enterprises and productive sectors. Traditionally in the agricultural sector, three factors are considered classics: land, labor and capital. In Brazil, until the year 1970, the productivity of labor earned highlight driven by mechanization.

But, from the end of that century, in addition to the productivity of labor, the sector also is experiencing strong productivity gains by other factors, resulting from agronomic research and innovation in areas such as: management and conservation of soil; best use of mechanization; better accuracy in the application of fertilizers, pesticides and irrigation; integrated and biological pest management; direct planting; biological nitrogen fixation; crop-livestock-forest integration; new cultivars; best and most economical health management of the herd. And also register a growing application of methods of environmental preservation, such as: planted forests and treatment of animal excrements.

Which explains, in large part, this performance is a structural change in which the work factor has been progressively replaced by capital and modern inputs, provided by research and innovation, including in property management, because the agricultural frontier began to become scarce, by costs and/or logistics, or by pressure environmentalist.

However, it is known that these gains are still concentrated in only one part of the sector, what on the one hand is a negative aspect, but on the other hand, means that has a vast field to be modernised with the increase in productivity. According to the Project Terra Class<sup>1</sup>, of the Embrapa, the cleared area in the Legal Amazon, in 2014,

762.464 km<sup>2</sup>, twice the area of the State of Maranhão, indicates the space for modernize the agriculture, and more, without advance on the forest.

In this respect, the productivity of agriculture in Brazil is only 7% of the North American and Australia; 10% of France; 17% of Ireland; 19% of Great Britain; 20% of Korea; 26% of Japan. It is only higher than that of China and India.<sup>2</sup>

But by focusing on the productivity gain, ask yourself? What are the productivity gains in the future? From 1980 to 2010, for example, productivity growth in the Brazilian agribusiness responded by 77% in productivity growth in the economy.

In the historical series from 1900 to 2016 there will be a percentage of the value added (VA) of agriculture in value added total economyw represented 19%, until the mid 1970s, when it came to 4%, recovering part of the loss from approximately 1990, arriving in 2016 to 7%<sup>3</sup>.

Even so, the index of agricultural productivity is multiplied 3.7 times from 1975 to 2010, twice the speed observed in the United States. The increase in productivity in Brazil corresponds to an average growth of 3.6% per year over 35 years, discounted simultaneous increases in the total amount of costs in the field, between labor, machinery and other. The results are the result of research of the Economic Commission for Latin America and the Caribbean (ECLAC)

The authors, Armando Fornazier (Unicamp) and José Eustáquio Vieira Filho, (Ipea), show that agricultural productivity calculated in the study refers to increasing the amount of product that is not explained by increasing the amount of inputs, but by gains in production efficiency, which depends basically of scientific and technological development.

According to the authors, the modernisation of the agricultural sector is spent at a later date to American agriculture. *"In Brazil, the mechanization of the field and the use of modern inputs, as well as the advancement to new frontiers, as the Midwest, only came to occur in the years 1980, complementing national planning research corporation since the foundation of the Embrapa in 1973"*.

Also according to these authors the growth of productivity, occurred after the economic stabilization in the 1990s, driven by credit supply and government programs. The policies, according to the study, were kept, which gave the advance of agribusiness.

The productivity of Brazilian agriculture has one of the highest rates of growth of the world in recent years, according to a study conducted by the Organization for Economic Cooperation and Development (OECD) in conjunction with the Food and Agriculture Organization of the United Nations (FAO). The report "Agricultural Perspectives OECD FAO 2015-2024" says that, if the Bric countries (Brazil, Russia, India, China and South Africa) and the members of the OECD, which brings together mainly developed economies, *"Brazil is the country that has improved their total productivity of factors (TPF) agriculture"*.

The TPF refers to the relationship between the total produced and the total number of inputs, which characterizes the productivity. In Brazil, agricultural productivity has increased by more than 4% since the beginning of the 2000s, according to the document.

The report also mentions an analysis of the Ministry of Agriculture of the United States, which compared the rates of agricultural productivity growth between 2001 and 2010 and placed Brazil in the 12th position among 172 countries.

*"The long-term investments in agricultural research, which has enabled the United States to develop cutting-edge technologies for tropical agriculture, are among the factors that stimulated the growth of productivity"*, The report, noting that it has created a *"more competitive environment"*, which encouraged producers to increase their productivity and adopt innovations.

The prospects of Brazilian agriculture for the next decade are *"favorable"*, according the study, despite of the *"possible slowdown in growth of internal and external demand and falling real prices (less the inflation) of most agricultural products in relation to record levels recorded recently"*.

According the two organizations, the internal and external markets are expected to grow over the next decade, and this demand must favor the products in which the United States is more competitive, as meat, corn and oilseeds, sugar and tropical fruits, i.e., the brazilian agriculture will contribute greatly to the creation of jobs, the formation of income and export earnings.

At the same time, the OECD and FAO noted that the need to reduce production bottlenecks that hinder productivity is one of the "strategic challenges" of agriculture in the country. *"The improvement of logistics and infrastructure and transport is a key priority. This would reduce the costs of producers to export and would benefit all farmers, facilitating the access to the internal market"*, says the report.

According to the study, future growth of Brazilian agriculture depends on the consolidation of the gains in productivity, linked to the improvement of the use of crops, in addition to the transformation of some damaged pastures on cultivated land and the intensification of animal production.

The soybeans should continue to be the main agricultural product of Brazil. The country, which is the second largest producer of soybeans in the world, could increase their production over the next ten years, reducing the difference that separates it from the United States, the first. *"Among the major producers and exporters of oilseeds, Brazil is the country where the potential for expansion of production is the highest"*, according to the prospects of OECD and FAO.

The productivity gains in agriculture, in addition to increasing the production and gains in the sector, has a special role in the preservation of ecosystems. The big advantage of sustainability is that it goes hand in hand with productivity. When this latest increases, produces more with less. Exemplifying its importance with the report "Living Planet" the WWF, 2016: *"the humanity consumes 60% more natural resources than the Earth can renew"*. This is what the ecology conceptualizes as "Ecological Footprint" 4.

But, in fact, there are still few producers in Brazil, especially in the North and Northeast regions that use new production systems and new technologies for a number of reasons, among them the lack of information, technical knowledge, and even by cultural factors (family tradition). Taking as an example the livestock farming in these regions, if the producers to adopt new systems of production and new technologies, cattle will produce a better quality of younger animals, with greater return on investment, and in a sustainable manner.

It has been a matter of time the adoption, by these regions, new technologies and new production systems, not least because the country has already demonstrated his extraordinary ability to change in their farming. Those who do not modernize will get out of this segment. From the beginning of the 1970s, Brazil has taken important leaps in this sector, which benefited from the condition of importer of food for important player of agribusiness in the world.

This remarkable progress was made on the basis of: field of the Cerrados, by means of the correction of acidity and nitrogen from the soil, and tropicalization of soybean, which is a plant of temperate climate; the direct planting; the biological nitrogen fixation, the consolidation of the Zebu cows as an array of national herd; the

expansion and importance of Brachiaria pasture and planted; the introduction of the small crop; and crop-livestock-forest integration , which is a mixture of all of this.

#### NOTE

1 The project generates data from deforestation in the region in 12 separate categories, with emphasis on: secondary vegetation, agriculture and pasture.

2 VELOSO, F; MATOS, S; FERREIRA, P. C; B. COELHO, B.. “O Brasil em comparações internacionais de produtividade: uma análise setorial”. BONELLI, R; VELOSO, F; PINHEIRO, A. C; (org.). *Anatomia da produtividade no Brasil*. Rio de Janeiro: IBRE/Elsevier, 2017, p. 63-107. Cap. 3.

3 <http://www.brasil.gov.br/infraestrutura/2017/05/agropecuaria-brasileira-e-uma-das-que-mais-cresce-no-mundo>

4 It is the amount of soil and water productive biologically necessary for supply a population with renewable resources it uses and to absorb or eliminate waste from the use of such resources. It is a measure of the impact of populations in different countries and areas.