http://dx.doi.org/10.18623/rvd.v17i38.1755

A REVIEW OF BRAZILIAN BILL N. 6,299/2002 ON PESTICIDE REGULATION AND ITS IMPACTS ON FOOD SECURITY AND NUTRITION

Kamila Pope[1]
Leibniz-Centre for Agricultural Landscape Research (ZALF)

Marina Demaria Venâncio[2]
Universidade Federal de Santa Catarina (UFSC)

Michelle Bonatti[3]
Leibniz-Centre for Agricultural Landscape Research (ZALF)

Stefan Sieber[4]
Leibniz-Centre for Agricultural Landscape Research (ZALF)

ABSTRACT

Brazilian legislative proposal n. 6,299/2002, addressing pesticide regulation, represents an attempt to loosen and weaken the regulation of these substances, threatening the rights to food and a healthy environment as enshrined in the Constitution of the Federative Republic of Brazil. This article reviews the bill and its more troublesome provisions through the

1 Ph.D. in Law from UFSC (International Law and Sustainability). Master's degree in Law, State and Society from UFSC. Bachelor of Laws from UFSC. Visiting Researcher at ZALF. Researcher at the Environmental Law and Political Ecology in the Risk Society Research Group (GPDA / UFSC). Member of the Expert Committee of Halte à l'Obsolescence Programmée (HOP). Member of the World Commission on Environmental Law (WCEL / IUCN). Member of Harmony with Nature Knowledge Network Experts (HwN / UN). Lawyer and member of the Brazilian Bar Association (OAB / SC). ORCID: http://orcid.org/0000-0002-0248-1288 / e-mail: popekamilla@gmail.com

2 Ph.D. candidate in law (Ecological Rights and Human Rights) at UFSC. Master's degree in law and bachelor's degree in law from UFSC. Country Representative of the Young Professionals for Agricultural Development (YPARD). Junior Deputy Chair of the IUCN World Commission on Environmental Law Climate Change Specialist Group. President of the Early Career Researchers Network of Networks. Member of the Environmental Law and Political Ecology in the Risk Society Research Group (GPDA/ UFSC). Member of the Institute O Direito por um Planeta Verde and the Brazilian Association of Agroecology. ORCID: http://orcid. org/0000-0002-7412-5477 / e-mail: marinademariavenancio@gmail.com

3 Ph.D. in Agriculture from the Humboldt-Universität zu Berlin. Master's degree in Rural Development from the Universidad de Buenos Aires (UBA). Bachelor degree in Agronomy from UFSC. Deputy head of ZALF's department "Sustainable Land Use in Developing Countries." Professor of Environmental Sociology and Environmental Policy of the master's program in Integrated Natural Resource Management at Humboldt-Universität zu Berlin. ORCID: http://orcid. org/0000-0001-8511-5365 / e-mail: Michelle.bonatti@zalf.de

4 Ph.D. in Agricultural Economics from Universität Bonn. Associate professor of Environmental Sociology and Environmental Policy for the master's program at Humboldt-Universität zu Berlin. Head of ZALF's department "Sustainable Land Use in Developing Countries." ORCID: http://orcid. org/0000-0002-4849-7277 / e-mail: sieber@zalf.de

lenses of food security and nutrition as well as national environmental law principles and provisions. Within this background, the paper concludes that Bill n. 6,299/2002 works against previously achieved progress in providing alternative policy pathways for sustainable agriculture in Brazil. It clashes with environmental law principles, neglecting precaution and prevention, representing a regression in terms of protection levels, while undermining human rights to food and a healthy environment. The methodology includes a literature and documentary review, along with inductive reasoning.

Keywords: agroecology; food security and nutrition; human right to a healthy environment; human right to food; pesticide regulation.

UMA ANÁLISE JURÍDICA DO PROJETO DE LEI BRASILEIRO N. 6.299/2002 SOBRE A REGULAMENTAÇAO DOS AGROTÓXICOS E SEUS IMPACTOS NA SEGURANÇA ALIMENTAR E NUTRICIONAL

RESUMO

O projeto de lei n. 6.299/2002 acerca de regulação dos agrotóxicos busca fragilizar e enfraquecer a regulamentação destas substâncias no país, ameaçando os direitos à alimentação e ao meio ambiente sadio. Neste contexto, este artigo procura analisar o projeto de lei e suas proposições mais controversas. Para isso, usará como ponto de partida as noções de segurança alimentar a nutricional e os princípios, regras e normas de direito ambiental aplicáveis à questão. Diante deste contexto, o trabalho conclui que o projeto de lei n. 6.299 vem na antemão do desenvolvimento de novas políticas e caminhos alternativos para a agricultura sustentável no país, colidindo com os princípios de direito ambiental, negligenciando a precaução e prevenção, representando uma regressão ambiental em termos de níveis de proteção e, por fim, comprometendo a realização plena do direito humano à alimentação. Adota-se o método indutivo, e as técnicas de pesquisa bibliográfica e documental.

Palavras-chave: *agroecologia; direito humano à alimentação; direito humano ao meio ambiente sadio e equilibrado; regulamentação dos agrotóxicos; segurança alimentar e nutricional.*

INTRODUCTION

With the emergence of the Anthropocene,[5] an era in which humankind is the driving force shaping the Earth's future, socio-environmental problems have also become increasingly interconnected, transboundary, and complex (see CRUTZEN, 2006; BECK, 2008; LECK *et al*., 2015). In particular, pesticides are a relevant example of a truly anthropogenic socio-environmental problem, given their scientifically proven harmful risks and consequences for both human health and the environment (see KIM, KABIR and JAHAN, 2017; HERNÁNDEZ *et al*., 2013; WILSON; TISDELL, 2001). These agrochemicals challenge current legal and political systems, which are faced with providing responses to, and coping with, their side effects, trade-offs, and socio-environmental outcomes.

In this context, Brazil is an interesting subject: despite its rich environmental legislation, the country often adopts contradictory rural policies that represent a regression in terms of environmental standards. More specifically, it is in the international spotlight due to Bill n. 6,299/2002 (known as the "the poison package"). The bills seeks to change significantly the rules for research, experimentation, production, storage, marketing, packaging, transportation, export, and disposal of pesticides. As this article demonstrates, the bill will loosen the country's regulation on pesticides if approved. That raises the question of whether such bills respect the Brazilian Legal Framework, specifically concerning the right to food, as well as the right to a healthy and balanced environment. Thus, this paper reviews Bill n. 6,299/2002 and its provisions related to pesticides for agricultural purposes, adopting as its conceptual framework the notions of food security and nutrition as well as national environmental law principles, namely the prevention, precautionary, and non-regression principles.

Within this scenario, the first section provides background on pesticide usage in Brazil, outlining examples of the side-effects of these chemicals on human health and contextualising the issue. The following section then addresses the interconnection between pesticides, food security and nutrition, and the human right to food. The third section briefly highlights

5 An increased number of scientists has been using the term Anthropocene to define the period in which humanity has become the predominant force interfering in the future of the planet (CRUTZEN, 2006; STEFFEN *et al.*, 2007). According to Steffen and colleagues (2011), the term "suggests: (i) that the Earth is now moving out of its current geological epoch called the Holocene and (ii) that human activity is largely responsible for this exit from the Holocene, that is, that humankind has become a global geological force in its own right".

the Brazilian legislation and environmental law principles relevant for the analysis of the bill. Lastly, the fourth section discusses the amendments proposed during the legislative process, the content of each may have infringed on the human right to food and the right a healthy environment. The criteria to select the amendments analysed by this paper are (i) their application to pesticides used for agriculture purposes, as well as (ii) their potential to transgress the multidimensional notion of food security and environmental law principles, namely prevention, precautionary; and non-regression principles. This methodological approach is grounded by a literature and documentary review, adopting inductive reasoning.

1 BRAZIL: ONE OF THE LARGEST PESTICIDE CONSUMERS IN THE WORLD

Brazil has a recognized potential to develop sustainable agriculture, at all scales, with celebrated policies like the National Policy for Agroecology and Organic Production (PNAPO; acronym based on Portuguese name). The latter won the World Future Council's Silver Future Policy Award in 2018 for its innovative approach to promoting more sustainable agricultural practices and engaging all society, including women, youth, and family farmers (WFC, 2018). Family farming plays a crucial role in providing for food security and nutrition as well as in supporting the sustainable use, management, and conservation of natural resources in Brazil (ALTIERI; FUNES-MONZOTE; PETERSEN, 2019; ROSSET, 2000). In 2011, small-holder farming constituted roughly 84% of Brazilian farms, which accounted for 86.7% of maize, 76.8% of black beans, and 58.1% of cow's milk produced in the country in that year (BRASIL, 2011b).

Despite these positive trends, since 2008 Brazil has remained at the top of the list of the largest pesticide consumers globally (ALBUQUERQUE *et al*., 2016; PEDLOWSKI, 2012). That is largely attributable to an increasingly influential rural caucus and a governance model that heavily promotes large-scale conventional[6] agriculture (ALTIERI; FUNES-MONZOTE; PETERSEN, 2019; ALTIERI; NICHOLLS; MONTALBA, 2017). Although delving into this debate is beyond the scope of this article, suffice it to say that human diets are becoming increasingly simplified (five

6 In this article, we use as synonyms the adjectives "industrial", "modern", "commercial", "conventional", and "intensive" to broadly refer to the agricultural production model that is heavily dependent on agrochemicals and characterized by the intensive use of land and external inputs, the adoption of intensive agricultural practices, and monocultures.

crops provide roughly half of human food-energy needs and five animal species deliver about a third of the average daily protein consumed) (FAO, 2018, p. 7). This complex phenomenon is a result of many factors, including the historic, consistent, upscaling of green revolution techniques. Notwithstanding the relevant productivity increases allowed by them, the 'modern agriculture package'[7] is pushing food systems to exhaustion and destabilization (SHIVA, 2016a; SHIVA, 2016b). Industrial agriculture is highly dependent on agrochemicals and external inputs, often resulting in deforestation, land conflicts, inequalities, and a series of transboundary risks with severe social, health, and environmental side effects. In Brazil, it accounts for roughly 76% of cultivated land, but represents only 16% of rural properties (BRASIL, 2011b).

A clear example of the aforementioned socio-environmental impacts is the issue of pesticide residues in drinking water. Water supply agencies are required by law to test their water for the presence of 27 pesticides, 17 of which are considered highly hazardous by the Brazilian Health Regulatory Agency (Anvisa, Portuguese acronym). A study by the organizations Repórter Brasil, Agência Pública, and Public Eye shows that water samples from 1,396 municipalities tested positive for all 27 pesticides, most located in the State of São Paulo (ARANHA; ROCHA, 2019). It also highlights that roughly 92% of all water samples tested in 2017 contained traces of pesticides (ARANHA; ROCHA, 2019). This provides evidence of the cumulative effects of pesticides along food chains.

Anvisa is also responsible for coordinating, in partnership with authorities and agencies at the State and Municipal levels, the Program for Analysis of Pesticide Residues (PARA, Portuguese acronym), which aims at assessing pesticide residues in food. The 2013-2015 PARA Report outlines that roughly 58% of collected and analysed food samples[8] contained traces of pesticides. Among those, 19% were considered 'non-satisfactory', that is, they exceeded the Maximum Limit for Residues (LMR) or contained traces of non-authorized pesticides (BRASIL, 2016).

In addition to the problem of water and food contamination, pesticide poisoning also poses a direct threat to human health. Based on data from the Brazilian Ministry of Health (MDS, Portuguese acronym), 2014 registered the highest incidence of poisoning due to pesticide exposure,

7 Including the intensive use of soil and irrigation, monocultures, genetic manipulation, and the extensive use of agrochemical.

8 The study analyzes 12,051 food samples of 25 different types of foodstuffs – such as rice, pineapples, and zucchinis – for 232 different pesticides (BRASIL, 2016).

with 6.26 cases for every 100,000 inhabitants (BRASIL, 2018). Between 2007 and 2015, 84,206 cases were reported. Despite this alarming figure, one must keep in mind that they do not reflect the whole picture, as there is still a gap with not all cases reported (BRASIL, 2018); this represents a frequent problem in studies assessing the impact of these chemicals on the environment and human health.

Concerning agrochemicals directly used in food production, between 2002 and 2011, the average application of pesticides per hectare – including herbicides, insecticides, and fungicides – was of 10 litres per hectare for wheat, 12 litres per hectare for soy, and 28 litres per hectare for cotton, just to name a few of the crops (CARNEIRO *et al.*, 2015). The European Union (EU) bans 22 out of the 50 most widely used pesticides in Brazil (CARNEIRO *et al.*, 2015). Glyphosate, for instance, which was included in 2014 on the Pesticide Action Network (PAN) International List of Highly Hazardous Pesticides (PAN, 2018) and classified in 2016 as 'probably carcinogenic to humans' by the World Health Organization (WHO) (2016), is still widely used in Brazilian agriculture.

These are just a few examples of the significant side-effects of these substances, which are often hard to assess and perceive, leading to unaccountability and posing many challenges to *environmental policy and law*. Despite the significant advances in Brazil since the 1980s in terms of supporting sustainable agriculture and small-holder farming, which is clarified in subsequent sections, the country has not significantly shifted the system away from highly toxic agrochemicals and toward other types of farming techniques and technologies. In 2019, under the current Administration, roughly 474 pesticides and active principles – several considered highly toxic by Anvisa – were registered and authorized by the Ministry of Agriculture (MINISTÉRIO DA AGRICULTURA…, 2019; OLIVEIRA; TOOGE, 2019), representing more than one pesticide per day (MINISTÉRIO DA AGRICULTURA…, 2019). This scenario is alarming, demonstrating the importance of increasing data transparency related to all stages of pesticide life cycles, preserving current control measures, and even tightening their regulation when their risks exacerbate "acceptable standards." Given this brief introduction to the context of agrochemicals usage in Brazil, the next two sections examine legal aspects essential to reviewing Bill n. 6,299/2002, namely the food security and nutrition framework (section 2) and Brazilian environmental law norms (section 3).

2 FOOD SECURITY AND NUTRITION: A LEGAL PERSPECTIVE

First enshrined in an international document in the 1974 Declaration of the World Food Conference, the concept of food security and nutrition is constantly evolving. The 1974 declaration stated that "[e]very man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and maintain their physical and mental faculties." A product of 1974, this definition reflects the main international concerns of that time, namely feeding a growing population and addressing hunger (generally understood as undernutrition). Over the years and with increasing attention devoted to health and sustainability challenges, the concept has evolved into a modern understanding that also encompasses the *qualitative* aspects of food production and tackles the "triple burden of malnutrition" (undernutrition, micronutrient deficiencies, and overnutrition).

In this context, food security and nutrition does not only mean "providing enough food", but rather it is about providing *access to nutritional and safe food* to a growing population. The FAO's Voluntary Guidelines reflect this modern concept: "[f]ood security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 2005, p. 5). One may argue that the concept of "nutritious" and "safe" implies having foodstuffs rich in variety and free of contaminants, like toxic agrochemicals. According to this perspective, the data outlined in the previous section exemplifies that the indiscriminate use of chemical fertilizers and pesticides is undermining several aspects of food security and nutrition in Brazil.

Of note, food security and nutrition has at least four dimensions: (i) *food availability*, which is associated with the supply of food and with the capacity of countries to provide it in quality and quantity to meet the demand; (ii) *food access*, which comprehends the social, physical, and economic resources to achieve access; (iii*) stability* in the food supply, securing it despite climate change and market fluctuations, among others; and (iv) *food utilization* through adequate and balanced diets, health care systems, clean water, and sanitation (FAO, 2017). We can also add a cultural dimension, which relates to the cultural appropriateness of food. For instance, these dimensions are violated by modern agricultural practices when they lead to the conversion of small-holder farmland to

export monocultures, preventing farmers from producing enough food to meet their demands (availability), or to the contamination of food by pesticides and other pollutants (utilization) (VENÂNCIO, 2018).

From a legal perspective, it is worth noticing that achieving all dimensions of food security and nutrition is directly linked to safeguarding the human right to food. This human right[9] can be defined as

> […] the right to have regular, permanent and free access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, and which ensures a physical and mental, individual and collective, fulfilling and dignified life free of fear (ZIEGLER, 2001 p. 7).

It poses a series of obligations to the States, which must take steps to achieve its full realization progressively. These responsibilities include the obligation to respect existing access to adequate food (refraining from actions and measures that might limit such access), the obligation protect the human right to food (making efforts to ensure that individuals and companies do not prevent others from accessing adequate food), and the obligation to fulfil this right (facilitate and provide) (ECOSOC, 1999; LAMBECK, 2014). The latter aims at facilitating and strengthening the access to food through proactive state action and at providing the human right to food for those who are unable, for reasons beyond their control, to enjoy it (ECOSOC, 1999).

In this context, the law has an important role to play not just in promoting policies, instruments, and behaviour that safeguard food security and nutrition but also in preventing individuals and companies from implementing damaging practices (see LAMBEK, 2014). For instance, this includes putting an end to harmful subsidies and watching out for bills that are incompatible with current legal obligations in terms guaranteeing access to safe, nutritious, culturally appropriate, and environmentally sustainable food. Therefore, alongside the need to protect the right to food, environmental law regulations and principles are also crucial instruments that ensure that food production promotes a healthy and balanced environment for present and future generations. This is another important dimension permeating the subject of pesticides. Given this, the following section briefly explores how Brazil regulates agricultural policy

9 Enshrined in the Article XXV of the Universal Declaration of Human Rights (1948), Article 11 of the International Covenant on Economic, Social and Cultural Rights (1967), and Article 12 of the "Protocol of San Salvador", the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights (1988).

and pesticides from the environmental law perspective, beginning with the Federal Constitution of 1988, followed by guiding legal principles and federal laws on the matter.

3 BRAZILIAN PESTICIDES AND ENVIRONMENTAL LAW: AN OVERVIEW

In Brazil,[10] as a rule, the issue of pesticides falls under the purview of environmental law (EL) and, for that reason, this section mainly focuses on provisions from this branch of law. In general terms, the country has an extensive and well-developed environmental legislation that dedicates attention to the promotion of environmentally-friendly food system practices as well as the regulation of activities and substances that pose risks to human health and the environment. All-in-all, Brazil provides an interesting regulatory framework for pesticides. Hence, to analyse the amendments proposed by Bill n. 6,299/2002, we first discuss how the national legal system perceives and regulates these substances from the environmental law perspective. There is a large body of scholarly work dedicated to better understanding the scope, reach, and structure of Brazilian environmental law and policies (please see, i.e., SARLET; FENSTERSEIFER, 2019; SILVA, 2019; LEITE; AYALA, 2020). For this article, we highlight the most important provisions and national environmental law principles related to pesticides.

3.1 Federal Constitution

The Brazilian Federal Constitution of 1988 expressly and succinctly addresses agricultural policy in Chapter III, Articles 184-191, which lay out provisions for land reform. Article 187 states that Brazilian rural policy should be planned and executed according to specific laws, considering issues such as economic instruments, research, and technology, market prices, among others. The Constitution does not refer directly to environmental issues in this Chapter. However, the legal basis and provisions for sustainable agriculture[11] can arguably be found throughout the text of the

10 Brazil is a Federal State formed by the indissoluble union of the Union, States, Municipalities, and the Federal District.

11 According to Ehlers (2008), in general terms, sustainable agriculture indicates a production system that ensures minimum environmental impacts, keeping natural resources and productivity for the long-term. It optimizes food production using internal inputs, satisfying human nutrition and income needs, as well as meeting the social needs of rural populations. Thus, "Sustainable agriculture" (or ecological agriculture) is understood here as a broad category that encompasses several types of sustainable agriculture, such as permaculture, natural agriculture, and agroecology.

Constitution, mainly in Chapter VI, which is specifically dedicated to the environment (BRASIL, 1988).

The "Ecological Constitution", as it is known, establishes general rules and guiding environmental law principles, recognizing the human right to an ecologically balanced environment. It provides that the environment "*is an asset of common use and essential to a healthy quality of life, and both the Government and the community shall have the duty to defend and preserve it of present and future generations*" (Federal Constitution/1988). In this context, it foresees that intergenerational equity and environmental protection should guide state action and its public policies, including those related to food and agriculture. Chapter VI also sets specific requirements for activities that are potentially damaging and for substances that can create risks to life, human wellbeing, and the environment, like pesticides. Article 225 stipulates that public authorities shall not just control the production, commercialization, and use of potentially harmful substances but also demand environmental impact assessments from the private sector before authorizing any economic activity that may result in significant environmental damages.

Concerning pesticides more specifically, one direct reference to the term can be found in the Constitution's text, which provides general guidelines for its advertisement (CODONHO, 2014). Nevertheless, there are several provisions that apply to agrochemicals management, such as those found in the chapters regarding economic activities, consumer defence, labour rights, public health, and the environment. The Brazilian Federal Constitution, therefore, acknowledges the healthy and balanced environment as a human right, supports the establishment of ecological forms of agriculture, and sets provisions for the proper risk management of potentially harmful substances. Based on that, the Constitution allows for the controlled use of pesticides within the country (FIORILLO, 2009). Such "control" is mainly regulated by the adoption of specific laws at the federal level (see subsection 3.3) whose drafting, enacting, enforcing, and monitoring processes should be guided by a set of environmental law principles. Among those, *three* are particularly relevant for this analysis and are concisely discussed in the following subsection.

3.2 Prevention, precautionary, and non-regression law principles

Before delving more specifically into the federal laws related to pesticide regulation, it is essential to mention some national environmental

law principles that contribute to the matter, namely the (i) prevention, (ii) precautionary, and (iii) non-regression principles. All three principles are directly applicable to pesticides, the first two related to the means, measures and instruments of control, and the latter to the levels of health and environmental protection. For a detailed discussion on the environmental law principles, please consult the manuscripts referred to at the beginning of this section.

The (i) *prevention principle* seeks to eliminate and reduce scientifically known and proven risks to the environment and human health. It is generally applied when there is scientific certainty about the dangers and risks caused by a specific economic/human activity (BAHIA *et al.*, 2015; LEITE *et al.*, 2004). Sadeleer (2008) stresses that the primary role of the prevention principle is to establish conditions for the public control of economic/human activities, which are increasingly based on concepts like the best available technology, best environmental practices, and clean production methods, among others. This is a foundational legal principle of several Brazilian Laws, including Law n. 6,938/1981 (National Environmental Policy Act).

On the other hand, the (ii) *precautionary principle* is the basis for risk management policies and works under the assumption that scientific uncertainty around the impacts of a particular activity or product cannot justify inaction from public authorities, especially on environmental and public health issues. This principle is part of Brazilian Environmental Law, expressly mentioned by the Biosafety law (n. 11,105/2005, Art. 1) and the Environmental Law Crimes Act (n. 9,605/1998, Art. 54, para. 3), among others. It prescribes that all necessary measures to eliminate risks to the environment and/or public health should be taken at the right time. In other words, public authorities shall take adequate action even when the risks or the cause-effect relation between these risks and the damaging results have not been scientifically confirmed conclusively (BAHIA *et al.*, 2015). The precautionary principle thus recommends an "*in dubio pro natura*" (when in doubt, favour the environment) behaviour, but not in an absolute sense. It means the risks and benefits involved must always be weighed on a case-by-case analysis, observing and respecting the proportionality principle. Additionally, the precautionary principle is adopted as the foundation for the reversal of the burden of proof; every time a substance, product or activity creates risks to the environment and to public health, the subjects or companies economically exploiting such products and/or

activities must prove they will not cause significant damages (BAHIA *et al.*, 2015; SADELEER, 2008). In this context, the precautionary principle is fundamental to prevent potential damages from the use of pesticides (CODONHO, 2014). The control provided by such a principle in judicial decision-making processes will, however, always be a palliative measure. Following this principle, is crucial to create and design long-term public policies prohibiting and/or limiting the use of pesticides, as well as encouraging pesticide-free agricultural systems.

Lastly, the (iii) *non-regression principle* is a relatively new principle in environmental law that is still evolving (BENJAMIN, 2011). As the name suggests, it prohibits a regression in environmental protection levels, or a regression of environmental law. In other words, this principle states that environmental and health obligations and commitments established by public regulatory instruments (such as legislation) must be kept and improved. Non-regression implies in increasingly allocating resources and developing pathways to ensure higher and better protection for the environment and public health (BAHIA *et al.*, 2015). There are many forms of regression; at the national level, for instance, environmental legislation has increasingly been subject to regressions through the change (or simplification) of procedures, the repeal or amendment of environmental rules, reducing protection or turning them ineffective, among others (PRIEUR, 2012). Of note, there is still a lot of scholarly discussion around the non-regression principle in Brazil. We corroborate its understanding as an environmental law principle deriving from its Constitution (please see BRASIL, 2012).

After this brief overview of the prevention, precautionary, and non-regression principles, which are overarching to the Brazilian federal laws, and should guide public policies and decision-making processes related to pesticides, we can now assess the state-of-the-art of the legal regulation currently governing the subject.

3.3 Brazilian Pesticide Act and other federal policies

As mandated by the Brazilian Constitution, adopting public policies for disease risk reduction, as well as controlling the production, commercialization, and use of substances that can pose risks to life and the environment falls under the purview of the Federal Government. In this context, Law n. 7,802 (known as 'Pesticide Act') was adopted in 1989 to regulate

research, experiments, production, registration, classification, packaging, labelling, transport, storage, commercialization, advertisement, use, import, export, and dispose of waste and packaging of pesticides, thereby laying out provisions concerning their entire life cycles (BRASIL, 1989). Decree n. 4,074 of 2002 later regulated this Act. Combined, these represent the main specific legal instruments of Brazil's legal framework for pesticides (BRASIL, 2002a).

According to Ferreira, Codonho, and Ayala (2012)(2012), the control measures established by Law n. 7,802 can be divided into two broad categories: (i) those relating to the control of the pesticide *per se* (e.g., the public authorization for commercialization and its reassessment), and (ii) those regarding the *use* of pesticides (such as the agronomist's prescription). The former category includes the *registration* of new pesticides with the public authorities. The registration process foresees and requires independent assessments and approvals from three different public bodies representing the Ministry of Public Health (Anvisa), the Ministry of Environment (IBAMA), and the Ministry of Agriculture. After the three approvals, the registration will be undertaken by the body whose scope is directly associated with the destination and purpose of the pesticide (e.g., the Ministry of Agriculture is responsible for the final registration of pesticides for agricultural purposes) (BRASIL, 2002a).

Registration is a mandatory requirement for the authorization of the commercialization, packaging, labelling, and commercial promotion of pesticides, among others. This requirement seeks to ensure environmental and public health safety standards, as well as to provide the public with clear and broad information about these agrochemicals, their use, and their potential risks. Moreover, based on the prevention and precautionary principles, there are cases where registration of the product is prohibited by law, namely: (a) when there is no antidote or methods available in the country for deactivating the components of the pesticide; (b) when they present teratogenic, carcinogenic, or mutagenic characteristics; (c) when they cause hormonal disturbances and damage to the reproductive system; (d) when they are more dangerous to humans than what was verified in laboratory tests; and (e) when they can damage the environment (BRASIL, 1989).

Once the registration process is finalized, the pesticide can be commercialized, imported, or exported. However, this is not an irrevocable decision; a reassessment is needed if new data on the negative impacts of

the authorized pesticide arises. Based on the precautionary principle, the reassessment of a pesticide is a control instrument that can lead to (a) the denial of a new registration (i.e. for a different usage of the pesticide), (b) the imposition of restrictions (i.e. regarding the place where the pesticide will be used), or, ultimately, (c) the cancellation of the registration of the given pesticide (BRASIL, 1989).

Regarding the second category of control measures, we can highlight three important tools: (a) the user's registration; (b) the agronomist's prescription; and (c) the correct disposal of pesticide waste (considered hazardous) and its packaging. Given the scope of this analysis, it suffices to highlight that the agronomist's prescription must contain a series of information about the user, territory, and crops where the pesticide will be applied, type of pesticide, and amount to be used, among other issues. Although the practical efficacy of the agronomist's prescription can be criticized for different reasons, its primary objective is to provide the previously mentioned inspection bodies with a more comprehensive overview of the pesticides used in the country (FERREIRA; CODONHO; AYALA, 2012). Moreover, Law no. 7,802/1989 successfully established minimum standards for the packaging, labelling, registration, commercialization, use, disposal, and advertisement of pesticides in Brazil (BRASIL, 1989). Although it is subject to some criticism from the socioenvironmental viewpoint, Almeida and colleagues (2017) claim that it is still is one of the most advanced and protective of human health and the environment worldwide. That is because it introduced more rigid criteria related to environmental and public health protection as well as to agronomic performance concerning pesticides.

In the years following the establishment of the Pesticide Act, diverse federal policies have been enacted to foster different, more sustainable food production models. According to Coelho (2001), the 'sustainable agriculture' phase of Brazilian agricultural policy began in 1995. It is marked by the adoption of a successful economic stabilization plan (*Plano Real*, in Portuguese) and by greater integration of environmental concerns into public policy and decision making, especially regarding agriculture and rural development. In this context, relevant laws have come into force since 1995. Among these, we can mention: (i) Law n. 10,831/2003,[12] addressing organic agriculture; (ii) Law n. 11,326/2006,[13] establishing the National

12 (BRASIL, 2003).

13 (BRASIL, 2006a).

Policy for Family Farming; (iii) Law n. 11,346/2006,[14] creating the National System of Food and Nutrition Security (SISAN, Portuguese acronym) to ensure the human right to adequate food, articulating it into national legislation; (iv) Law n. 12,512/2011,[15] establishing the Environmental Conservation Support Program and the Program to Promote Rural Productive Activities; and (v) Decree n. 7,794/2012,[16] establishing the National Policy on Agroecology and Organic Production.

Law n. 11,364/2006, the Food and Nutrition Security Policy Act (item iii), creates a policy framework for the subject in Brazil. This law can be considered a substantial step to overcome food insecurity in the country, as it creates the National System of Food and Nutrition Security (SISAN, Portuguese acronym) and enshrines the human right to food and food sovereignty as guiding principles. Therefore, it broadens and strengthens the range of possibilities for Brazilian citizens deprived of this fundamental right to hold the state and other stakeholders accountable. This policy act also makes clear that the adoption of other public policies concerning food security and nutrition must consider all the following dimensions: environmental, cultural, economic, regional, and social. Hence, they must ensure the supply of, and access to, food whilst promoting sustainability and healthy diets. The creation of SISAN made it clear that public health and the environment are important elements for the full realization of the right to food.[17]

Another relevant legal instrument is Decree n. 7,794/2012, which establishes the Agroecology and Organic Production National Policy (PNAPO, Portuguese acronym). Agroecology is a science that studies the design of sustainable foods systems, which translates into theory, a social movement, and a set of practices for 'sustainable agriculture' (GLIESSMAN, 2007; WEZEL *et al.*, 2009; VENÂNCIO, 2018). The latter is a term that also encompasses permaculture, organic production, and natural farming, among other models (CAPORAL *et al.*, 2004; EHLERS, 2008). Nevertheless, the uniqueness of agroecology is evident in its multiple facets (science, production system, and social movement)

14 (BRASIL, 2006b).

15 (BRASIL, 2011b).

16 (BRASIL, 2012).

17 Of note, the SISAN suffered a significant loss in 2019, with the shutdown of the National Council of Food Security and Nutrition (CONSEA, Portuguese acronym) by the new Federal Administration. Although further discussion of this topic is beyond the scope of this research, this exemplifies and personifies the dismantling of some policy structures that were putting the country on a more sustainable track.

and dimensions (social, economic, technical, environmental, and cultural) for the development of healthier and more sustainable food systems and lifestyles (VENÂNCIO, 2018). In Brazil, agroecology plays an important role in opposition to industrial agricultural practices. More specifically, the gradual and multilinear transitioning process toward ecological agriculture, known as agroecological transition (GLIESSMAN, 2007; GUTERRES, *et al.*, 2006), has been contributing to the phasing out of the use of agrochemicals. The development of this decree (which, as of January 2020, has not been converted into law) was marked by intense social pressure and active civil society participation. Although it did not meet all social demands, the decree represents a real landmark in terms of public policies on agroecology (VENÂNCIO, 2018). It is the first federal legal instrument to specifically address the subject, outlining guidelines and instruments to promote agroecology in Brazil, such as the supply of eco-friendly, contaminant-free products, the promotion of sustainable and just food production systems, and the conservation of natural ecosystems (VENÂNCIO, 2018). Furthermore, PNAPO was established as an umbrella policy, linking different policy subjects that previously addressed separately. The challenge is how to secure its continuity with changes in government (e.g., from a "government's policy" to a "state policy").

One of the key instruments created by PNAPO is the National Plan for Agroecology and Organic Production (PLANAPO, Portuguese acronym), whose goals include the development of a national program to reduce the use of pesticides (PRONARA, Portuguese acronym). The National Commission of Agroecology and Organic Production (CNAPO, Portuguese acronym), part of the national policy, created a workgroup comprising representatives from the government and civil society to draft the initial PRONARA proposal. The workgroup analysed a set of considerations, suggestions, and proposals for actions from documents of relevant Brazilian civil society and scientific forums/organizations (CNAPO, 2014). The synthesis of this material highlighted various concerns regarding the extremely high usage and consumption of pesticides in Brazil. In response, PRONARA was developed to guide and organize different actions toward (i) restricting the use, production, and commercialization of pesticides in Brazil; (ii) encouraging phasing out hazardous pesticides through the transition to sustainable agricultural systems; and (iii) setting up environmental education programs and raising awareness of the health and environmental problems caused by pesticides

(CNAPO, 2014). Former Minister of Agriculture, Katia Abreu, did not officially create PRONARA. Unsatisfied with the lack of political will to implement this program and based on the draft PRONARA, civil society groups proposed Bill n. 6,670/2016 to establish a National Policy for Pesticides Reduction, known as PNARA (Portuguese acronym). After two years of law-making procedures and despite the efforts of members of the rural caucus to obstruct the bill, it was approved in December 2018 by a special committee of the House of Representatives (GRIGORI, 2018). It is now waiting for the plenary vote and represents a completely different alternative to Bill n. 6,299/2002 (GRIGORI, 2018).

Despite all progress made in Brazil toward transitioning to sustainable agriculture, exemplified by the laws and policies outlined in this section, the prospects for it to become a reality are not optimistic. The current administration has publicly declared intentions to promote agribusiness and conventional agriculture in Brazil, without any specific attention to environmental safeguards. Also, the current Minister of Agriculture used to be one of the leading defenders of Bill n. 6,299/2002 when she was a Congresswoman. If approved, the amendments proposed will significantly impact agricultural policy in Brazil. Hence the importance of critically reviewing the Bill to assess whether it follows and complies with the multidimensional notion of food security, and national environmental law and its principles, respecting the rights to food as well as a healthy and balanced environment, is clear.

4 BILL N. 6,299/2002: A THREAT TO THE RIGHTS TO FOOD AND A HEALTHY ENVIRONMENT?

First, it is important to note that the Brazilian Congress' rural caucus has proposed several bills to amend the Pesticide Act since 2000. Most of these legislative proposals[18] have been merged and attached to Bill n. 6,299/2002, which is waiting for plenary voting in the Brazilian House of Representatives and, if approved, will revoke Law n. 7,802. It foresees several changes; therefore, this paper addresses those not complying with the notion of food security as well as to the national environmental law, including its principles. Such amendments will be divided, for didactical purposes, into three categories: (A) those related to the control of

18 Among them, it is Bill n. 3,200/2015, which presented the most radical and potentially dangerous changes to public health and the environment.

pesticides *per se*, including its registration, authorization, export; (B) those concerning their usage, encompassing mainly the need for the agronomist's prescription and the preventive use of pesticides; and (C) those related to other matters, such as the legal name of pesticides and their advertisement. The next subsection provides a didactic overview of these amendments.

Regarding the first category (A), as previously discussed, the pesticide registration process requires authorization from three governmental bodies/agencies (from the environment, public health, and agriculture sectors). That ensures the development of three independent assessments that analyse different dimensions: the impacts of the given pesticide on the environment and public health, and its agronomic efficacy. Therefore, the current registration process adopts a comprehensive and preventative approach. Under the argument of speeding up and 'facilitating' this process, Bill n. 3,200/2015 (merged into the Bill n. 6,299/2002) initially proposed to eliminate specific roles from the Health and Environment Ministries and to concentrate the power to register pesticides in the Ministry of Agriculture. To achieve it, the Bill envisioned the creation of a technical commission named *Comissão Técnica Nacional de Fitossanitários* (CTNFito, Portuguese acronym) (ALMEIDA *et al*., 2017), with an advisory, deliberative, and normative nature. The proposal triggered a backlash from civil society and scientific organizations, mirrored in a report, published in June 2018, by the five United Nations Special Rapporteurs. They expressed their concerns with this institutional arrangement, especially regarding the risk assessment process of scientific evidence and the high chances of having the Brazilian agricultural lobby controlling the decisions made by the commission (KNOX *et al.*, 2018).

The text of Bill n. 6,299/2002 was then amended, excluding the creation of CTNFito. Nonetheless, a thorough analysis of the new text reveals it still risks hallowing out the Environmental and Health Ministries' role in the registration process of pesticides used in agriculture. Whilst Law n. 7,802 conditions the pesticides registration to the compliance of directives and requirements made by the environmental, health, and agricultural governmental bodies, the Bill grants the exclusive competence to register and authorize pesticides for agricultural purposes to the Ministry of Agriculture, without the need for authorization from the other Ministries.[19] Further, the requirement of risk assessments for some registration

19 The Ministry of Environment would coordinate the registration process for agrochemicals utilized in aquatic environments, native forests, and other ecosystems.

processes provided by the Bill does not guarantee that health and the environment will be taken into consideration by the registration body. The assessments should be done by the applicants of the pesticide registration, pondering political, economic, and social aspects (which could undermine health and environmental protection), and ratified by the three Ministries. However, the Ministry of Agriculture can ratify the assessments without the need for authorisation from the other Ministries. Thus, it is not clear if the Environment and Health Ministries will have the veto power in those processes or if they will solely assume a technical support role, with no real participation in the decision-making process. The latter would increase the chances of biased and narrow-minded decisions, based only on economic and technical aspects.

Another change proposed concerns to the registration of generic and equivalent pesticides. Since 2006, there is a specific procedure in place for these products, which falls under the purview of the Health, Environment, and Agriculture Ministries. This procedure is based on international standards established by FAO and seeks to make it easier, faster, and *safer* to register pesticides equivalent to others already registered in the country. However, the Bill, once more, intends to concentrate the power of decision in the Ministry of Agriculture.

Bill n. 6,299/2002 expressly states that public authorities and the registering body must adopt measures that reduce bureaucracy and simplify the registration process. However, the loss of the balance of power between the different Ministries could result in an indiscriminate increase in new, generic, and equivalent pesticides being registered in Brazil, without proper consideration of public health and environmental aspects. Both amendments (A1), in this case, represent a regression in terms of human health and environmental protection levels.

Still with respect to the registration process, the Bill proposes changes regarding risk management. As mentioned before, the existing normative prohibits, among others, the registration of pesticides that have teratogenic, carcinogenic, or mutagenic characteristics, as well as when they may cause hormonal disturbances and damage to the reproductive system. Thus, pesticides with the potential to cause any of these risks, no matter the level of the risk, cannot be currently registered, commercialized, and used. In this regard, the Bill proposes (A2) that hazardous pesticides should only be prohibited when a "*unacceptable risk*" is demonstrated. The Bill brings a confusing and insufficient definition of what an "unacceptable risk" is and

explicitly rejects the use of the precautionary principle, which imposes the rejection of a pesticide registration when it offers risks to public health and the environment. According to Knox et al. (2018), this amendment injects additional uncertainties, reducing the accuracy of risk assessments conducted in the registration process. Furthermore, this approach is contrary to sound risk management practices used in other places, like the European Union. The Special Rapporteurs also stressed that flexibility in accepting pesticides risks often burdens the most vulnerable, such as low-income communities, rural workers, and children, among others, and that this could happen in Brazil if this Bill becomes law (KNOX *et al.*, 2018).

Concerning the deadline for the assessment, registration, and authorization of pesticides, existing Law does not fix a timeframe. Thus, the Bill proposes (A3) that public authorities would have up to 12 months to issue a decision; failing to do so would result in a temporary tacit registration or authorization for pesticides already registered for similar crops by at least three Organization for Economic Cooperation and Development (OECD) members. The intention of making the registration process more efficient is reasonable. What raises major concerns is the possibility of granting temporary registration or authorization in those cases where the public authorities cannot respect the timeframe, which may happen for different reasons. Giving authorization to a product before adequately assessing the risks it presents to public health and the environment for bureaucratic issues (not meeting deadlines) hugely weakens the prevention of possible damages that would burden the whole of society and the environment. Further, the registration or authorization of such pesticides would then take place without any assessment by Brazilian authorities. Although OECD members are considered to be "developed" countries, it is essential to understand that some of them do not always prioritize public health and, especially, the environment in their decision-making processes related to agribusiness. To adopt and maximize a preventative approach, the specificities of each country, region, and place must be taken into consideration in such decisions. Both amendments (registration for new pesticides and authorization for new crops) fail to comply with preventive principle and represent a regression on control levels, exposing public health and the environment to possible risks.

Still regarding the first category of amendments, there is a proposal to change the rules on exports. The existing regulation is often criticized because it allows importing pesticides banned in their countries of origin.

That means foreign agrochemical industries take advantage of Brazil's lower levels of protection (when compared to the country where they are based) and may sell in Brazil hazardous pesticides prohibited in their domestic market. Nevertheless, the existing normative at least requires an assessment and registration process for both imports and exports of pesticides, establishing a minimum control according to the Brazilian standards of health and environmental protection. However, the amendment proposed by Bill n. 6.299/2002 intends (A4) to exempt pesticides produced in Brazil for exportation from the registration process and the required agronomic, toxicological, and environmental assessments. Instead, only a "notice of export" would be required, through which the export company would simply communicate the registering body the name of the product and quantities. Such a change would create a significant impact on importing countries with low health and environmental standards of protection and without adequate risk reduction systems for pesticides (KNOX *et al.*, 2018), weakening the control levels of these substances. Further, it could directly affect the domestic market and Brazilian food system actors, as 20% of the agrochemicals consumed in the country originate from illegal sources (IDESF, 2019).

On the second category of amendments (B), related to the control of the use of pesticides, two propositions can be highlighted. First, (B1) as mentioned before, the law currently requires a compulsory agronomist's prescription for pesticide use, which should contain information related to the user and application of a given pesticide. This document provides more precise and extensive information to inspection bodies, as it specifies where, how, and when the pesticide will be used. Bill n. 6.299/2002 promotes an entirely different approach, proposing that pesticides can be used without an agronomist's prescription, weakening such control and making the data collection process more difficult. In such a scenario, the individual handling the pesticide would have more freedom to make such decisions, which could lead to unnecessary uses and applications. Second, (B2) different from current legislation, the Bill foresees the preventive use of pesticides. According to Almeida *et al*. (2017), this provision can contribute to the intensive use of pesticides, impoverishing biodiversity (which is beneficial to crops), generating species resistance to pesticides, in addition to unnecessary soil, water, and other types of contaminations and pollution. Both amendments of this category represent a regression of the control and protection levels.

The last category of proposed amendments (C) includes matters such as the legal name of pesticides and its advertisement. Current Law n. 7,802/1989 names pesticides as "agro-toxics" (*agrotóxicos* in Portuguese), defining them as products that cause physical, chemical, or biological processes with the purpose of altering the composition of the flora or fauna, including defoliants, desiccants, and growth stimulators or inhibitors (BRASIL, 1989). The name "*agro-toxics"* makes it evident that pesticides are potentially hazardous products that impose risks to public health and the environment. Bill n. 6,299/2002 proposes (C1) to rename them as "phytosanitary defensive and products of environmental control", dissociating them from their potential harmful risks and damages. Lastly, on pesticides commercial advertisements, Law n. 7,802/1989 requires that all adverts must contain clear warnings about the risks of the product to people, animals, and the environment. Not only should advertisements encourage users to carefully read the label and information provided by the manufacturer, they are also prohibited from showing visual representations of potentially dangerous practices of pesticides use. Bill n. 6.299/2002 proposes (C2) the exclusion of any regulation on pesticides advertisement, leaving it to future laws. These category (C) amendments affect the essential transparency of information on pesticides, potentially concealing the hazardousness and risks these substances offer to health and the environment. Both proposals weaken pesticide regulation, representing a regression in protection levels.

4.1 RESULTS' SUMMARY

This article briefly introduces three important elements for discussing the provisions of Bill n. 6,299/2002, specifically: (i) the state's positive and negative obligations regarding the human right to food linked to the multidimensional concept of food security and nutrition; (ii) environmental law principles – namely prevention, precaution, and non-regression – that should guide policy and decision making processes regarding pesticides; and (iii) the national environmental law provisions that regulate pesticides and safeguard the human right to a healthy environment. Moreover, it highlights Brazilian policies that have been creating an enabling environment for sustainable agriculture.

Through literature and documentary review, this paper highlights that the proposed amendments addressed earlier in this section will loosen and

weaken pesticide regulation in Brazil. If approved, the bill is highly likely to lead to a rise in the number of registrations, authorizations, and use of pesticides, without proper assessment of their socio-environmental consequences. This trend is clear in the mainstream economic and political pressures coming from the agribusiness industry. Thus, a regression in the control and protection levels of the law is likely to further increase pesticide usage in the Brazilian food production system. As a result, the food security's dimensions of food stability and food utilization will not be fully met, undermining the human right to food. As discussed, having access to safe food, free from contaminants, is fundamental for the full realization of this right. Apart from this, the proposals of the Bill highlighted in this paper do not comply with the prevention, precautionary, and non-regression principles, thus threatening the right to a healthy and balanced environment. Given this, Table 1 summarise the results of this article:

Table 1 Changes proposed by Bill n. 6,299/2002

Category		**Current rules**	**Proposed amendment**	**Identified risks**	**Principles**
A	**Pesticide *per se***	**Law n. 7,802/89 – Decree n. 4,074/89**	**Bill n. 6,299/2002**	**The amendment can cause**	**Non-compliance with:**
1	Registration of new, generic and equivalent pesticides for agricultural use	Actively engages three different Ministries (article 3/ articles 2 to 8 of the decree).	Conducted only by the Ministry of Agriculture (article 4).	i) the neglection of the health and environmental dimensions; ii) partial and non-systemic decisions	The non-regression principle
2	Risk management	Pesticides offering potential risks to health and environment are prohibited (article 3, §6/ article 31 of the decree).	Only pesticides with demonstrated "unacceptable risk" will be prohibited (article 4, § 3).	i) the reduction of accuracy of risk assessments; ii) the loosening of risk management procedures	The precautionary principle
3	Tacit registration and authorization	Absent.	It will be issued when public authorities fail to meet the deadline, and when a given pesticide is already registered in three OECD members (article 3, § 9).	i) commercialization and use of pesticides without any risk assessment conducted in Brazil	The non-regression and the prevention principles

Continua

Continuação

4	Exports	Full assessment and registration process are required (article 3/ articles 8, 16, and 17 of the decree).	Pesticides will be exempted from agronomic, toxicological and environmental assessments (article 17).	i) significant impact on health and the environment	The non-regression and the prevention principles
B	**Use of pesticides**	**Law n. 7,802/1989 – Decree n. 4,074/89**	**Bill n. 6,299/2002**	**The amendment can cause**	**Non-compliance with:**
1	Agronomist's prescription	Compulsory (article 13/ arts. 64-67 of the decree).	Creates the possibility of commercializing pesticides without the prescription (article 39).	i) weak and/or insufficient data; ii) low awareness levels from the general public	The non-regression principle
2	Preventive use of pesticides	Absent	The preventive use of pesticide can be prescribed by a qualified professional (article 39, § 1).	i) the intensive unnecessary use of pesticides; ii) biodiversity impoverishment; iii) species resistance to pesticides; iv) contamination and pollution	The non-regression principle
C	**Other matters**	**Law n. 7,802/1989 – Decree n. 4,074/89**	**Bill n. 6,299/2002**	**The amendment can cause**	**Non-compliance with:**
1	Terminology	`Agro-toxics` (article 2, I/ article 1, IV of the decree)	`Phytosanitary defensive and products of environmental control` (article 1 and 2, XXIX and XXX)	i) concealing or providing misleading information on potential hazardousness and risks	The non-regression principle
2	Commercial advertisement	Regulated (article 8, article 61)	Not regulated	i) misleading information, or lack thereof, to users and the general public on risks and correct use of pesticides	The non-regression principle

Source: Own elaboration.

CONCLUSION

Pesticides pose a series of complex risks to human health and the environment, challenging modern legal systems that struggle to address their side-effects. In this context, we can observe that some amendments

proposed by Bill n. 6,299/2002 on pesticide regulation for agricultural purposes go directly against the progress that has been made toward providing alternative policy pathways for sustainable agriculture in Brazil, such as the establishment of SISAN and PNAPO. Likewise, they clash with Brazilian environmental law principles, neglecting all forms of precaution and prevention (e.g., the temporary tacit authorization for chemicals already approved in other OECD countries) and representing a regression in terms of protection levels (e.g., excluding existing provisions on pesticide advertisements). Hence the bill undermines the constitutional human rights to food and to a healthy and balanced environment by promoting the flexibilization of Brazilian rules for controlling pesticides and their use, as the UN Rapporteurs stress. This represents a concerning trend in policy of attempting to weaken Brazil's environmental legislation, which finds support in the rural caucus of the Congress and is clear in its proposal to change the name from "agro-toxic" to "phytosanitary defensive." Ultimately, this seeks to camouflage the scientifically proven side-effects and risks of some of these chemicals.

Given the examples outlined in the first section, the Brazilian regulation for pesticides still needs improvement. Nevertheless, reducing the levels of protection is certainly not the answer to this challenge. On the contrary, it is necessary to rethink Brazilian federal laws toward more comprehensive human and environmental protection. Likewise, achieving the human right to food demands the State to fulfil its obligations, which includes taking proactive actions to prevent the adoption of acts like this bill.

REFERENCES

ALBUQUERQUE, A. *et al.* Pesticides in Brazilian freshwaters: a critical review. *Environmental Science: Processes & Impacts*, v. 18, p. 779-787, 2016.

ALMEIDA, M. D. *et al.* A flexibilização da legislação brasileira de agrotóxicos e os riscos à saúde humana: análise do Projeto de Lei n. 3.200/2015. *Cadernos de Saúde Pública*, Rio de Janeiro,v. 33, p. 1-11, 2017.

ALTIERI, M.; FUNES-MONZOTE, F.; PETERSEN, P. Agroecologically efficient agricultural systems for smallholder farmers: contributions to food sovereignty, *Agronomy for Sustainable Development*, v. 32, p. 1-13, 2019.

ALTIERI, M.; NICHOLLS, C.; MONTALBA, R. Technological approaches to sustainable agriculture at a Crossroads: an agroecological perspective. *Sustainability*, v. 9, n.3, p. 1-12, 2017.

ARAGÃO, A. Princípio da precaução: manual de instruções. *Revista do Centro de Estudos de Direito do Ordenamento, do Urbanismo e do Ambiente*, Coimbra, v. 2, n.22, p. 9-57, 2008.

ARANHA, A.; ROCHA, L. "Coquetel" com 27 agrotóxicos foi achado na água de 1 em cada 4 municípios. *Agência Pública***,** 15 abr. 2019. Available from: https://apublica.org/2019/04/coquetel-com-27-agrotoxicos-foi-achado-na-agua-de-1-em-cada-4-municipios-consulte-o-seu/. Access on: July 6, 2019.

BAHIA, C. M. *et al. Manual de Direito Ambiental*. São Paulo: Saraiva, 2015.

BECK, U. World at risk: the new task of critical theory. *Development and Society*, v. 37, p. 1-21, 2008.

BENJAMIN, A. H. Princípio da proibição de retrocesso ambiental. *In:* BRASIL. Consumidor e Fiscalização e Controle. *O princípio da proibição do retrocesso ambiental*. Brasília, DF: Senado Federal, 2011. p. 55-73.

BRASIL. Constituição (1988). *Constituição da República Federativa do Brasil de 1988*. Brasília, DF: Presidência da República, 1988.

BRASIL. *Lei n. 7.802, de 11 de julho de 1989*. Dispõe sobre a pesquisa, a experimentação, a produção, a embalagem e rotulagem, o transporte, o armazenamento, a comercialização, a propaganda comercial, a utilização, a importação, a exportação, o destino final dos resíduos e embalagens, o registro, a classificação, o controle, a inspeção e a fiscalização de agrotóxicos, seus componentes e afins, e dá outras providências. Available from: http://www.planalto.gov.br/ccivil_03/leis/L7802.htm. Access on: July 10, 2019.

BRASIL. *Lei n. 9.605, de 12 de fevereiro de 1998*. Dispõe sobre as sanções penais e administrativas derivadas de condutas e atividades lesivas ao meio ambiente, e dá outras providências. Available from: http://www.planalto.gov.br/ccivil_03/leis/l9605.htm. Access on: May 17, 2020.

BRASIL. *Decreto n. 4.074, de 4 de janeiro de 2002a*. Regulamenta a Lei n. 7.802, de 11 de julho de 1989, que dispõe sobre a pesquisa, a

experimentação, a produção, a embalagem e rotulagem, o transporte, o armazenamento, a comercialização, a propaganda comercial, a utilização, a importação, a exportação, o destino final dos resíduos e embalagens, o registro, a classificação, o controle, a inspeção e a fiscalização de agrotóxicos, seus componentes e afins, e dá outras providências. Available from: http://www.planalto.gov.br/ccivil_03/decreto/2002/d4074.htm. Access on: July 15, 2019.

BRASIL. Câmara dos Deputados. *Projeto de Lei n. 6.299, de 13 de março de 2002b*. Altera os arts 3º e 9º da Lei n. 7.802, de 11 de julho de 1989, que dispõe sobre a pesquisa, a experimentação, a produção, a embalagem e rotulagem, o transporte, o armazenamento, a comercialização, a propaganda comercial, a utilização, a importação, a exportação, o destino final dos resíduos e embalagens, o registro, a classificação, o controle, a inspeção e a fiscalização de agrotóxicos, seus componentes e afins, e dá outras providências. Available from: https://www.camara.leg.br/proposicoesWeb/fichadetramitacao?idProposicao=46249. Access on: May 17, 2020.

BRASIL. *Lei n. 10.831, de 23 de dezembro de 2003*. Dispõe sobre a agricultura orgânica e dá outras providências. Available from: http://www.planalto.gov.br/ccivil_03/leis/2003/L10.831.htm. Access on: July 15, 2019.

BRASIL. *Lei n. 11.105, de 24 de março de 2005*. Regulamenta os incisos II, IV e V do § 1º do art. 225 da Constituição Federal, estabelece normas de segurança e mecanismos de fiscalização de atividades que envolvam organismos geneticamente modificados – OGM e seus derivados, cria o Conselho Nacional de Biossegurança – CNBS, reestrutura a Comissão Técnica Nacional de Biossegurança – CTNBio, dispõe sobre a Política Nacional de Biossegurança – PNB, revoga a Lei n. 8.974, de 5 de janeiro de 1995, e a Medida Provisória n. 2.191-9, de 23 de agosto de 2001, e os arts. 5º , 6º , 7º , 8º , 9º , 10 e 16 da Lei n. 10.814, de 15 de dezembro de 2003, e dá outras providências. Available from: http://www.planalto.gov.br/ccivil_03/_Ato2004-2006/2005/Lei/L11105.htm. Access on: May 17, 2020.

BRASIL. *Lei n. 11.326, de 24 de julho de 2006a*. Estabelece as diretrizes para a formulação da Política Nacional da Agricultura Familiar e Empreendimentos Familiares Rurais. Available from: http://www.planalto.gov.br/ccivil_03/_Ato2004- 2006/2006/Lei/L11326.htm. Access on: July 15, 2019.

BRASIL. *Lei n. 11.346, de 15 de setembro de 2006b*. Cria o Sistema Nacional de Segurança Alimentar e Nutricional – SISAN com vistas em assegurar o direito humano à alimentação adequada e dá outras providências. Available from: http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2006/lei/l11346.htm. Access on: July 6, 2019.

BRASIL. Congresso Nacional. Senado Federal. Comissão de Meio Ambiente, Defesa do Consumidor e Fiscalização e Controle. *O princípio da proibição do retrocesso ambiental.* Brasília, DF: Senado Federal, 2011a.

BRASIL. *Lei n. 12.512, de 14 de outubro de 2011b*. Institui o Programa de Apoio à Conservação Ambiental e o Programa de Fomento às Atividades Produtivas Rurais; altera as Leis n.s 10.696, de 2 de julho de 2003, 10.836, de 9 de janeiro de 2004, e 11.326, de 24 de julho de 2006. Available from: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2011/Lei/L12512.htm. Access on: July 15, 2019.

BRASIL. Ministério do Desenvolvimento Agrário. *Estatísticas do meio rural 2010-2011*. Brasília, DF: s.n., 2011c.

BRASIL. *Decreto n. 7.794, de 20 de agosto de 2012*. Institui a Política Nacional de Agroecologia e Produção Orgânica. Available from: http://www.planalto.gov.br/ccivil_03/_ato2011- 2014/2012/decreto/d7794.htm. Access on: July 6, 2019.

BRASIL. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. *Programa de análise de resíduos de agrotóxicos em alimentos (PARA):* relatório de Atividades de 2011 e 2012. Brasília, DF: Anvisa, 2013.

BRASIL. Comissão Nacional de Agroecologia e Produção Orgânica. Proposta Pronara – Programa Nacional de Redução de Agrotóxicos. Brasília, DF: CNAPO, 2014. Available from: http://tmp.mpce.mp.br/orgaos/CAOMACE/fcca/artigos/PRONARA_CNAPO_FINAL.pdf. Access on: July 6, 2019.

BRASIL. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. *Programa de análise de resíduos de agrotóxicos em alimentos (PARA*): relatório das análises de amostras monitoradas no período de 2013 a 2015. Brasília, DF: Anvisa, 2016. Available from: http://portal.anvisa.gov.br/documents/111215/0/Relatório+PARA+2013-2015_VERSÃO-FINAL.pdf/494cd7c5-5408-4e6a-b0e5-5098cbf759f8. Access on: Dec. 5, 2019.

BRASIL. Ministério da Saúde. *Relatório nacional de vigilância em saúde de populações expostas a agrotóxicos*. Brasília, DF: s.n., 2018.

CAPORAL, F. R.; COSTABEBER, J. A. *Agroecologia:* alguns conceitos e princípios. Brasília, DF: MDA/SAF/DATER-IICA, 2004.

CARNEIRO, F. F. *et al.* Segurança alimentar e nutricional e saúde. *In:* CARNEIRO *et al. Dossiê ABRASCO:* um alerta sobre os impactos dos agrotóxicos na saúde. São Paulo: Expressão Popular, 2015. p. 46-89.

CODONHO, M. L. P. C. F. *Desafios para a concretização da agricultura sustentável no Brasil:* uma contribuição do Direito para a regulação do uso dos agrotóxicos. São Paulo: Planeta Verde, 2014.

COELHO, C. N. 70 Anos de Política Agrícola no Brasil: 1931-2001. *Revista de Política Agrícola*, Brasília, DF, ano 10, p. 3-58, jul./set. 2001.

CRUTZEN, P. The "Anthropocene". *In:* EHLERS, E.; KRAFFT, T. *Earth System Science in the Anthropocene.* Berlin: Springer, 2006. p. 13-18.

ECOSOC – UNITED NATIONS ECONOMIC AND SOCIAL COUNCIL. *Substantive issues arising in the implementation of the international covenant on economic, social and cultural rights:* general comment 12. New York: United Nations, 1999.

EHLERS, E. Agricultura sustentável. *In:* INSTITUTO SOCIOAMBIENTAL. *Almanaque Brasil Socioambiental*. São Paulo: ISA, 2008. p. 414-422.

FAO – FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. *Voluntary guidelines to support the progressive realization of the right to adequate food in the context of national food security.* Rome: FAO, 2005.

FAO – FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. *International Year of Family Farming 2014 Master Plan (final version)*. Rome: FAO, 2013.

FAO – FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. *Strengthening sector policies for better food security and nutrition results.* Rome: FAO, 2017. Policy guidance series.

FAO – FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. *Biodiversity for sustainable agriculture*: FAO's work on biodiversity for food and agriculture. Rome: FAO, 2018.

FERREIRA, H. S.; CODONHO, M. L. P. C. F.; AYALA, P. A. A tutela preventiva dos agrotóxicos no ordenamento jurídico brasileiro: Entre avanços e retrocessos. *In:* ARAGÃO, A. A. *et al*. *Agrotóxicos:* a nossa saúde e o meio ambiente em questão – aspectos técnicos, jurídicos e éticos. Florianópolis: FUNJAB, 2012. p. 243-238.

FIORILLO, C. A. P. *Curso de Direito Ambiental Brasileiro.* São Paulo: Saraiva, 2009.

GLIESSMAN, S. *Agroecology:* the ecology of sustainable food systems. Florida: Boca Raton, 2007.

GRIGORI, P. Veja o que pode mudar caso projeto de redução de agrotóxicos seja aprovado. *Agência Pública*, 11 dez. 2018. Available from: https://apublica.org/2018/12/veja-o-que-pode-mudar-caso-projeto-de-reducao-de-agrotoxicos-seja-aprovado/. Access on: July 6, 2019.

GUTERRES, I.; GÖRGEN, S.; VIVIAN, F. Os caminhos da transição: a longa passagem da agricultura química para camponesa ecológica. *In: Agroecologia militante:* contribuições de Enio Guterres. São Paulo: Expressão Popular, 2006. p. 17-27.

HERNÁNDEZ, A. *et al.* Toxic effects of pesticide mixtures at a molecular level: their relevance to human health. *Toxicology,* v. 307, p. 136-145, 2013.

IDESF – INSTITUTO DE DESENVOLVIMENTO ECONÔMICO E SOCIAL DE FRONTEIRAS. *O contrabando de defensivos agrícolas no País*. Foz do Iguaçu: IDESF, 2019. Available from: http://www.idesf.org.br/wp-content/uploads/2019/06/webversion2.pdf. Access on: May 22, 2020.

KIM, K.-H.; KABIR, E.; JAHAN, S. A. Exposure to pesticides and the associated human health effects. *Science of the Total Environment,* v. 575, p. 525-535, 2017.

KNOX, J. et al. *OL BRA 5/2018.* Geneva: s.n., 2018.

LAMBEK, N. Respecting and protecting the right to food: when states must get out of the kitchen. In: LAMBEK, N. *et al*. *Rethinking food systems:* structural challenges, new strategies and the law. San Francisco: Springer, 2014. p. 101-122.

LECK, H. *et al.* Tracing the Water–Energy–Food Nexus: description, theory and practice. *Geography Compass,* v. 9, p. 445-460, 2015.

LEITE, J. R. M. *Direito ambiental na sociedade de risco.* Rio de Janeiro: Forense Universitária, 2004.

LEITE, J. R. M.; AYALA, P. *Dano ambiental.* 8. ed. São Paulo: Forense, 2020.

MICHEL, P. Non-regression in environmental law. *Surveys and Perspectives Integrating Environment and Society*, v. 5, n.2, p. 53-56, 2012.

MINISTÉRIO DA AGRICULTURA libera mais 31 agrotóxicos. *Deutsche Welle*, 10 abr. 2019. Available from: https://www.dw.com/pt-br/ministério-da-agricultura-libera-mais-31-agrotóxicos/a-48281095. Access on: Apr. 16, 2019.

OLIVEIRA, L.; TOOGE, R. Número de agrotóxicos registrados em 2019 é o maior da série histórica; 94,5% são genéricos, diz governo. *G1*, 28 dez. 2019. Available from: https://g1.globo.com/economia/agronegocios/noticia/2019/12/28/numero-de-agrotoxicos-registrados-em-2019-e-o-maior-da-serie-historica-945percent-sao-genericos-diz-governo.ghtml. Access on: Jan. 13, 2019.

PAN – PESTICIDE ACTION NETWORK INTERNATIONAL. *PAN International List of Highly Hazardous Pesticides.* Hamburg: PAN, 2018.

PARDO, J. E. *Derecho del medio ambiente.* Madrid: Marcial Pons, 2008.

PEDLOWSKI, M. A. *et al*. Modes of pesticides utilization by Brazilian smallholders and their implications for human health and the environment. *Crop Protection*, v. 31, n. 1, 2012, p. 113-118, 2012.

PLOEG, J. D. Dez qualidades da agricultura familiar. *Agriculturas*: *Experiências em Agroecologia*, Rio de Janeiro, v. 1, p. 3-14, 2014.

ROSSET, P. The multiple functions and benefits of small farm agriculture in the context of global trade negotiations. *Development*, v. 43, p. 77-82, 2000.

SADELEER, N. *Environmental principles*: from political slogans to legal rules. Oxford: Oxford University Press, 2008.

SARLET, I. W.; FENSTERSEIFER, T. *Direito Constitucional Ecológico*. São Paulo: Revista dos Tribunais, 2019.

SILVA, J. A. *Direito Ambiental Constitucional.* 11. ed. São Paulo: Malheiros, 2019.

SHIVA, V. *The violence of the green revolution*: third world agriculture, ecology, and politics. Lexington: University Press of Kentucky, 2016a.

SHIVA, V. *Who really feeds the world?* The failures of agribusiness and the promise of agroecology. Berkeley: North Atlantic Books, 2016b.

STEFFEN, W.; CRUTZEN, P.; McNEILL, J. The Anthropocene: are humans now overwhelming the great forces of nature? *Ambio*, v. 36, n. 8, p. 614-621, dec. 2007.

STEFFEN, W. *et al.* The Anthropocene: conceptual and historical perspectives. *Philosophical Transactions of the Royal Society*, v. 369, p. 842-867, 2011.

VENÂNCIO, M. D. *A legislação agroecológica na instrumentalização e ecologização do direito*. Rio de Janeiro: Lumen Juris, 2018.

WEZEL, A. *et al.* Agroecology as a science, a movement and a practice. *Agronomy for Sustainable Development*, v. 29, p. 203-515, 2009.

WFC – WORDL FUTURE COUNCIL. *Scaling up agroecology*: future policy award. Hamburg: WFC, 2018.

WHO – WORLD HEALTH ORGANIZATION. International Agency for Research on Cancer. 2016. *Q&A on glyphosate*. Geneva: s.n., 2016. Available from: https://www.iarc.fr/wp-content/uploads/2018/11/QA_Glyphosate.pdf. Access on: July 6, 2019.

WILSON, C.; TISDELL, C. Why farmers continue to use pesticides despite environmental, health and sustainability costs. *Ecological Economics*, v. 39, p. 449-462, 2001.

ZIEGLER, J. *The right to food:* report by the Special Rapporteur on the right to food, Mr. Jean Ziegler, submitted in accordance with Commission on Human Rights resolution 2000/10. New York: UNHCR, 2001.

Article received on: 1/27/2020.
Article accepted on: 6/22/2020.

How to cite this article (ABNT):
POPE, K. et al. Social and legal implications of the bill No 6,299/2002 on pesticide regulation. *Veredas do Direito*, Belo Horizonte, v. 17, n. 38, p. 343-374, maio/ago. 2020. Available from: http://www.domhelder.edu.br/revista/index.php/veredas/article/view/1754. Access on: Month day, year.