INSTITUTE OF APPLIED RESEARCH IN SUSTAINABLE ECONOMIC DEVELOPMENT – IPADES

CULTIVATE AND PRESERVE DO NOT EXCLUDE

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In the course of the evolutionary process arose cells that were capable of making your own molecules rich in energy from inorganic materials. Such bodies are called autotrophic. The most successful among the autotrophic were those who developed a system to make direct use of solar energy, i.e., the process of photosynthesis.

The autotrophic organism – plants, algae and bacteria that undergo photosynthesis – form the basis of the productivity of all ecosystems. These ecosystems are the animals and the human species that are heterotrophic, because their energy requirements arise from the consumption of organic compounds produced by external sources, i.e., the autotrophic organisms.

The species *Homo sapiens* arose there are approximately 200 thousand years. If differentiated, in the evolutionary process, of the *Homo neanderthalensis* and the *Homo erectus* by reasoning skills, manipulation, deceit, intrigue, creativity, persuasion, speculation, fantasy and logic, And especially, the ability to speak with fluency, which enables the transmission of knowledge and ideas, the expression of emotions, the planning, the consciência[1]. This evolution is known as Cognitive Revolution, and dated approximately 70 thousand years.

The environmental changes that occurred at the end of the Pleistocene, there are approximately 10 thousand years, were probably the most important factors for the onset of agriculture. The transition from the man hunter-collector for farmer has allowed the establishment of human groupings at fixed locations. Food production on a larger

scale and the possibility of shorter cycles between the human births have resulted in a significant population growth. These factors have also led to the improvement of the technology, based on the greater free time provided by on excess food. These conditions also contributed to the division of labor. This phase of the evolution of the human species is known as the Agricultural Revolution.

Agriculture is down in the fundamental principle of photosynthesis, which makes the conversion of light energy into chemical energy in the production of carbohydrates from carbon dioxide and water in the presence of chlorophyll. This means that there is no agricultural production in shaded area – in the forest. This condition establishes the need of removing vegetation cover originating for the installation of the agriculture.

This natural situation, combined with the availability of frontier to be occupied, population growth, the slow process of generation of agricultural technology, and the lack of studies on the ecology dictated the modus operandi of the agriculture from its origin until the second half of the 20th century.

Thus, areas for holding corporation were opened without any kind of planning which threatened to safeguarding the environment. On the contrary, the priority areas to be cleared for the use of agriculture have focused strategically on the banks of the rivers, taking these as sources of water for the sustenance of the activities. In addition, agricultural pesticides from chemical basis began to be used in increasing scale in agriculture. This situation would establish the confrontation between agriculture and environmental preservation.

In September 1972, the marine biologist Rachel Carlson launched its historic book, Silent Spring. The book has documented the deleterious effects of pesticides on the environment, particularly in bird. Carson said that he had been discovered that DDT caused a decrease in the thickness of the shells of eggs, resulting in reproductive problems and death. Also accused the chemical industry of spreading misinformation, and, if you accept the arguments of this industry so little criticism. This book is regarded as the service of the environmental movement, when the alert about the need of environmental preservation began to be presented to the world society.

The consequences of environmental imbalance are today widely studied by scientific institutions around the world, and increasingly concerned the global community, leading to the United Nations Organization (UNO) the position itself through of the Conference of the Parts (COP), the Convention-Four of the United Nations on Climate Change. The COPI 21 in December 2015, in Paris had as objective

the reduction of greenhouse gases (GHG), keeping the global average temperature increase in well under 2° C Above pre-industrial levels and send efforts to limit the rise in temperature to 1.5°C above pre-industrial levels. This agreement was signed by 195 countries.

The corporation has an important role in environmental impact, through deforestation, the burning of biomass, the use of pesticides and chemical fertilizers, and issuing GHG. The latter, through the burning of biomass, the rumination of cattle, buffalo, goats, sheep, and the cultivation of rice irrigated by submersion.

To reverse this situation toward the sustainability of agriculture has an important participation in the agronomic research. He was launching, in 1991, the technology integrated crop-livestock (iCL) by the introduction of the system of production known as Barreirão, researched by Embrapa Rice and Beans. It is a technology of recovery/renewal of pastures in consortium with annual crops. The system has evolved and became part of the forestry segment known as crop-livestock-forest integration (iCPF). Currently the integration adds other technologies such as zero tillage (without the use of mechanized tillage of the soil), and the Biological Nitrogen Fixation (which replaces the use of chemical fertilizer in the cultivation of soybean and bean).

Brazil pledged at COP 21, to reduce GHG emissions by 37 percent below 2005 levels by 2025, with an indicative contribution thereafter to reduce these emissions by 43 percent below 2005 levels by 2030. So much, the country is committed until 2030 to make: i) increase by 18% the participation of biofuels in its energy matrix; ii) restore and reforesting 12 million hectares of forests; iii) achieve a participation of an estimated 45% of renewable energies in the composition of the energy matrix; iv) illegal deforestation zero; v) incorporate 5 million hectares of integration system.

During the COP 22, in November 2016, in Marrakech, Morocco, The Working Group on Sustainable Beef (GTPS, acronym in Portuguese) presented at the event “Low Carbon Agriculture Financing: a Competitiveness Agenda” A job with updated data from beef cattle from Brazil and argued that, contrary to what is claimed, the cattle is not the main cause of deforestation in the country.

A study of the Network to Promote Crop-Livestock-Forest Integration shows that Brazil has incorporated 11.48 million hectares with the systems crop-livestock-forest integration and has already fulfilled one of the goals established at COP 21, which establishes the commitment of incorporate 5 million hectares of crop-livestock-forest integration system until 2030. The geographical distribution in hectares this system in

Brazil achieved the following numbers in 2015: Mato Grosso do Sul, 2 million; Mato Grosso, 1,5; Rio Grande do Sul, 1,4; Minas Gerais, 1; Santa Catarina, 0,68; demais Estados, 4,9[2].

In the aspect of the legal framework that seeks a balance between agriculture and environmental preservation Brazil have two important laws: the New Forest Code, Law 12,651 of May 25, 2012; the Plan for the Consolidation of an Economy of Low Economy of Carbon in Agriculture, known as ABC Plan, established by Decree no. 7,390, dated 9 December 2010.

The New Forest Code bring important points within the forest restoration of rural properties, when deals with the areas of permanent reservation (APP, acronym in Portuguese) and legal reserve areas (RL, acronym in Portuguese). The Article 3 establishes what should be seen in relation to the APP. *"Protected area, covered or not by native vegetation, with environmental role of preserving water resources, the landscape, the geological stability and biodiversity, facilitating the gene flow of fauna and flora, protecting soil and ensure the well-being of human populations."*

The analysis of the legal concept of APP shows that these areas are closely correlated to the conservation of locations naturally weakened due to its proximity to water systems (springs, rivers, lakes, ponds, tanks, trails, salted, apicuns, mangroves sandbanks), as well as forms of relief weakened by the tilt (slopes, tops of hills, mountains and hills, edges of trays or plateaus), Forests above 1,800 meters of altitude, whose species are peculiar, and important areas for the protection of biodiversity, ecological processes, soil and human well-being. The APP has differentiated size depending on the width of the natural water course.

Also in accordance with Art. 3° of the same Code, the RL is defined as*: "Area located in the interior of a property or possession, bounded in accordance with Art. 12, with the function to ensure the economical use of sustainable way of natural resources of rural property, assist the conservation and restoration of ecological processes and promote the conservation of biodiversity, as well as the shelter and the protection of wildlife and native flora".*

It is important to stress the sustainable economic use of RL, i.e., it allowed the adoption of practices aimed at economic diversification of rural property free of criminal sanctions when performed in accordance with the law, i.e., exercise the licensing of the activity, your registration in organs of the National System of Environment (Sisnama, acronym in Portuguese), obey the maximum exploitation, among others.

The recomposition of the RL can be performed through the planting interspersed with native species with exotic or fruitful, in agroforestry system. Example: wood production, the species Ipê-amarelo (*Handroanthus serratifolius*), native, and Mogno-africano (*Khaya ivorensis*), exotic; production of fruit Açaí (*Euterpe oleracea*).

In the state of Pará, the Decree 2,099 of January 27, 2010, deals with the maintenance, restoration, driving the natural regeneration, compensation and composition of Legal Reserve area of rural properties in the State of Pará and takes other measures, establishes in Art. 1°: *The "RL, in Pará State, could be 50% compared to the total area of the rural property for those who attended the suppression forestry until 2006".* In the Art. 5° allows: *"The permanent preservation areas may enter in the computation of the legal reserve".*

As for the ABC Plan it arrives at the rural producer through the banking credit directed to the following practices that modernize the agriculture: i) recovery of degraded pastures through the iLPF; ii) direct planting into the straw; iii) biological nitrogen fixation; iv) planted forests; v) treatment of animal waste.

The ABC Plan has a goal of improving and reintegrates cattle 15 million hectares of degraded pastures until 2020. According to the Monitoring Platform ABC, created by the federal government in March 2016, by may of the Embrapa Environment, to follow the progress of the measures to reduce GHG emissions in the period between 2010 and 2015, approximately 10 million hectares have been improved at some level.

The development of agriculture in the sense of its modernization in partnership with environmental preservation has to do with the following factors: i) the closure of the agricultural frontier (ii) the population increase; (iii) the environmental movement; iv) the quality of the product available to the market. What if you can call new farming is an irreversible process, but its continuity and improvement has much to do with the positioning of the policies that the municipalities may take in relation to this segment, since it is of activity whose distinct links in the production chain, or the whole chain are established in municipalities.

About the important role of the municipality in this process, see the article on Development in Focus, December 2016, "The Municipality and the Development in Brazil".

NOTES

1 TATTERSALL, I.; SCHWARTZ, J. H. Evolution of the genus Homo. *Annual Review of Earth Planetary Science,* Palo Alto, v. 37, p.67-92, 2009.

2 Network to Promote Crop-Livestock-Forest Integration. This network was created in 2012 with the objective of accelerating the adoption of the crop-livestock-forest integration system It is formed by big companies producing inputs to livestock, of the cooperative of Cocamar in Maringá, in Paraná State and technical support of the Embrapa. Between January 2014 to August 2016 were performed 204 days in the field, in all Brazilian regions on this system of integration. Two challenges are present for the adoption of the crop-livestock-forest integration system by producers. One is the lack of information and technical assistance to producers, the other is the adequacy of the credit compatible with the reality of the producer.