

# REFLECTIONS OF COMMODITIZATION IN THE BRAZILIAN REGULATION OF PESTICIDES<sup>1</sup>

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## ABSTRACT

This article starts from the historical rescue of the process of commoditization of Brazilian agriculture, a strategy transplanted to Brazil since the 1960s under various justifications, including ending hunger in the world and modernizing agriculture, to demonstrate how the reflexes of this process interfere in the form of regulation on pesticides in the country. Therefore, this work aims to identify how the commoditization strategy, which was designed for Latin America and which placed Brazil as the world's breadbasket, encourages the use of pesticides and results in socio-environmental problems, with the consequent flexibilization of Brazilian legislation. on products that pose risks to health and the environment.

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The research is qualitative, with a social constructivist approach, using the method of bibliographic and documental research. This modernization resulted, among other factors, in the intensive use of pesticides and in the consequent flexibilization of legislation on the subject, which tends to adopt even more malleable measures, causing socio-environmental problems and generating risks to health and the environment.

**Keywords:** agriculture; pesticides; commodities; regulation.

### ***REFLEXOS DA COMMODITIZAÇÃO NA REGULAMENTAÇÃO BRASILEIRA DE AGROTÓXICOS***

*A pesquisa proposta parte do resgate histórico do processo de commoditização da agricultura brasileira, estratégia transplantada para o Brasil desde a década de 1960, sob diversas justificativas, entre as quais a de acabar com a fome no mundo e de modernizar a agricultura, para demonstrar como os reflexos desse processo interferem na forma de regulamentação sobre agrotóxicos no país. Por isso, este trabalho tem como objetivo identificar como a estratégia de commoditização, que foi pensada para a América Latina e que colocou o Brasil como celeiro do mundo, incentiva a utilização de agrotóxicos e resulta em problemas socioambientais, com a consequente flexibilização da legislação brasileira sobre produtos que comportam riscos à saúde e ao meio ambiente. A pesquisa é qualitativa, de abordagem construtivista social, pelo método da pesquisa bibliográfica e documental. Essa modernização resultou, entre outros fatores, no uso intensivo de agrotóxicos e na consequente flexibilização da legislação sobre o assunto, que tende a adotar medidas ainda mais maleáveis, ocasionando problemas socioambientais e gerando riscos à saúde e ao meio ambiente.*

**Palavras-chave:** agricultura; agrotóxicos; commodities; regulação.

## INTRODUCTION

Discussions on the topic of pesticides is not a recent issue, much less endowed with certainties and consents. Talking about this topic raises arguments and questions from both “sides of the coin”, that is, those who defend or not the use of chemicals substances in agricultural production.

The debate around the environmental issue is included on several agendas, due to the commitment of natural resources and their unsustainable use. This scenario includes pesticides, which are widely used for large-scale cultivation, especially in production systems based on monoculture.

With the advancement of genetic manipulation techniques and technological advances in agriculture, it is now possible to use herbicides that do not affect a certain genetically modified cultivar, despite killing all the vegetation that permeates the crops. These and other factors have contributed to a considerable increase in the use of these harmful substances.

Under various production and crop protection justifications, the use of pesticides has been intensified, especially in Brazil. However, the numerous invisible, cross-border and transgenerational risks are disregarded, as well as the dangers imposed on the quality of the environment and human health by the use of agrochemicals.

Therefore, this research proposes to identify how the agricultural commoditization strategy, designed for Latin America, which placed Brazil as the world’s breadbasket, encourages the use of pesticides and causes socio-environmental problems, with the consequent flexibilization of Brazilian legislation on products that pose risks to health and the environment.

For this analysis, it is necessary, at first, to relate the interests of the agrobiological industry to the model of agriculture based on the values of the Green Revolution as a result of an American strategy that, after World War II, imposed on Latin America the condition of supplier of mineral resources and agricultural commodities.

Then, the factors that turned Brazil into the world’s breadbasket and how the socio-environmental impacts compromise human health and the environment are presented. This economic, social and environmental conjuncture has a direct impact on the form of regulation of products that pose risks to health and the environment, as evidenced by the current legislation, Law No. 7.802/89, and corroborated by Bill No. 6,299 (BRASIL, 2002b), better known as *PL do Veneno* (Poison Bill) or *Pacote do Veneno* (Poison Package), which is being processed in the Chamber of Deputies.

The construction process of this article was anchored in the social constructivist conception, according to John W. Creswell (2010), using bibliographic and documentary sources that were selected, categorized and interpreted in the light of research questions and its theoretical framework, characterizing it as an eminently qualitative research.

For this process, initially, works and scientific articles with thematic adherence and scientific relevance were selected, in which we searched for those who were able to describe how the construction of agriculture in Latin America and its intertwining took place.

Then, it was observed how this commoditization process, designed for this region, was able to transform Brazil into the world's breadbasket and, consequently, make its legislation more flexible on products that carry risks to health and the environment.

This selection took place in interdisciplinary areas of knowledge.

The work also included the research of bills that are being processed in the National Congress, more specifically Bill No. 6,299 (BRASIL, 2002b) and its appendices; journalistic websites and materials; dossiers; and other official and unofficial websites, all relevant to the topic.

These materials were available in digital versions on the internet, on specialized platforms and in scientific journals.

## **1 THE RELATIONSHIPS BETWEEN THE AGROBIOCHEMICAL INDUSTRY AND THE PRODUCTION OF AGRICULTURAL COMMODITIES IN BRAZIL**

The socio-economic crisis that hit Latin American countries at the turn of the 21st century led to continued growth in raw material prices on the international market. This happened as a result of the change in this market, due to the strong international demand for natural resources in Latin America, which significantly increased exports and foreign investment in the region. This new scenario triggered a greater dependence on the foreign market for Latin America, given the commodity consensus and the "new extractivisms" (ACOSTA; BRAND, 2018).

The "commoditization" of food has had a substantial impact on the way in which agriculture is organized in Latin American countries that have a large amount of raw materials and which, as a result of commoditization, began to use this market as a tool for "economic growth".

The Commodities Consensus intensified the dependence of the Latin

American countries' economies on the export of primary goods and expanded the number of projects for the "control, accumulation and export of natural goods". In this context, there are unequal exchange processes between countries with a growing effect of reprimarization of Latin American economies, which further asserts the relationship of dependence between developed and underdeveloped countries (SVAMPA, 2012).

Economic growth in Latin America has been mediated by "exports and investments", as pointed out by Gudynas (2012). In this scenario, in the first decade of the 21st century, new movements of progressive states, known as the new left, have intensified the production of export commodities with the appropriation of nature, under the justification of economic growth and social justice, thus characterizing a vicious cycle, in which new extractivisms are necessary for the "plans against poverty", appearing to be a "benevolent capitalism".

It means to say that the new left presented itself under a new "guise" within the very capitalism that it criticized so much. In this configuration emerges the "Compensating State", based on increasing exports of natural resources and expanding extraction of such resources as ores, oil and products from monoculture systems (GUDYNAS, 2012, p. 130-131).

In the agricultural sector, the commoditization process generates a loss of food sovereignty, since the export of food on a large scale is destined, mainly, for animal consumption and biofuels production. Furthermore, the new consensus on goods leads to the deepening of a dynamic of expropriation of lands, resources and territories, which generates "new forms of dependence and domination" (SVAMPA, 2012, p. 17).

Gudynas (2012) classifies two types of extractivism. The first can be classified as "classic", considered the most common in recent decades and typical of conservative governments. The second originates with progressive governments and is configured as "neo-extractivism" or "progressive neo-extractivism". In this new type, there were some substantial changes, such as the so-called nationalizations of resources. However, the substantial basis of exploitation remains the same: exporting commodities and fixing negative externalities. In the new extractive model, production expands to other sectors, mainly in export monocultures and in the deepening of mining and oil extraction.

Svampa (2012, p. 17, our translation) adds that:

[...] extractivism does not only include activities typically considered as such (mining and hydrocarbons), but also agribusiness and the production of biofuels, which are

inscribed in an extractive logic through the consolidation of a model that tends to be a monoproducer, which disrupts and reorients territories, destroys biodiversity and deepens land grabbing.

Thus, according to Acosta and Brand (2018, p. 51), there is no such thing as good extractivism and bad extractivism, because “[...] extractivism is what it is: a set of activities of massive extraction of primary resources for export, which, within capitalism, becomes fundamental in the context of the primary-export accumulation mode”. Therefore, it can be said that extractivism is as “predatory” as capitalism and that it tends to destroy human beings and nature.

To better understand the arguments used, an analysis will initially be carried out on the commoditization strategies of agriculture in Latin America, which made Brazil the “great breadbasket of the world”, and the relations between this model of agriculture and the agrobiochemical industry, as well as its reflexes encourage the flexibilization of the Brazilian legislation on pesticides.

## **2 THE COMMODITIZATION OF AGRICULTURE AS A RESULT OF A POLITICAL AND ECONOMIC STRATEGY DESIGNED FOR LATIN AMERICA**

The post-war period brought with it new boundaries for the world economy. Several strategies were used by countries in search of a new organization that would achieve the capitalist objectives of the time, so that this economic model could survive. There were several experiences, marked by periods of great social, economic and technological changes, which caused the aggravation of social and environmental problems.

The Cold War also profoundly marked the economy and politics in the mid-twentieth century, as it involved two opposing blocs, led, on the one hand, by the United States and, on the other, by the Union of Soviet Socialist Republics – USSR (GASPAR, 2015).

In a scenario of polarization between different proposals for economic development, on the capitalist “side” of the world, the United States of America assumed the leading role in strategic sectors in world geopolitics. To this end, several strategies were used to consolidate its hegemony, based on a foreign policy that promoted its internal prosperity, while increasing its margin of power on the world stage, such as multilateralism with the Bretton Woods Agreements and, later, with a unilateral approach, the Marshall Plan (SIMON, 2010).

The Marshall Plan had two purposes: to secure the European consumer market and to contain the communist advance. The United States aimed, above all, to consolidate capitalism in Western Europe, because, in addition to the money supply, there was the concession of machinery, raw materials and technology. The Marshall Plan was not presented as an instrument, per se, against the Soviet Union, but as a plan of goodwill by the United States to help states that were going through a severe crisis (SIMON, 2010).

The fact is that the Marshall Plan did not only serve as a strategy for the recovery of Europe and the containment of communism, but, above all, as a means of breaking the old European economic model, which placed the United States as a hegemonic country. This configuration was supported by an ideology of market freedom and defense of the values of the “*American way of life*”, which contributed to the implementation of a capitalist model centered on mass production and consumption (WERNER; COMBAT, 2007, p. 187). In one way or another, the Cold War dominated international politics until the late 1980s, as it was based on different power strategies and worldviews, which were materialized in the adhesion of one of the sides of dispute between the USA and the USSR (GASPAR, 2015).

The Third World, made up of States that integrated vast colonial empires and peoples who were subjugated to centuries of colonial exploitation and considered backward, sought with decolonization and the post-war period a new autonomous course of economic and social development. Nationalism was incorporated into the speeches and the new economic goals were translated into ambitious development plans, the object of fierce disputes between the United States and the USSR. These plans were meant to recover the historical backwardness and raise the standard of living of their peoples to guarantee autonomy through industrialization, the strengthening of the internal market and agricultural promotion (GASPAR, 2015).

Harry S. Truman, elected president of the United States in 1948, in his inaugural speech, highlighted a kind of “consolation prize” for countries that were not covered by the Marshall Plan, the undeveloped or underdeveloped ones, designated as Point Four. This plan was developed by the US government to assist “background areas” in technological knowledge. The speech made by Truman, a little more than a year after the Marshall Plan was announced, is an important political reference of the United States for Latin America, which also encompassed all other underdeveloped countries. If for the developed countries, mainly for Europe, all the opportunities and concrete conditions for the restoration

were offered, for the underdeveloped world “technology would be the salvationist chimera” (TOTA, 2017, p. 70).

Before the plan, the North Americans had already entered Brazilian territory to implement their techniques. In mid-1946, the American Nelson Aldrich Rockefeller landed on Brazilian soil with many projects, under the justification of helping the country, which would have been a great ally in the post-war period, mainly through the modernization of its techniques. At the time, Nelson Rockefeller founded the American International Association (AIA), with philanthropic purposes (TOTA, 2017).

The EIA became known mainly for systematically introducing agricultural extension programs according to the North American model in Brazil and other Latin American countries (SILVA, 2013).

In agriculture and livestock, techniques capable of developing the hybrid corn crop, new research to improve the quality of coffee, experiments with pastures for cattle, new breeds of pigs, extensive production of chickens, as well the manufacture of fertilizers and animal feed, were created. In addition, conditions were offered to prepare large tracts of land for planting, spraying, by means of helicopters, plantations to combat pests, all of this to facilitate the farmers’ task. However, the introduction of these practices did not occur significantly at that time (TOTA, 2017).

This modernization process resulted in a deepening of political, economic and cultural relations between Brazil and the United States, especially during the military dictatorship (SILVA, 2013).

The process of modernizing agriculture became known as the “Green Revolution” and was thought of long before the end of the World War II, by private institutions such as Rockefeller and Ford, who saw in agriculture a chance to reproduce capital. From there began a process of investment in techniques for the improvement of seeds, such as wheat, corn and rice, the staple food of the world population. The Green Revolution, set in motion after the World War II, became known as a model based on the intensive use of pesticides and synthetic fertilizers in agricultural production, in which technological advancement to increase productivity was not the only strategy of the capitalist system, but it also involved a social, political and economic intention (ANDRADES; GANIMI, 2007).

Many of the chemical industries, which supplied the military might of the United States, began to “[...] produce and encourage the use of pesticides: herbicides, fungicides, insecticides and chemical fertilizers in agricultural production to eliminate fungi, insects and weeds [...]”, as a means of draining production surpluses and maintaining permanent profit,

regardless of the existence of wars. However, the cycle of technological innovations of the Green Revolution would only be complete with the construction and adoption of heavy machinery, such as tractors and harvesters, which would be used from planting to the final harvest of agricultural production (ANDRADES; GANIMI, 2007, p. 45-46).

The Green Revolution was presented as a strategy to transcend scarcity and generate abundance. However, it created new requirements for production, as this model requires high investments in fertilizers, pesticides, seeds, water and energy, has led to ecological destruction and has given rise to new types of scarcity and vulnerabilities. The Green Revolution, which was presented as the post-war salvation, introduced new limits to agriculture by wasting and compromising soil and water resources, in addition to destroying crop diversity (SHIVA, 2015).

It can be seen that the capitalist appropriation carried out in Brazil and Latin America is very well represented by what Gudynas (2012, p. 142) points out, when he states that

[...] there is in South America an ancient cultural heritage based on the exploration of nature, which understands the territory as full of riches. There is anchored the myth of a 'magic State' that should only extract these riches to sustain economic growth.

### **3 BRAZIL, THE BREADBASKET OF THE WORLD**

The modernization of agriculture imposed by the Green Revolution is based on the expansion of the production model through monocultures with hybrid plants, the use of non-renewable energies such as pesticides and fertilizers as subsidies for the production, and the intensification of the genetic alteration of food (OCTAVIANO, 2010).

In Brazil, the opening of new agricultural frontiers was carried out by large companies, with State support, which provided the process of agricultural modernization with the union between industry and agriculture. This combination brought about profound changes in the national agrarian structure. One of the most significant is related to the choice of product to be cultivated, which must meet the agricultural model based on the monoculture of cultivars for export, such as soybean, corn, cotton, rice and sugarcane. In this context, technological packages and credit expansion were implemented for the import of inputs and machinery (ANDRADES; GANIMI, 2007).

There were several implementation strategies for this new agricultural system, which resulted in political and legal instruments that aimed primarily at the expansion of rural credit and the introduction of new agricultural methods. An example of this was the creation of the National Rural Credit System in 1965, through Law No. 4,829, and which was later regulated by Decree No. 58,380/66. In 1975, another mechanism was implemented: the National Agricultural Defensive Program, which allowed the creation of companies and the installation of subsidiaries of transnational agricultural inputs in the country. The expansion of this agricultural credit line in the country significantly helped in the process of agriculture modernization and in the increase in pesticide use (WIENKE, 2018).

Official rural credit, the main modernization subsidy, was highly selective and benefited only medium and large rural producers, since small tenants, sharecroppers and partners did not have the guarantees required by the financial sector. In the 1980s, this financing pattern was exhausted, given the financial crisis, so that, until 1990, the State turned to crisis management, without establishing public policies. In 1994, the Plano Real was created, which stabilized the country's economy and resulted in the opening of the economy to the international market. In 1996, during the government of then President Fernando Henrique Cardoso (FHC), the National Program for the Strengthening of Family Agriculture (PRONAF) was launched, aimed at providing differentiated access to credit for rural producers with areas smaller than or equal to four fiscal modules and with the hiring of up to two workers (HESPANHOL, 2008).

Family farming and peasant knowledge were denied at the time of the Green Revolution, even presenting characteristics of the breakup of monoculture and the expansion of jobs in the countryside. This model of family farming and small rural family production was understood only as subsistence, incapable of progressing economically and socially. The fact is that the agricultural credit subsidized by this revolution was directed to the elite of the rural world and these family farming policies did not make the economic growth of this sector viable in a significant way, since they took the form of social assistance, called by many as programs of subsistence, which did not guarantee the progress and social rise of small farmers (MOREIRA, 2000).

From the 1990s onwards, another power concentration process took place in Brazil, this time in the export sector, which became stronger under the control of a small number of large agribusinesses in the world market.

These companies' development strategies began to significantly interfere in Brazilian agriculture, in view of the investment capacity and the power to determine the market prices of agricultural products. The fact that these companies have units or subsidiaries in several countries gave them greater power and insertion in the world food market, directly influencing agricultural policies not only in Brazil, but in many other countries, as in the case of the introduction of transgenic soy by Monsanto (NUNES, 2007).

The increase in the concentration and control of the sector by a small number of agro-industries was accompanied by the increase in the control of the retail sector by large global supermarket chains. The importance of these large retail chains has a direct impact on the share of the global volume of food that is sold directly to consumers, which increases profits for the entire chain, as in the case of farmers and industry, and forces other sectors to adjust to their demands, "in terms of both the type and the processes used in production and industrialization". This context clearly demonstrates the ability of large agribusinesses and large retail chains to control the market (NUNES, 2007, p. 9).

Currently,

[...] Brazil is the main world exporter of sugar, the second largest producer of alcohol (ethanol produced from sugarcane) and is also, in recent years, the first or second largest soy exporter and the second largest corn exporter (BOMBARDI, 2017, p. 23-25).

However, at the same time that it has high export rates, it also has the same ethanol and corn import rates, which means that Brazil's production logic is related to an internationalized economy mechanism, revealing the idea that the country has food and energy sovereignty. This increase in the importance of exporting Brazilian agricultural products represents the absolute expansion in the production of commodities in Brazil (BOMBARDI, 2017). In addition, the production of commodities in Brazil has significantly reduced the production of crops intended to feed the population (BOMBARDI, 2017).

Moreover, there are currently new projects to implement the production of biofuels in the country, with national and foreign investments, since there is the possibility of the depletion of oil as an energy matrix. The production of these biofuels is being considered a new production alternative for Brazil, quickly mobilizing the economic interests of large companies. In this regard, sugarcane production under the monoculture system tends to increase significantly, further aggravating socio-environmental problems,

to the detriment of the so-called “clean energies” (NUNES, 2007, p. 13).

The Green Revolution presented numerous contradictions, given that the promise of job creation did not materialize, machines invaded the countryside and the diversified production of family agriculture gave way to monocultures. The production of food for the domestic market was negligible, as the large plantations were destined for export. The solidification of large estates triggered joblessness in the countryside and thereby rural exodus and the emergence of city peripheries. In addition, food was no longer safe and the land began to undergo processes of desertification due to unsustainable farming methods, a fact that worsened because, in addition to the introduction of the chemical industry, seeds that received high doses of fertilizers and pesticides to control “pests” began to be developed and introduced (LAZZARI; SOUZA, 2017, p. 5).

From the decline of the pesticide industry and the concern with the environmental problems resulting from the activity, from the 1980s onwards, large industries began to seek new strategies for the consumer market. The possibility of commercial exploitation of biotechnology, based on genetic engineering, through the development of genetically modified organisms (GMOs), emerged as an alternative for a more sustainable agriculture, as there was the possibility of developing seeds that did not use pesticides (ALBERGONI; PELAEZ, 2007).

This new technology, however, worried the chemical industry, especially in the pesticide segment. As a strategy, these companies began to look for alternatives to remain in the market and return profitability to large technology-producing companies, through seed diversification, the creation of complementary products to pesticides, such as herbicide-tolerant seeds, that is, production of transgenic seeds and cultivars (ALBERGONI; PELAEZ, 2007).

The production of transgenics represents an important aspect for world agriculture, since most of the areas are cultivated with species of agronomic interests. The area of transgenic crops has increased significantly since the first cultivar, in 1996. This statement is also corroborated by the report of the International Service for the Acquisition of Agri-biotech Applications – ISAAA, which in 2011 reported that Brazil planted around “[...] 21.4 million hectares with genetically modified crops, making it the second largest producer of transgenics in the world” (MATOS, 2011, p. 6).

Currently, in Brazil, 96.5% of soy production is transgenic, which corresponds to “an area of 32.7 million transgenic hectares”; the production

of transgenic corn represents 88.7% and corresponds to an area of 15.7 million transgenic hectares; and cotton, which also has transgenic production, represents 78.4%, which corresponds to an area of 789 thousand hectares of this type of cultivation. A significant part of these crops concerns seed modalities that are tolerant to the herbicide glyphosate, considered the most commercialized pesticide in Brazil (BOMBARDI, 2017, p. 35).

This increase in the production of transgenics in Brazil and in the world, however, is variously questioned. While some sectors focused on agribusiness – ISAAA (2018), CIB, among others – argue that the production of transgenic seeds is sustainable and guarantees world food security, in addition to presenting characteristics capable of mitigating problems related to climate change and the new “pests” of agriculture, other sectors vehemently criticize this stance adopted by world agriculture and especially Brazilian agriculture, as is the case of the document filed with the Ministry of Science and Technology, in 2011, by several entities, entitled *Transgenics in Brazil: the accelerated scenario of releases of GMOs in Brazil, control in the agri-food chain and the systematic violation of the precautionary principle* (TERRA DE DIREITOS, 2011), which aimed to criticize transgenics and the use of pesticides and defend other models of alternative and sustainable agriculture.

The aforementioned document maintains that in 2008 Brazil became the largest consumer of pesticides in the world, using 733.9 thousand tons and reaching one million tons in 2010, in addition to being considered, in 2009, the country with the second largest area cultivated with transgenics. About 74% of this seed production chain is owned by transnational companies such as “Syngenta, Bayer, Monsanto, Basf, Du Pont and Dow AgroSciences”, through agrobiotechnological patents, which are among the largest seed companies in the world and are responsible for manipulating the seed market, reducing the possibilities of using conventional seeds and reproducing plants that are highly resistant to the use of pesticides, which requires higher doses of chemicals or products of greater toxicity (TERRA DE DIREITOS, 2011, p. 2-4).

Although the data that indicate an increase in the planted area may represent a positive advertisement regarding the adoption of transgenic technology, the fact is that farmers do not have the right to choose the type of production system they want to lead, either by controlling the seed trade, either by the genetic contamination of conventional or organic cultivated fields by transgenic varieties (TERRA DE DIREITOS, 2011).

The adoption of genetically modified seeds was based on the promise of agronomic and economic benefits, especially with regard to reducing pesticides use. However, this statement is quite controversial, as antagonistic studies on the subject have been published. Regardless of the divergent research results, the fact that large pesticide producers invest massively in the production of herbicide-resistant genetically modified organisms demonstrates the strategy of (re)valuing their producing merchants (ALBERGONI; PELAEZ, 2007).

It means to say, in this sense, that the monopoly and policies of the large companies that produce seeds and pesticides, make the producers have a very reduced margin of choice, linking them to the use of transgenics and consequently of pesticides, resulting in a chain of chemical dependency. In this regard, the growing use of pesticides has been a matter of increasing concern, due to the socio-environmental problems that their use has caused and the increasingly imminent legislative flexibility.

#### **4 SOCIO-ENVIRONMENTAL IMPACTS OF COMMODITIES PRODUCTION AND THE ATTEMPT TO MAKE THE BRAZILIAN AGRICULTURAL LEGISLATION MORE FLEXIBLE**

The environmental, economic and social impacts caused by the modernization of agriculture are based “[...] on the intensive use of technological packages, on the mechanization of work, on the union between agriculture and industry, on the selection of species, on monoculture, on large estates and on boundless consumerism, especially in developed countries” (ANDRADES; GANIMI, 2007, p. 50).

Modern agriculture, inserted in a productivist model of its own, did not provide the overcoming of poverty in rural areas, much less the improvement of the lives of the populations and overcoming hunger in the world, on the contrary, despite the increase in food supply, the problems related to distribution persisted and even worsened. Despite evidence of the social and environmental problems caused by this mode of agriculture, the hegemonic model of production remains in force, in view of political and economic interests. The productive segments that supply large markets are dominated by corporations located mainly in the United States and the European Union (HESPANHOL, 2008).

According to Gudynas (2012, p. 133), the exploitation of resources, based on extractivism and the export of commodities,

[...] has strong territorial effects. In a way, the territorial fragmentation that implies the existence of exploitation sites directly linked to globalization is maintained or accentuated, while large areas remain unsupervised by the State. In other ways, a new geography is imposed on the basis of oil concession blocks or mining licenses that displace local communities, nullify other productive circuits or break ancestral boundaries. There are also strong environmental and social impacts. Problems due to pollution, loss of biodiversity and other environmental effects persist and, in some cases, worsen.

Brazilian agriculture, in a perspective of globalization, has consolidated its agriculture through the expansion of crops destined for the production of commodities and agrofuels that demand the intensive use of pesticides, significantly reducing food production and aggravating the problems related to land concentration and intensifying degrading work (BOMBARDI, 2017).

Bombardi (2017) states that Brazil consumes about 20% of the pesticide sold worldwide. The consumption of pesticides in Brazil increased from 170 thousand tons in 2000 to 500 thousand tons in 2014, which represents an increase of 135% in a period of 15 years.

According to a Public Note from the José Alencar Gomes da Silva National Cancer Institute (INCA), pesticide consumption in Brazil grew by 190% in the last ten years. In national and international scientific literature, the current model of agriculture, with intensive use of pesticides, characterizes food insecurity, in addition to other harms such as environmental pollution (ABRASCO; ABA, 2018).

The ABRASCO Dossier: a warning about the impacts of pesticides on health (CARNEIRO *et al.*, 2015) presents four agricultural commodities, of great interest to agribusiness, that use pesticides the most, namely: soybean, sugarcane, corn and cotton. In 2012 and 2013, these crops were responsible for about 75% and 80%, respectively, of the use of poisons in Brazil, with soybean being responsible for approximately half of this use.

In Shiva's view (2003, p. 68), "[...] the crucial characteristic of monocultures is that, in addition to replacing alternatives, they even destroy their base. They do not tolerate other systems and are not able to reproduce in a sustainable way" Shiva (2003, p. 85) adds that "diversity is characteristic of nature and the basis of ecological stability". In other words, this model of agriculture, which combines monocultures, transgenics and pesticides and which results in the loss of biodiversity, proves to be unsustainable.

As a consequence of this, there is a dramatic loss of the country's

genetic heritage, either through the homogenization of cultivated varieties, or through the replacement of crops intended for food by monocultures intended for export. All this causes the country's food sovereignty and security to be seriously threatened (TERRA DE DIREITOS, 2011).

The dependence of agribusiness production chains on the chemical model causes a process of environmental unsustainability, as it causes occupational, health, environmental and social vulnerabilities. These vulnerabilities are externalized in “[...] degrading and slave labor, work accidents, human intoxication, cancers, malformations, mutilations, sequelae [...]” and, also, the contamination of soil, water and air, by pesticides and chemical fertilizers (CARNEIRO *et al.*, 2015, p. 109).

The Pan American Health Organization (PAHO, 1996) *Health Surveillance Manual for populations exposed to pesticides* defines that the greatest use of pesticides occurs in agriculture, mainly in the monoculture system, in large areas, and among professional groups who maintain contact with these substances, the following stand out: the agricultural sector; public health; fumigation firms; transport and trade; and formulation and synthesis industries.

According to Bombardi (2017, p. 54), according to data from the Ministry of Health, if all the cases of pesticide poisoning in Brazil are added up, they account for more than 25 thousand, from 2007 to 2014, which means an average of 3,125 thousand a year, or eight poisonings a day. However, for each notification made, it is estimated that there are another 50 unreported cases, that is, “this means an underreporting of the order of 1 to 50”. It is therefore calculated that it is possible that “[...] there were about 1,250,000 (one million, two hundred and fifty thousand) poisonings by pesticides for agricultural use in this period”.

Bombardi (2017) states that about 30% of the active ingredients of pesticides used in Brazil are expressly prohibited in the European Union. The strategy of large agrochemical companies is, therefore, linked to the different legislative perspectives of each country. In other words, companies that manufacture pesticides seek the environmental facilities present in peripheral countries, since the legislation of these countries allows, as is the case in Brazil, and given that the legislation of the countries of origin of these companies has been increasingly more restrictive, as is the case with the European Union.

This scenario of commoditization of agriculture, intensification of pesticide use and utilization of transgenic cultivars resulted in a panorama

of flexibility for the use of these techniques in Brazilian agriculture, an example of which is the processing of Bill No. 6,299 (BRASIL, 2002b) in the National Congress.

It is from art. 225 of the Federal Constitution of 1988 that products that pose risks to health and the environment are regulated in Brazil. Based on this constitutional command, Law No. 7.802/89, regulated by Decree no. 4,074 (BRASIL, 2002a) was instituted.

Work on pesticides in Brazil is carried out based on this regulation, since the legislation provides for research, experimentation, production, packaging and labeling, transport, storage, commercialization, commercial advertising, use, import, export, final destination of waste and packaging, registration, classification, control, inspection and supervision of pesticides, their components and the like, and other provisions.

Although this research was not primarily designed to detail the current legislation, it is an important milestone to demonstrate how the form of agriculture implemented in Brazil promotes the flexibilization of its legislation, in order to allow more accentuated uses of pesticides.

There are several criticisms related to the absence of several adequate legislative criteria, among which the validity of the registry stands out, which, from the adoption of Decree No. 4,074 (BRASIL, 2002a), became indeterminate, and can be canceled only in cases of toxicological reassessment, in the impossibility of remedying irregularities or even when fraud is identified.

The current regulation on the subject also does not present the so-called closed zones or prohibition zones, nor does it establish minimum spraying distances, which demonstrates the aggravation of health, social and environmental issues, especially in places close to these areas.

These gaps left by the law tend to allow agroeconomic interests to appropriate these vulnerabilities to make available and implement new pesticides and even expand agricultural production based on the chemical package.

However, despite this legislative uproar, the intention is to make the Brazilian regulation of pesticides even more flexible, including the proposal to change the identifier term to “phytosanitary and environmental control product”.

Several are the justifications for this “new” Bill No. 6,299 (BRASIL, 2002b), also known as “Poison Bill” or “Poison Package”, among which we can highlight the increase in productivity, the decrease in product

prices, the complexity and delay in the approval process, since evaluation is required by three federal government agencies: the Ministry of Agriculture, Livestock and Supply (MAPA), the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA), and the National Health Surveillance Agency (ANVISA).

This bill started in 1999, in the Federal Senate, and since then it has received a series of additions to projects with similar issues. However, the most profound changes were caused by the addition of Bill No. 3,200/15, which was proposed with the aim of repealing the current legislation on pesticides to implement extremely flexible provisions, as well as to change the term “pesticides and related” to “phytosanitary and environmental control product” – Bill No. 6,299 (BRASIL, 2002b).

The aforementioned project has already received approval opinions from a special commission and is still in the process of being voted on by the Plenary – Bill No. 6,299 (BRASIL, 2002b).

From this analysis, it appears that the flexibility in the use of pesticides is associated with the agriculture model presented at the beginning of this work. Commoditization and production in monocultures favor this flexibility in legislation, as large companies seek to install themselves in countries where legislation is more flexible and facilitate market dominance.

One of the main justifications that permeated the entire trajectory of flexibilization of pesticide regulation in Brazil is based on the need for the country to become a major player in the world food scene. The idea is to lower the cost of agro-industrial products and, with this, compete in the international market under better conditions. In fact, what is sought is to guarantee a profitable market for products that are no longer used in other countries, due to legal restrictions, and to prolong the profitability of large chemical conglomerates.

This model of agriculture, transplanted to Brazil, based on the introduction of new techniques and the justification of food production for the world, instilled the notion that, as the breadbasket of the world, the country must bear the burden of commoditizing agriculture.

However, it is clear that many countries and economic blocs are looking for production models with the reduction or restriction of pesticides, which would remove from Brazil the possibility of acting at the forefront of food production in a sustainable way.

## CONCLUSION

The modernization of Latin American agriculture was a North American project designed for this region, characterized as a place full of goods that can be exploited and with marked profitability, especially with regard to agriculture and biofuels.

The commoditization of Brazilian agriculture has placed the country as the great breadbasket of the world. Contrary to what is claimed by holders of agrobiotechnological interests, the production of agricultural commodities is not aimed at overcoming hunger in the world or at solving socio-environmental problems, but to satisfy socio-economic interests.

The result of this commoditization is the aggravation of health, social and environmental issues, since it causes a series of vulnerabilities, especially for the populations of the places most affected by this accentuated use of pesticides.

The consequences of this modernization process are also reflected in Brazilian legislation on products that pose a risk to human health and the environment, since it indicates a series of flexibilities, as is the case of Bill No. 6,299 (BRASIL, 2002b), which tends to repeal the current legislation and even modify the identifier term.

It is necessary to point out that, although the current legislation on pesticides and the like is flawed, it must be considered that it needs to guarantee security about risks and dangers, in order to guarantee the protective system evidenced by the Federal Constitution of 1988, and not to make the use and commercialization of these substances even more flexible, as is the case of the aforementioned project.

The implementation of this flexibility tends to further aggravate socio-environmental vulnerabilities, removing from the country the possibility of producing in a more sustainable way.

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