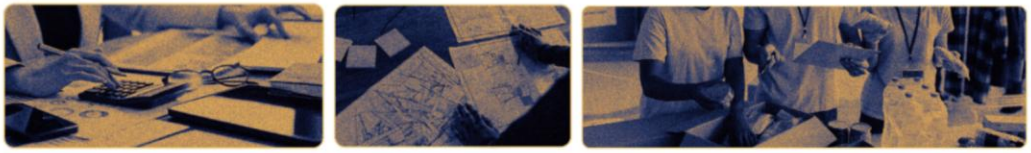

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EDITORA

ENVIRONMENTAL DAMAGE AND TRANSNATIONAL AGRIBUSINESS COMPANIES

OS DANOS AMBIENTAIS E AS EMPRESAS TRANSNACIONAIS DO AGRONEGÓCIO

DAÑOS AMBIENTALES Y EMPRESAS AGRONEGOCIADAS TRANSNACIONALES

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ABSTRACT

This article studies the environmental damage caused by transnational agribusiness corporations, addressing their causes, effects, and social and legal impacts. It analyzes the polluter-pays principle, which allows for civil, criminal, and administrative penalties for these companies. These companies must prioritize reparation for the damage caused, as profits should not result in the illegal use of environmental resources. Therefore, transnational corporations must adopt preventive measures to avoid harm. Therefore, if such damage occurs, reparation must be comprehensive, preferably in natura, to restore the affected species. This paper also examines the imprescriptibility of civil reparation for environmental damages, as defined by the Federal Supreme Court, as well as the Judiciary's stance on ecological governance, given the omissions of the Executive and Legislative branches. The text also addresses the reversal of the burden of proof and the possibility of recognizing collective environmental moral damages, as well as the cumulative obligations to act, refrain from acting, and compensate, aiming for full reparation. Finally, the article uses deductive and historical-comparative methods, analyzing major environmental disasters in Brazil, especially in the oil and mining sectors, in comparison with the practices of agribusiness companies.

Keywords: Environmental Damage. Transnational Corporations. Polluter Pays Principle. Ecological Judicial Governance. Environmental Disasters.

RESUMO

O artigo estuda os danos ambientais causados por transnacionais do agronegócio, abordando suas causas, efeitos e impactos sociais e jurídicos. Analisa o princípio do poluidor-pagador, que permite punições civis, penais e administrativas para essas empresas, que devem priorizar a reparação dos danos causados, pois o lucro não deve resultar no uso ilegal dos recursos ambientais e, sendo assim, as transnacionais devem adotar medidas

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preventivas para evitar danos. Assim, caso ocorram os referidos danos, a reparação deve ser integral, preferencialmente in natura, para restaurar as espécies afetadas. O presente trabalho ainda se propõe a apreciar a imprescritibilidade da reparação civil, por danos ambientais, definida pelo Supremo Tribunal Federal, bem como a postura do Poder Judiciário na governança ecológica, diante das omissões do Executivo e Legislativo. O texto também se debruça sobre a inversão do ônus da prova e a possibilidade de reconhecimento do dano moral ambiental coletivo e a cumulatividade das obrigações de fazer, não fazer e indenizar, visando a reparação integral. O artigo, por fim, utiliza métodos dedutivos e histórico-comparativos, analisando grandes desastres ambientais no Brasil, especialmente nos setores de petróleo e mineração, em comparação com as práticas das empresas do agronegócio.

Palavras-chave: Dano Ambiental. Empresas Transnacionais. Princípio do Poluidor-pagador. Governança Judicial Ecológica. Desastres Ambientais.

RESUMEN

Este artículo examina el daño ambiental causado por las empresas transnacionales del sector agroindustrial, abordando sus causas, efectos e impactos sociales y legales. Analiza el principio de quien contamina paga, que permite sanciones civiles, penales y administrativas para estas empresas. Estas deben priorizar la reparación del daño causado, ya que sus ganancias no deben derivar en el uso ilegal de los recursos ambientales. Por lo tanto, las empresas transnacionales deben adoptar medidas preventivas para evitar daños. En consecuencia, si dicho daño ocurre, la reparación debe ser integral, preferentemente in natura, para restaurar las especies afectadas. Este trabajo también examina la imprescriptibilidad de la reparación civil por daño ambiental, según la definición del Supremo Tribunal Federal, así como la postura del Poder Judicial sobre la gobernanza ecológica, dadas las omisiones de los poderes Ejecutivo y Legislativo. El texto también aborda la inversión de la carga de la prueba y la posibilidad de reconocer el daño moral ambiental colectivo, así como las obligaciones acumulativas de actuar, abstenerse y compensar, buscando la reparación integral. Finalmente, el artículo utiliza métodos deductivos e histórico-comparativos para analizar los grandes desastres ambientales en Brasil, especialmente en los sectores petrolero y minero, comparándolos con las prácticas de las empresas agroindustriales.

Palabras clave: Daños Ambientales. Empresas Transnacionales. Principio de Quien Contamina Paga. Gobernanza Judicial Ecológica. Desastres Ambientales.

1 INTRODUCTION

This article aims to examine the corporate environmental damages of agribusiness transnationals, especially their origins, causes, consequences, social impacts, legal response, among other aspects.

It is based on the principle of the polluter pays and the possible criminal and administrative punishments, in the face of transnational agribusiness companies, which cause environmental damage. In fact, it is certain that such companies will also be subject to the obligations of repairing *the destroyed space in natura*, on a preferential basis.

Thus, it is worth noting that the profit of such companies cannot be guided by situations such as illegal, illicit use of resources and environmental goods.

For this reason, the aforementioned principle will be studied from the perspective of a preventive action, in order to avoid the occurrence of environmental damage, although, as is known, the repressive bias of the aforementioned principle emerges when the damage triggered must be repaired.

In view of these statements, it is important to note that transnational companies in the agricultural sector must act in their operations, by means of a preventive nature, in view of the effective possibility of potential environmental damage, resulting from their production and processing processes, because if the damage occurs, it will be up to the offending company to adopt measures to fully repair the damage caused.

Therefore, the compensation for environmental damage can be *in natura* or through pecuniary compensation. Natural repair aims at the recovery of those species from polluted or destroyed space. However, if natural reparation is not possible, pecuniary reparation must be made. However, this type of reparation is surrounded by a complexity of estimation, which implies an analysis by environmental experts specialized in the area of knowledge of the identified situation.

In addition, the article examines the thesis of the imprescriptibility of the claim for civil reparation for environmental damage, established by the Federal Supreme Court in 2020, as well as the figure of ecological judicial governance, exercised by the Judiciary over the protection of the environment, through the revisions and corrections of postures of omission or action of the Executive and Legislative Branches.

The article also examines the possibility of reversing the burden of proof, in legal disputes involving companies that cause damage to natural resources, in view of the objective rule, which aims to equalize the forces of the parties to the proceedings, in the face of the great technical, technological and economic power of transnational companies, whether in relation to the citizen or in relation to an affected local community. With this inversion, it is up

to the polluting or degrading transnational company to prove that it has not perpetrated the environmental offense.

Thus, the aim of this article is to highlight the relevance of prevention and repression actions, in relation to environmental damage, practiced by transnational companies in the agriculture and livestock sector.

Thus, through the deductive method, comparative history, based on research, analysis and bibliographic review, this article is justified in view of the importance of understanding environmental issues for the construction of a new order guiding economic activity, so that economic development can expand social justice, without forgetting that the resources of nature are indispensable to the continuation and conservation of species, and its finite character must be evidenced and evaluated in its use, in order to avoid its extinction and to preserve a healthy environment with ecological balance, with respect, at the same time, for the dignity of the human person and the Law of Nature.

2 AN ANALYSIS OF THE POLLUTER PAYS PRINCIPLE

To understand the polluter-pays principle, we first need to be clear about the understanding of the figure of environmental damage. In this sense, Bessa Antunes (2015, p. 126) takes the following position:

> It is pollution that, exceeding the limits of the negligible, causes adverse changes in the environment, legally classified as environmental degradation. The fact that it is capable of causing environmental disvalue deserves reflection. Environmental damage, that is, the serious consequence to the environment of a lawful act or an unlawful act, is not legally simple, since not infrequently adverse environmental changes are legally admitted, through certain criteria that will be addressed later in this work. Although the environment is conceived as a totality, a unit that brings together a set of goods and values, material and immaterial, not being limited to being merely a sum of these same goods and values. What is certain is that the environment is composed of goods of different classes, different dominial regimes and other elements that need to be clearly identified and defined so that one can be clear about the damage that is being talked about. One cannot, under penalty of extreme methodological confusion, confuse the damages that harm health with those that affect the aesthetic conditions of the environment, for example.

Thus, environmental damage is that considerable harmful modification in the environment that the Law treats as degradation. However, there are damages that are deleterious to health and others that destroy the environment in the aesthetic aspect. Therefore, Celso Fiorillo (2025, p. 62) perceives environmental damage as follows:

> (...) damage is the injury to a legal good. In the event of injury to an environmental asset, resulting from an activity practiced by an individual or legal entity, public or private, which is directly or indirectly responsible for the damage, there is not only the characterization of the damage but also the identification of the polluter, the one who will have the duty to indemnify him.

Environmental damage would therefore be the harmful aggression to an environmental good, so that its cause has the duty to pay the compensation. Therefore, in a systematic way, Bessa Antunes (2015, p. 126-127) categorizes and explains the classes of environmental damage:

> Environmental damage is, like pollution, a general category within which several others are included. A first class of environmental damage consists of: (i) ecological damage, which is the adverse alteration of the biota as a result of human intervention. There are also others such as damages: (ii) to health, (iii) to productive activities, (iv) to safety, (v) to well-being and many others that affect goods that, integrating the concept of environment, are not reduced to flora, fauna or minerals. It should be noted, however, that there is environmental damage with mixed characteristics. It is possible to imagine an unfavorable alteration of the biota that causes aesthetic damage to the environment and also affects the safety and well-being of the population, damage to property and economic activity, such as landslides, landslides and floods. Thus, it is necessary to decompose the elements that make up the damage in concrete so that the exact measure of its recovery and repair can be obtained. Therefore, measures aimed at the restoration of the degraded physical environment will be necessary, aimed at the restoration of economic activities, repair of material damage, care for health problems, etc. Thus, damage that is not directly caused to the biota should be considered as indirect or reflex environmental damage.

From the explanation presented, it is clear that environmental damage can be classified as ecological damage (which deteriorates a certain biome), damage to health, damage to productive activities, damage to safety, damage to well-being and many other diverse ones that affect environmental goods, which are not limited to animals and plants.

Such damage can even occur in a compound form, affecting two or more of these environmental assets. In this case, recovery and repair must be complex, covering all types of environment affected. In fact, the Federal Constitution of 1988 establishes in article 225, paragraph 3 the following:

> Conducts and activities considered harmful to the environment will subject offenders, individuals or legal entities, to criminal and administrative sanctions, regardless of the obligation to repair the damage caused.

It is true that the general criterion for civil liability in the environmental area enshrines the so-called objective fault, according to which it is not necessary to demonstrate the fault

of the agent, but only the conduct, the production of damage and the causal link. This idea implies that everyone who pollutes must pay according to the effects of the contamination produced.

Thus, it is true that in most countries there are criteria that adopt levels of pollutant emissions, but this fact does not allow us to conclude that the existence of the polluter-pays principle results in a right to pollute, through the payment of compensation. In fact, this principle is detailed by Celso Fiorillo (2025, p.53) as follows:

> We can identify in the polluter-pays principle two orbits of scope: a) it seeks to avoid the occurrence of environmental damage (preventive character); and b) once the damage has occurred, it aims at its reparation (repressive character). Thus, at first, the polluter has the duty to bear the expenses of preventing damage to the environment that his activity may cause. It is up to him to use instruments necessary to prevent damage. In a second orbit of scope, this principle clarifies that, if damage to the environment occurs due to the activity carried out, the polluter will be responsible for its repair.

Therefore, the polluter-pays principle has currently been interpreted by many in an erroneous way, as it is the duty of the government to observe the legislation in force and, if necessary, not to grant the necessary authorizations for the implementation of the project.

From the aforementioned constitutional provision, it is clearly noted that legal entities, including transnational corporations, that harm the environment will suffer punitive consequences in the criminal and administrative spheres, and will also have to pay for the natural reparation of the degraded area.

Therefore, the taxonomy indicates that the polluter-pays principle is provided for in article 4, item VII, of Law No. 6,938/81 and in Principle 16 of the Rio Declaration of 1992, which impose on the polluter and the predator the obligation to recover and/or indemnify the damages caused and the user-pays principle, also provided for in article 4, item VII, of Law No. 6,938/81, which determines that the user contributes to the use of environmental resources for economic purposes.

For this reason, the polluter pays principle is also applicable to transnational agribusiness companies in the event that they cause environmental damage through the illicit use of natural resources. Thus, transnational corporations in the agribusiness sector that degrade the natural environment, either by illegally deforesting forest biomes or polluting surface or groundwater or even by degrading or polluting the soil, will be subject to the applicability of this principle.

In this regard, Bessa Antunes (2015, p. 148) emphasizes that the polluter-pays principle (PPP) differs from the principle of responsibility, as it aims to "prevent damage to

the environment from being used as subsidies for economic activity, unbalancing competitors in the market, or, at least, to reduce its impact". Thus requiring the "imposition of an environmental cost on those who use the environment for economic benefit". With this, the author emphasizes that "the delimitation and charging of a price for the use of the environmental resource seek to burden the economic agent, in proportion to the use of greater or lesser amount of resources". He concludes his thought by explaining that:

> The basic idea that guides the PPP is that society cannot bear the costs of an activity that benefits a single individual or a single group of individuals. Therefore, the application of a measure of justice that is based not on responsibility, but on solidarity, is sought. Solidarity, in the specific case of the application of the PPP, is based on the following pillars: (i) preventive action and (ii) clear identification of the environmental cost. Preventive action is done to the extent that it is established that the environmental cost is an important part of the general costs of the activity, it has the ability to add one more variable, to be examined by the entrepreneur, who, with this, analyzes the possibility of not using the resource. It is also important to have greater environmental efficiency, because the most environmentally efficient companies have lower costs. This set of activities, effectively, by reducing the use of environmental resources, act to prevent future damage. The clear identification of costs is also important, because consumers and competitors can have a precise notion of the level of environmental care and the existence or not of any subsidy to the activity (Antunes, 2015, p. 148).

For this reason, the polluter-pays principle aims to prevent the environmental damage perpetrated by a company from functioning as a factor of profit, of economic benefit, to the extent that a cost is imposed for this misuse of resources.

With this, it can be stated that the PPP aims both to prevent the occurrence of environmental damage, revealing its preventive character, and to promote the reparation of the damage that occurred, emerging its repressive face. Therefore, the potential polluter must bear the expenses of preventing the environmental damage that its activity may generate, as it is up to it to use the necessary means to prevent the damage. For this reason, if damage to the environment occurs as a result of the activities carried out by companies, including transnational companies in the agribusiness sector, the polluter will be responsible for repair.

The repressive aspect of the polluter-pays principle is related to civil liability, but it does not have the character of a penalty, much less is it subject to administrative infraction, although there may be both the cumulativeness of these, as well as the existence of the practice of crimes, as provided for in article 225, § 3 of the CF/88.

Therefore, in the analysis of the PPP, issues related to strict civil liability, priority of specific reparation of environmental damage and solidarity to bear the damage caused to the environment are focused.

In fact, in the strict liability for reparation of damages, it implies that without value judgment on the acts of the responsible party, it is satisfied with the demonstration of the damage and its relationship with the acts of the agent, which allows us to say that companies, including transnational companies in the agribusiness sector, which carry out their activities, must assume the risks of their activities and in the event of the occurrence of environmental damage, Reparation is necessary. In other words, we have that the legal regime of this type of liability requires the reparation of damage, without the need to demonstrate the fault of the causative agent, and it is sufficient to prove the damage and the causal link between the conduct and the loss.

On the other hand, many believe that an efficient environmental policy is one that creates conditions for economic agents to internalize the costs of the degradation that they themselves cause. Thus, the State's action would be necessary, as Ribeiro Romero (2012, p. 66) explains, "only to correct this market failure, either through privatization or through the pricing of natural resources".

However, by placing the environmental issue only as a market failure, it is clear that the solution to the problem would be contained in the economy itself. In this way, the States, in accordance with the industry and the market, would continue to consider environmental goods as commodities, mobilizing the institutions that should be linked to the environmental commitment as instruments of environmental degradation because they are guided by an idea, even if properly elaborated, but still on the same basis as forestry, in the resilience of the environment so that everything possible can continue to be extracted from it. This view understands Brazilian Environmental Law as a mechanism for recognizing a model of "controlled depredation", aimed at the interests of the market and industry.

This line of thinking, by the way, does not delve into the polluter-pays principle, which according to would (2003, p. 23) "can be understood as a mechanism for allocating the environmental costs associated with economic activity". This principle, in essence, provides "environmental policy instruments that States use to promote the internalization of environmental costs linked to the production and commercialization of goods and services" and, therefore, can be invoked as an aid to the precautionary principle.

In this way, negative externalities or external costs "should have negative prices because they mean loss of utility" (MOTTA, 2009, p. 183). Therefore, the study of externalities, associated with the environmental principles currently in force, especially the precautionary principles and the polluter-pays principle, are forcing companies to adopt internalization mechanisms to assume responsibilities that were previously transferred to

society or the State. In this way, the precautionary principle is understood as a risk management instrument aimed at avoiding damage (WEDY, 2020, p.70).

In addition, in order to understand the PPP, it is necessary to be clear about the teaching of Aragão (1997, p. 42) when he explains that: "polluters are called upon to bear the cost of the environmental resources they use, so that they can be managed and used sparingly. This is the meaning of the formula 'polluter pays.'" Thus, the author continues, in the face of economic liberalism and the absence of property rights, "defined over certain environmental goods generate the unequal allocation of scarce resources and an unjust enrichment of the stronger party (the polluter) at the expense of the weaker (the polluted and the community in general)".

Furthermore, the polluter-pays principle, according to would (2003, p. 23) "can be understood as a mechanism for allocating the environmental costs associated with economic activity". This principle, in essence, provides "environmental policy instruments that States use to promote the internalization of environmental costs linked to the production and commercialization of goods and services" and, therefore, can be invoked as an aid to the precautionary principle.

With regard to the compensation of damage, it can be operated in two ways: *in natura* or in pecunia. The preferred form is natural reparation, through the effective and direct recomposition of the damaged environment. However, if this is not possible, pecuniary compensation is made, the value of which may be difficult to estimate, which leads to the practice of appraisal and the preparation of an expert report.

Furthermore, it is worth noting that the natural repair of a damaged ecosystem is quite difficult and complex, in view of the thousands of plant and animal living beings that inhabit such a space and that have been developing over thousands of years.

As mentioned, everyone, that is, individuals or legal entities, under public or private law, including transnational companies in the agribusiness sector, can be considered environmental polluters and degraders, under the terms of article 225 of the Federal Constitution.

Pollution will occur with environmental degradation, with the occurrence of any adverse change in the characteristics of the environment, as dictated in article 3, item III, letter "a" to "e". It is noted, however, that human action is the main responsible for the deterioration of the environment, since the modification we make in nature implies an increase in pollution and destruction, even if it is to a reduced degree. In this sense, we need to bring up the lesson of Ribeiro Romero (2012, p. 79) about the processes of environmental degradation resulting from human activities:

> The unbalanced thermodynamic effects of human activities result from two sources. The first source of imbalance is the expansion of human occupation of space. Rich estuarine ecosystems give way to cities and ports; Huge spaces of nature are radically transformed by agro-silvo-livestock. The second is the introduction of materials and energy from exogenous sources into the system. The minerals present in the Earth's crust at levels of concentration (mines) that economically justify their exploitation are inert, that is, they do not interact or interact only marginally with biological activities in the ecosphere. The mining, transformation and consumption of these materials result in the production of waste that will be dispersed in the ecosphere, forcing ecosystems to adapt processes to absorb them. Depending on the amount, this waste represents a source of pollution capable of affecting, or even destroying, the ability of ecosystems to provide services

To reinforce this understanding and allow the application of the polluter-pays principle, the General Repercussion Theme 999 of the Federal Supreme Court adopted the following thesis: "The claim for civil reparation of environmental damage is not subject to statute of limitations".

Thus, we see that the evolution of jurisprudence is an important progress in the search for accountability of environmental offenders, which can often be time-consuming, whether in the investigation, or in the identification of the damage itself and its author, that is, in the procedural delineation.

3 ECOLOGICAL JUDICIAL GOVERNANCE: THE JUDGE-STATE AND ENVIRONMENTAL PROTECTION

The Judiciary also exercises ecological protection, reviewing the actions and omissions of the Executive and Legislative branches. In fact, as Sarlet and Fensterseifer (2021) point out, non-compliance with the constitutional norm, by action or omission, violating the fundamental right to live in a balanced and healthy environment, is subject to correction of the conduct of the Legislative and Executive Branches by the Judiciary.

Therefore, if transnational companies in the agribusiness sector violate the constitutional precept, making illegal use of natural resources, causing damage, they will suffer lawsuits for the due reparations, to be set by the Judiciary.

Environmental degradation occurred by action or omission of the Legislative or Executive Branches and transnational agribusiness companies will be subject to the scrutiny of the Judiciary, when judging the lawsuits that are handled.

This safeguarding of nature in the jurisdictional sphere, as a normative-constitutional imposition, is understood as ecological judicial governance, as pointed out by Ingo Sarlet and Thiago Fensterseifer (2021).

Ecological judicial governance emphasizes the role of the Brazilian Judiciary in protecting the environment, promoting the application of environmental laws, compliance with fundamental rights to nature, and an ecologically balanced environment.

According to Herman Benjamin (1999, p. 51-52), ecological judicial governance has gone through three phases in legislative evolution. The first phase, marked by intense "*unregulated exploitation or environmental laissez-faire*", built with iron and fire. This period runs from the year 1500 to approximately the beginning of the second half of the twentieth century and was marked "*by a distorted view of the enemy nature*", with very little legislative regulation, "with the exception of a few isolated norms that did not aim, in their main vocation, to protect the environment as such". In the second phase, called the "fragmentary phase", the legislator is perceived as "already concerned with broad categories of natural resources, but not yet with the environment itself considered". In this period from the 1960s until the enactment of the National Environmental Policy Law (Law 6.938/81), the degradation of the environment is seen in an incipient way, operating "on the ethical level, through *utilitarianism* (protecting only what had economic interest)", and in the "formal sphere *fragmentation* prevailed, both of the object (the ambient slicing, which is still holistically denied an identity of its own) and, even as a consequence, of the legislative apparatus". With the enactment of Law 6.938/81, the third period was inaugurated, called *the holistic* phase, in which the environment began to be protected "in an integral way, that is, as an ecological system", since "the parts are protected from the whole and with evaluative autonomy (it is, in itself, a legal good)".

In addition, this governance is constitutionally legitimized by the guarantee of the inalienability of judicial control of any injury or threat of injury to the right, in accordance with the provisions of article 5, item XXXV of the Federal Constitution.

Within the scope of this ecological protection exercised by the Judiciary, there are several procedural instruments that can be handled, as highlighted by Ingo Sarlet and Thiago Fensterseifer (2021):

a) Public Civil Action: which, according to article 5 of Law No. 7,347/85, has as legitimate assets, the Public Prosecutor's Office, the Public Defender's Office, the Public Administration (Union, States, Federal District and Municipalities), the Indirect Administration (autarchies, public companies, foundations and mixed-capital companies) and associations;

b) Popular Action: which presents as active legitimacy the exclusive right of any Brazilian, who is in full enjoyment of his political rights, to the protection of public, historical, cultural heritage or administrative morality.

c) Actions arising from neighborhood rights: filed by citizens to curb possible anti-environmental conduct.

These legal tools channel the inspection of polluting conducts by public and private agents, including the activities of transnational agribusiness companies, in citizen defense of natural resources, which are fundamental for human, animal and plant survival, considering that environmental goods have a finite character. Therefore, these lawsuits reveal themselves as instruments of political action and the exercise of citizenship in the context of a direct and participatory democracy.

Thus, it is clear that the Judiciary has a proactive and protective role for natural environmental rights in ecological disputes. In fact, when examining the judgment on the new Forest Code (Law No. 12,651/2012) that took place in the STF (ADC 42/DF), which discussed the constitutionality of the aforementioned law, in 2018, and declared the constitutionality of several of its provisions, Ingo Sarlet (2024) recalls that, at the time, our larger Text was qualified as a *Green Constitution,* highlighting that:

> In addition, the STF is also responsible for affirming the circumstance that environmental protection has a double dimension in the Brazilian legal system, operating both as an objective and task of the State, as well as as as a fundamental right and duty of the individual and the collectivity, as the following excerpt from the judgment of the aforementioned case of the new Forest Code demonstrates: “(...) the environment assumes a twofold function in the legal microsystem, insofar as it is simultaneously embodied in the right and duty of citizens, who at the same time position themselves, also simultaneously, as creditors and as debtors of the respective protection obligation"

In addition, in disputes involving damage to natural resources perpetrated by transnational companies in the agribusiness sector , it is also possible to reverse the burden of proof, as a way to ensure the "parity of arms" of the parties. In fact, the burden of proof in environmental matters is based on the hyposufficiency and technical difficulty of the victim and the persons entitled to file the action aimed at repairing the environmental damage. As is known, in several concrete situations the test is complex and requires specific technical knowledge.

However, the agent causing environmental degradation has the technical control and documentation necessary to prove the safety of its activities or the absence of any impact causing injury to the environment. In fact, in view of the precautionary principle, it is up to the entrepreneur of the potentially dangerous activity to prove the safety of his enterprise. Therefore, any evidential difficulty must fall on the one who has the technical knowledge and the means to verify the absence of damage.

In this sense, Precedent 618 of the Superior Court of Justice stated that: "The reversal of the burden of proof applies to actions of environmental degradation".

Thus, the Brazilian Courts recognize the management of environmental actions as a legitimate form of action in defense of the constitutional-ecological order and the fundamental right to the environment, within the scope of a participatory democracy, whether at the collective level or at the individual level. Thus, in relation to the Public Civil Action, Morato Leite and Araújo Ayala (2020, p. 282) clarify that:

> The public civil action system did not restrict the object of the action to the pecuniary aspect, but expressly added the possibility of the obligation to do or not to do. Thus, the main object of the environmental collective action, observing the conditions for the imputation of environmental damage, was to instrumentalize the legitimate party with a double purpose in its claim, that is, compensation and, jointly, the obligation to do or not to do. It is believed that the legislator was right to institute this double objective, since environmental damage requires, in addition to ecological financial compensation, which is a substitute, a mechanism that ceases the polluting activity and/or recovers the environmental damage.

In the context of the Public Civil Action, therefore, it can be brought both for the purpose of pecuniary reparation of the environmental damage, and for the purpose of demanding an obligation to do or not to do, that is, the natural recovery of the degraded area and the cessation of the harmful conducts to that environment that has been attacked. In this sense, Morato Leite and Araújo Ayala (2020, p. 282) explain that:

> In addition to the dual objective of the collective treatment of public civil actions, already highlighted, with the amendments to Law 8,078/1990 (Consumer Code), and especially those expressed in article 83, today all types of actions aimed at protecting liability for environmental damage are possible. This fact means a wide opening in the public civil action system, leading to the possibility of proposing actions of cognizance in any of its declaratory, condemnatory, positive and negative constitutive, execution, precautionary and even mandatory species, that is, without limitation as to its object.

Therefore, the breadth of the object of a Public Civil Action for environmental protection is perceived, which is not limited, and such actions may be of a declaratory, condemnatory, constitutive, deconstitutive nature, and also executory, precautionary and mandamus.

On the other hand, in the individual hypothesis, the Superior Court of Justice has been recognizing the Environmental Popular Action as an instrument of great potential for the structuring and sedimentation of ecological citizenship.

In this regard, Moreira Mendonça (2021, p. 203-204) observes that:

> Therefore, despite the fact that the structuring of the popular action, in its genesis, is aimed at repairing damages, such action can be handled when the contested act is

> contrary to the fundamental right to an ecologically balanced environment, assuming a preventive bias. Another relevant aspect to be highlighted is regarding the object of the popular action, traditionally restricted and aimed at the invalidity of acts performed by the Government. As is well known, especially in environmental matters, the acts often result from private entities, which would rule out the incidence of the popular constitutional remedy. However, it should be noted that current jurisprudence has understood that the expression act should have an expanded interpretation, with more elastic content, comprising both commissive and omissive acts, since the constitutional rule imposes on the Public Power the duty of prevention and protection of the environment.

However, Moreira Mendonça (2021, p. 204) based on the analysis of REsp No. 889.766/SP of 2017 of the Superior Court of Justice, understands that "it is possible to argue that if a private entity disrespects environmental standards, causing damage or risk of damage to the environment, the intention of the popular action will be to prohibit the act that is being practiced, provoking the action of the State (omission) to do so".

In addition, any citizen can file the Popular Action individually, without the presence of an intermediary entity, being exempt from legal costs and liens.

On the other hand, public hearings also seek popular participation, as a way to consolidate itself as one of the democratic instruments in force in our legal system. In the Federal Supreme Court (STF), public hearings began on April 20, 2007, with the judgment of the constitutionality of the Biosafety Law (ADI 3.510), under the rapporteurship of Justice Ayres Britto. The holding of judicial public hearings allows the participation of various social actors in issues of great social relevance, such as ecological ones, which involve the interest of the entire community.

On issues involving environmental protection, directly or indirectly, the Federal Supreme Court has already held the following public hearings:

a) Possibility of using embryonic stem cells in research and treatments within the scope of the Biosafety Law, on 05/20/2007, referring to ADI 3.510;
b) Importation of used tires, on 06/27/2008, referring to ADPF 101;
c) Judicialization of the right to health, on 04/27, 28 and 29/2009, and 05/04/06 and 07/05/2009, regarding Regimental Appeals in Suspensions of Injunctions, Preliminary Injunctions, and Security Orders;
d) Prohibition of the use of asbestos, on 08/24 and 08/31/2012, referring to ADI 3,937;
e) Electromagnetic field of electric power transmission lines, on 03/06/06 and 03/08/2013, referring to RExt. 627.187;
f) Burning of sugarcane straw, on 04/22/2013, referring to RExt. 586.224;
g) New Forest Code, on 04/18/2016, referring to ADIs 4901, 4902, 4903 and 4937;
h) Climate Fund, on 09/21 and 09/22/2020, referring to ADPF 708;

i) Amazon Fund, on 10/23 and 10/26/2020, referring to ADO 59 (Direct Action of Unconstitutionality by Omission).

However, these public hearings, in practice, are still widely criticized, as they do not demonstrate the effective consolidation of democratic processes. In this sense, the criticism formulated by Tainah Sales (2022, p. 86-87) is quite pertinent:

> If it is possible to affirm that the hearings promote the opening of the STF to society in a new paradigm, on the other hand, the traditional ways of conducting hearings and deciding seem unchanged36. There continues to be the prevalence of "encyclopedic knowledge" of each minister, to the detriment of the construction of a collective decision. Not even the introduction of public hearings seems to have removed this character, resulting in a judgment in which there is a mere sum of individual votes of the magistrates. The decision-making phase does not accommodate a collegial engagement in the sense thought by Habermas37, since each one continues to vote in his or her own way. In the same sense, Miguel Godoy points out: "[...] the STF's decision-making model is not a court decision (per curiam), but rather that of individual fractional decisions".

The figure of the *amicus curiae* (friend of the Court) is another important form of participation, in environmental collective actions, of environmental and scientific entities, which can contribute by clarifying the facts and bringing scientific information, significantly influencing the conviction of the State-Judge, in all instances or courts.

In view of this scenario, it can be seen that ecological judicial governance can pursue the following objectives:

a) Promotion of sustainability: which seeks to integrate the values of sustainability into the actions of the Judiciary, through practices that seek efficient management of resources, waste reduction and use of clean energy.

b) Guarantee of an ecologically balanced environment: aims to ensure the right to a balanced environment, provided for in article 225 of the Federal Constitution, is effectively fulfilled and that environmental protection is guaranteed and prioritized in legal proceedings.

c) Proactive role of the Judiciary: which ensures the application of the law, as well as the search for the construction of a culture of sustainability, with the training of magistrates and the promotion of the participation of society in the search for socio-environmental solutions.

d) Implementation of internal Sustainability policies: through sustainable logistics plans (PLS), with the creation of management committees and the adoption of practices such as the replacement of disposables and the conscious use of office and printing materials in the courts.

e) Initiatives and Programs: some practices, such as the National Pact of the Judiciary for Sustainability and the emergence of the Sustainability Network of the Judiciary, aim to integrate and articulate actions of the courts in the search for sustainable postures.

In view of all these statements, it can be seen that the Judiciary has a fundamental role in protecting the environment, whether to guarantee the right to an ecologically balanced environment, or to combat crimes and practices harmful to the environment. Its work involves, therefore, making use of interpretation instruments, aiming to apply environmental legislation, to protect ecosystems and affected communities, as well as to promote climate justice, with the strengthening of environmental jurisdiction, through guidelines and technical support instruments, in addition to encouraging popular participation, in order to consolidate democratic processes, in the search for the construction of a new paradigm for the construction of environmental justice.

4 ENVIRONMENTAL DAMAGE IN THE COURTS

Many environmental damages are difficult and deferred cognition. Its effects take years to appear, being incompatible with the system of statutes of limitations: 3 or 5 years.

Therefore, only the admission of the imprescriptibility of the damage would ensure the useful result, the restoration and reparation of the damage. In this regard, the Superior Court of Justice, as well as the Federal Supreme Court, consolidated the understanding that environmental damage is not subject to statute of limitations. This, by the way, was already the position of Justice Herman Benjamin, of the Superior Court of Justice, in 2007, in Special Appeal No. 948.921 - SP (2005/0008476-9):

> There is no acquired right to pollute or degrade the environment. Time is incapable of curing environmental illegalities of a permanent nature, because part of the subjects under tutelage – future generations – lacks a voice and representatives who speak or omit themselves on their behalf. Decades of illicit use of rural property do not give safe conduct to the owner or squatter for the continuation of prohibited acts or make legal practices prohibited by the legislator, especially in the context of inalienable rights, which benefit everyone, including future generations, as is the case of the protection of the environment.

Thus, in 2009, the judgment of Special Appeal No. 1,120,117-AC of the Superior Court of Justice (STJ), reported by Justice Eliana Calmon, established the understanding that the right to compensation for environmental damage is not subject to statute of limitations, as an instrument for full reparation of environmental damage and protection of interests exposed to large-scale effects – a principle of long-term liability.

The aforementioned understanding is also an instrument of reinforcement, in the face of the harmful consequences of irreversible states, with present aggravations, especially when cultural, landscape, historical and ecological values are involved. In addition, the Superior Court of Justice has also recognized the characterization of collective environmental off-balance sheet or moral damage in a gradual evolution of its jurisprudence.

However, it is extremely important to highlight that the interpretation of environmental protection is based on the analysis of the environmental good, which is presented as a fundamental right, based on the reading of the concept placed in the expression "everyone has the right to an ecologically balanced environment", contained in article 225 "caput" of the CF/88. With this, there is no longer any doubt that this expression of environmental protection is closely linked to the survival of all human beings and all living beings that inhabit the planet.

In this sense, Herman Benjamin (1998, p. 12) points out that:

> First of all, the protected legal good is part of the category of those fundamental values of our society. With the protection of the environment, we safeguard not only life in its various dimensions (individual, collective and even future generations) but the very foundations of life, the planetary support that enables the existence of the integrality of living beings. The meaning of the Brazilian constitutional norm is not different when it characterizes the ecologically balanced environment as an essential good for a healthy quality of life.

Thus, the environment elevated to the category of fundamental right of the human being translates the need to ensure the dignity of the human person, solidarity and legal security, in order to guarantee a healthy quality of life for present and future generations.

In this regard, Kiss (2004, p. 8) explains that with regard to the "right of future generations, it is accepted that it includes economic, social, cultural rights and the conservation of biological diversity, necessary to ensure its realization". It also adds that these rights of future generations "can, at least in principle, be implemented by Cortes and by independent national bodies". (KISS, 2004, p. 10).

Furthermore, this issue was dealt with by the Federal Supreme Court, in Writ of Mandamus No. 22,164 of São Paulo, rapporteur Justice Celso de Mello, judged on 10.30.1995, involving the expropriation of rural property for the purpose of agrarian reform, with the following observation:

> THE QUESTION OF THE RIGHT TO AN ECOLOGICALLY BALANCED ENVIRONMENT – THIRD GENERATION RIGHT – PRINCIPLE OF SOLIDARITY - The right to the integrity of the environment - typical third generation right - constitutes a legal prerogative of collective ownership, reflecting, within the process of affirmation of human rights, the significant expression of a power attributed, not to the individual

> identified in his singularity, but in a truly broader sense, to the social collectivity itself. While first-generation rights (civil and political) – which comprise classical, negative or formal freedoms – emphasize the principle of freedom, and second-generation rights (economic, social and cultural rights) – which are identified with positive, real or concrete freedoms – emphasize the principle of equality, third-generation rights, which materialize powers of collective ownership generically attributed to all social formations, enshrine the principle of solidarity and constitute an important moment in the process of development, expansion and recognition of human rights, characterized, as inalienable fundamental values, by the note of an essential inexhaustibility

This interpretation of Environmental Law as the bearer of fundamental rights also brings with it the search for the guarantee of a dignified life that must be ensured to all by the State. In this sense, Vidal de Souza (2021, p. 33) explains that

> "(...) the concept of balanced environment expressed in article 225, "caput", of the FC/88, should be read together with article 1, III of the FC/88, in order to provide everyone with a dignified life, with the maintenance of natural ecosystems and the protection of ecological processes, for present and future generations". In this way, the environment, a good for the common use of the people in a broad sense (material and immaterial), is guaranteed a fundamental right. This aspect also highlights and differentiates the environmental good, which is diffuse, transindividual, intragenerational, intergenerational, unavailable, inalienable, imprescriptible in relation to its repair and essential to a healthy quality of life".

Therefore, it is clear that the environment is the object of a fundamental right or, in the broadest sense of the interpretation, of human rights, a fact that expands the protection of environmental goods. Thus, based on this understanding, the STJ has used the following principles to guide its judgments:

a) Polluter pays principle: strict liability, regardless of fault or willful misconduct;
b) Principle of full reparation: which involves material and moral damages;
c) Principle of *in dubio pro natura*: in matters of environmental damage, the burden of proof is reversed to the perpetrator, and if there is doubt, a decision is made in favor of the natural environment.

In addition, since 2006, the Superior Court of Justice has established the understanding that the obligation to do, not to do and to indemnify are cumulative. Thus, one can have, as an example, an obligation to do: reforest the area deforested by the transnational agribusiness company, cumulated with an obligation not to do: not to proceed with new deforestation, in addition to the obligation to indemnify, consisting of paying the amount of money for the damage caused.

The jurisprudential evolution of the Superior Court of Justice on the subject can be appreciated by the summaries collected herein:

(...) Public civil action. Environmental damage. Condemnation of **non-patrimonial damage or collective moral damage**. Possibility. Principle *in dubio pro natura*. (...) 2. The Second Panel recently ruled that, even if reflexively, **the degradation of the environment gives rise to collective moral damage**. 3. There would be legal nonsense in the admission of compensation for injury to individual moral damage without being able to give the community the same treatment, after all, **if the honor of each of the individuals in this same group is affected, the damages are subject to compensation**. 4. Environmental standards must meet the social purposes for which they are intended, that is, interpretation and integration must be necessary in accordance with the hermeneutic principle ***in dubio pro natura***. (...) (REsp 1.367.923-RJ) (emphasis added).

(...) Public civil action. Deforestation of native vegetation (cerrado) without authorization from the environmental authority. Damage caused to biota. (...) **Principles of integral reparation, polluter-pays and user-pays. Possibility of cumulation of obligation to do (repair of the degraded area) and to pay a certain amount (indemnity).** Reduction ad pristinum statum. Intermediate, residual and collective moral environmental damage. Article 5 of the Law of Introduction to the Civil Code. In ***dubio pro natura interpretation*** of the environmental norm. (REsp 1.198.727-MG)

The refusal to apply or partially apply the principles of the polluter pays and reparation *in integrum* risks projecting, morally and socially, the harmful impression that the environmental offense pays off. Hence, the administrative and judicial response is nothing more than an acceptable and manageable "risk or cost of the business", resulting in the weakening of the dissuasive character of legal protection, a true stimulus for others, inspired by the example of impunity in fact, even if not in law, of the awarded offender, to imitate or repeat his deleterious behavior. (REsp 1.198.727-MG) (emphasis added).

(...) Public civil action. Deforestation in a permanent preservation area (riparian forest). Damage caused to the environment. Cerrado biome. (...) Principles of the polluter pays and full reparation. Reductio ad pristinum statum. Function of special and general prevention of civil liability. **Accumulation of obligation to do (restoration of the degraded area) and to pay a certain amount (indemnity).** Possibility. Remaining or reflex environmental damage. Article 5 of the Law of Introduction to the Rules of Brazilian Law. Interpretation ***in dubio pro natura*** (...). (REsp 1.145.083-MG) (emphasis added).

It should be noted that the duties of **environmental compensation and recovery are not "penalties", but compensatory measures of a civil nature** that seek, simultaneously and complementarily, the restoration of the *status quo ante* of the affected biota and the reversion to the community of the economic benefits obtained from the illegal and individual use of goods that, under the terms of article 225 of the Constitution, it is "for the common use of the people" (STJ, 2012b). (emphasis added).

Environmental reparation must be carried out as completely as possible, so that the condemnation to recover the injured area does not exclude the duty to compensate, especially for the damage that remains between its occurrence and the full restoration of the affected environment (= interim or intermediate damage), as well as for collective moral damage and residual damage (= environmental degradation that remains, despite all restoration efforts) (STJ, 2012b). (REsp 1.180.078-MG) (emphasis added).

By analyzing these summaries, it can be observed that the Superior Court of Justice recognizes that it is possible to condemn extra-patrimonial damage, such as collective moral damage. This is because the community must be given the same treatment as the individual, who is subject to compensation for moral damage.

In this sense, if the honor of each of the individuals in the group or community is violated, the damages are subject to collective compensation.

In fact, in cases of illegal deforestation, without the proper authorization of the competent bodies, the Superior Court of Justice understands that full reparation of the damage is appropriate: natural recovery of the degraded area, and pecuniary compensation.

This reparation *in integrum* aims to provide a pedagogical response to the offender and to society, in order to avoid the option that the environmental offense pays off, so as not to be treated as a "risk or cost of the business", within the scope of a shallow economic analysis of the Law.

The Superior Court of Justice emphasizes that natural reparation and compensation do not have the character of a penalty, but of compensation of a civil nature, in order to recover the destroyed biome to its situation prior to the damage, and to revert to the community those economic benefits conquered at the expense of an illegal and individual use of a good for the common use of the people, according to the focus of article 225 of the Federal Constitution.

In this way, even the residual damage, that is, that environmental degradation that perseveres, in spite of the restoration measures, must be repaired, because the Superior Court of Justice understands that the environmental reparation must be in its greatest possible completeness. In this line of thinking, Vidal de Souza (2021, p. 185) explains the importance of the care that must be taken with residual risk, for the following reasons:

> The risk, in turn, starts to perpetuate environmental damage that is transmitted to future generations. In this particular, within the risk theory, we find the residual risk, that is, the surplus resulting from the occurrence of the damage. Many treat residual risk from the perspective of risk to human health, considering it practically excluded, according to the available knowledge and techniques. However, it is increasingly clear that the residual risk is the predictable risk, and the lack of attention and care to eradicate it is raising it to a condition of danger. It is from this reading that the precautionary principle emerges, which cannot be used to curb only irreversible or potentially serious situations for the environment, but must also be used to promote the anticipation of the non-occurrence of significant or serious damages, which may arise in the face of risks with considerable extent and nature, a fact that gives rise to a deeper analysis of the proportionality of the probable damages.

It is also worth remembering that the Federal Supreme Court does not disagree with the understanding regarding the imprescriptibility of environmental damage, as can be seen from the following excerpts:

> (...) **ENVIRONMENTAL DAMAGE**. REPARATION. **NON-STATUTE OF LIMITATIONS**. (...) 4. The environment must be considered the common heritage of all humanity, in order to guarantee its full protection, especially in relation to future generations. All conducts of the State Government must be directed towards full internal legislative protection and adherence to international pacts and treaties protecting this 3rd generation fundamental human right, to avoid harm to the community in the face of an allocation of a certain good (natural resource) to an individual purpose. 5. Compensation for **damage** to the environment is an inalienable fundamental right, and it is imperative to recognize the imprescriptibility with regard to the restoration of **environmental damage**. (...) Affirmation of the thesis according to which **the claim for civil reparation of environmental damage is not subject to statute of limitations**. RExt 654833 (emphasis added).

> (...) Public civil action. Irregular mining of ore. **Environmental damage**. Reimbursement to the treasury. **Imprescriptibility**. (...) 2. The Federal Supreme Court, in the judgment of RE 654.833/AC, Theme 999, Rel. Min. Alexandre de Moraes, Full Court, DJe 6.24.2020, established that **environmental damages** do not correspond to a mere civil offense, so that they enjoy special attention for the benefit of the entire community, prevailing, therefore, the constitutional principles of protection, preservation and reparation of the environment. (...) 4. Having established the thesis: The claim for reimbursement to the treasury resulting from the irregular exploitation of the Union's mineral heritage is not subject to statute of limitations, as it is inseparable from the **environmental damage** caused. RExt 1427694 RG (emphasis added).

> PRESCRIPTION. COMPENSATION FOR **DAMAGES** CAUSED BY IRREGULAR ORE EXTRACTION. UNLAWFUL ACT OF INSEPARABLE NATURES, CIVIL AND **ENVIRONMENTAL**. (...) **NON-STATUTE OF LIMITATIONS**. 1. In actions for compensation for **damages** caused to the mining assets of the Federal Government, a type of civil offense inseparable from the **environmental offense**, the statute of limitations provided for in the proviso of article 37, paragraph 5, of the Constitution applies, and what was decided in the judgment of Topic No. 666 of the summary of the General Repercussion (RE No. 669.069-RG/MG) is inapplicable. 2. Mining usurpation constitutes an unlawful act that assumes an indisputable **environmental dimension**, attracting the thesis established in the judgment of Topic No. 999 of the summary of the General Repercussion, according to which "**the claim for civil reparation of environmental damage is not subject to statute** of limitations" (RE No. 654,883-RG/AC, Rel. Min. Alexandre de Moraes, j. 20/04/2020, p. 24/06/2020). (...) RExt 1325101 AgR (emphasis added).

> PUBLIC CIVIL ACTION. IRREGULAR EXTRACTION OF MINERAL RESOURCES. CLAIM FOR REIMBURSEMENT TO THE TREASURY. **ENVIRONMENTAL DAMAGE**. **NON-STATUTE OF LIMITATIONS**. (...) The clandestine extraction of mineral resources from the riverbed (without the proper authorization of the competent public authority) causes not only **property damage**, but mainly **damage** to the environment. 2. The disorderly extraction of mineral resources has a direct impact on the ecosystem, often bringing irreversible consequences to the environment. (...) 4.

> The present case seeks compensation for **environmental damage** (by clandestine extraction of mineral resources), so that the thesis set forth in RE 654.833-RG Theme 999, in which this COURT established the thesis to the effect that "**The claim for civil reparation of environmental damage is not subject to statute** of limitations". (...) RE 1352874 AgR (emphasis added).

In view of the above, it is clear that the Federal Supreme Court considers that civil reparation for environmental damage is not subject to statute of limitations, given the unavailability of this fundamental right. It argues, therefore, that environmental damage is not a simple civil offense, as it affects the community, prevailing the constitutional principles of environmental protection, preservation and reparation.

5 THE MAIN ENVIRONMENTAL DISASTERS IN BRAZIL

After examining the principled issues involving the theme, it is clear that ecological disasters in Brazil are of different orders and can be ordered by areas. Thus, most of them are related to the following problems, listed below:

a) Deforestation and forest degradation: in the Amazon, Cerrado and Atlantic Forest, whose main driver is the removal of forest cover, which increases the vulnerability to fires, floods and soil erosion. In addition, intense practices of illegal deforestation and the use of fire to open areas and expand agriculture assert the problem.

b) Climate change: it is a phenomenon that has generated an increase in extreme events (droughts, fires, floods), reduces the resilience of ecosystems and intensifies natural disasters.

c) Burnings and fires: are responsible for Forest fires and burnings in pasture areas and agricultural residues release carbon, degrade ecosystems and affect human health.

d) Heavy rains and floods: these are phenomena directly associated with climate change, which cause floods, landslides and landslides, especially in areas with irregular or clandestine land occupation. In addition, poor urban planning, associated with poor drainage and occupation of river banks aggravate environmental impacts.

e) Disorderly urban expansion: the lack of planning of cities, combined with demographic growth and rapid urbanization, without adequate infrastructure (drainage, sanitation, waste management) increases the risk of floods, landslides and pollution of water bodies.

f) Lack of institutional management and inspection: which reveals the lack of concern and efficiency in the implementation of public policies, through irregular inspection, which generates corruption and weak institutional memory allowing predatory practices, as

well as allows the existence of gaps in environmental governance, with the absence of rapid responses to emergencies.

g) Inadequate water management and sanitation infrastructure: in the face of the lack of well-managed watersheds, adequate reservoirs and efficient drainage systems, which increase vulnerability to water disasters.

h) Water and soil pollution: it is the result of a lack of administrative management that enables the irregular dumping of sewage, industrial and agricultural waste (pesticides, fertilizers) promoting the contamination of rivers, lagoons and aquifers, as well as the accumulation of urban solid waste and inadequate management of industrial waste.

Thus, to illustrate the problem studied here, we selected the main Brazilian environmental disasters, based on the data presented by Rubens Castilho (2025):

First. *Oil spill from the oil tanker Tarik Iba Ziyad*, which occurred in Guanabara Bay-RJ, in March 1975. Damage caused: dumping of 6 thousand tons of crude oil from the Iranian ship, which had problems in its hull, in Guanabara Bay.

2nd. *Vale da Morte*, in the city of Cubatão-SP, 1980. Damage caused: release of toxic gases by the industries of the Cubatão petrochemical complex both in the air and in the rivers of the region, generating a very high level of pollution, which caused serious health problems, causing deaths from respiratory diseases, as well as births of anencephalic children. This situation led the UN to declare Cubatão as the most polluted city in the world.

Third. *Fire in the village of Socó*, in the city of Cubatão-SP, on February 24, 1984. Damage caused: leakage of 700 thousand liters of gasoline by Petrobras, causing the death of 93 people.

4th. *Accident with Cesium-137*, occurred in the city of Goiânia, on September 13, 1987. Damage caused: rupture of an abandoned radiotherapy equipment, belonging to the Goiano Institute of Radiotherapy. The violation of the equipment allowed 19.26 g of 137Cs to be spread in the environment, in several fragments, causing the death of 4 people. This is considered the largest radiological accident in the world.

5th. *Oil spill in Guanabara Bay-RJ,* which occurred on January 18, 2000. Damage caused: leakage of 1.3 million liters of fuel oil, as a result of the rupture of a pipeline that connects the Duque de Caxias Refinery (REDUC), operated by Petrobras, with the Ilha d'Água Terminal, on Ilha do Governador.

6th. *Oil spill on the Barigui and Iguaçu Rivers*, which occurred in the metropolitan region of Curitiba-PR, on July 16, 2000: Damage caused: Spill of 4 million liters of oil (more than 25 thousand barrels), belonging to Petrobras, which reached an area of 17.7

hectares and affected the Barigui and Iguaçu rivers, as well as the groundwater of the region and caused the death of one person.

7th. *Shipwreck of the P-36 platform*, which occurred in the Campos Basin-RJ, between March 15 and 18, 2001. Damage caused: dumping 1500 tons of oil on board belonging to Petrobras, which caused explosions and the death of 11 people, as a result of failures in maintenance, design and management procedures, such as the incorrect flooding of emergency drainage tanks.

8th. *Dam rupture*, in the city of Cataguases-MG, which occurred on March 29, 2003. Damage caused: dumping of one billion and four hundred million liters of lye (leftover from the production of cellulose, *black liquor*) by the company Indústria Cataguases de Papel, in the Hydrographic Basin of Paraíba do Sul, generating fish mortality and the interruption of water supply in several municipalities in the states of Minas Gerais and Rio de Janeiro for about ten days and causing damage to small rural properties located on the banks of the Ribeirão do Tortoise, in an extension of approximately 106 hectares.

9th. *Rupture of the Bom Jardim dam*, which occurred in the city of Miraí-MG, on January 10, 2007. Damage caused: dumping of 200 thousand liters of clay and bauxite mud, by the company Rio Pomba Mineração (Bauminas Group), generating the flooding of stretches of agricultural areas, fish mortality and water shortages in neighboring Muriaé, in the city of Laje do Muriaé (RJ) and in the districts of Retiro and Comendador Venâncio, in Itaperuna (RJ).

10th. *Oil spill*, which occurred in the Campos Basin-RJ, on November 9, 2011. Damage caused: 3700 barrels of oil leak in the Frade Field, operated by the American oil company Chevron, as a result of technical failures, during the drilling of oil wells

11th. *Fire at Ultracargo*, which occurred in the city of Santos-SP, between April 2 and 10, 2015. Damage caused: fire in gasoline and ethanol tanks (60 thousand m3 of fuel -6 tanks), owned by Terminal Química de Aratu S/A, a subsidiary of Ultracargo

12th. *Rupture of the Fundão dam*, in the city of Mariana-MG, on November 5, 2015. Damage caused: dumping of 62 million m3 of iron ore tailings, in the Rio Doce basin to the mouth of Espírito Santo and the Atlantic Ocean, by the Samarco company, which caused the death of 19 people and left another 600 people homeless. This is considered the industrial disaster with the greatest environmental impact in Brazil and the largest in the world, involving tailings dams.

13th. *Rupture of the Mina do Feijão dam*, in the city of Brumadinho-MG, on January 25, 2019. Damage caused: dumping of 12 million m3 of mud and tailings, as a result of

defects in the drainage system, which generated the liquefaction of the material, with the consequent rupture of three dams owned by Vale S.A., of the Paraopeba II Complex, causing the death of 272 people.

14th. *Sinking of Braskem's Mine*, in the city of Maceió-AL, which occurred on November 30, 2023 to date. Damage caused: the intense exploitation of rock salt by the company Braskem, including the extraction of underground salt, resulted in a sinking of the soil of more than 2.16 m, which affected more than 60 thousand people and affected about 15 thousand properties, in five neighborhoods of the city (Pinheiro, Mutange, Bebedouro, Bom Parto and Farol).

The analysis of such data allows us to affirm that the issue is extremely fundamental if we look at the fight against pollution in the world.

In fact, one cannot fail to appreciate the massive investment in advertising made by large corporations, to minimize the problems caused by them in the exercise of their activities. In this regard, according to Vidal de Souza (2018, p. 178) he highlights:

> (...) as an example the two largest Brazilian companies, Petrobras and Vale. Both have compliance programs, but both are always among the biggest polluters in the country and the world. In fact, "Brazil has two companies on the list of the biggest polluters: Petrobras, in the energy sector, and Vale, in the materials sector, highlights the document by the Carbon Disclosure Project (CDP), an independent organization specializing in the climate reporting of companies" (2013), that is, these companies are always in the ranking of the 50 largest polluters in the world.

Thus, in the context of accidents that occurred in Brazil, most accidents involve situations of large oil spills and spills, dam ruptures with the dumping of ore tailings, air, air and soil pollution, in addition to a radiological accident and a case of soil subsidence, resulting from intense underground rock salt exploration.

Therefore, none of these major environmental disasters involved transnational agribusiness companies, but it is a great mistake to believe that this sector is not responsible for environmental damage. In fact, the sector is far from environmentally correct and sustainable practices in the development of its activities.

Thus, if, on the one hand, the agribusiness sector plays a vital role in the Brazilian economy, on the other hand, it is clear that this economic activity lacks an adequate management system, aimed at reducing environmental impacts, which reveals itself as a series of conducts that characterize various types of pollution. Part of this behavior is the classic figure of the means of agricultural production based on monoculture, in force in Brazil for more than 500 years, which generates intense degradation of the environment.

In this way, the agribusiness sector is responsible for significant environmental damage such as intense deforestation of Brazilian biomes, including for the purpose of cattle raising, generating considerable losses of biodiversity, soil and water pollution due to excessive use of pesticides and fertilizers, in addition to soil erosion, greenhouse gas emissions, which contribute to climate change and soil salinization due to inadequate irrigation practices.

However, it is necessary to note that the Brazilian economy has always had a large participation of agribusiness. Currently, according to data from CEPEA (2025), "agribusiness may represent 29.4% of Brazil's GDP in 2025, a considerable increase compared to the 23.5% observed in 2024", which is equivalent to about 3.43 trillion reais coming from this activity. In addition, according to Canal Rural (2015), "in the last forty years, the cultivated area has grown by about 53%. Of the 851 million hectares that Brazil has, about 329.9 million are occupied by rural properties, and productivity went from 1,258 kg per hectare to 3,484 kg".

Thus, in a less attentive reading, one can be convinced that the growth numbers of the agribusiness sector are extremely encouraging, from an economic perspective. However, the issue must be expanded to verify the advance of the various environmental impacts caused by the activity of this sector. Thus, agribusiness in the country has, in various situations seeks development and immediate profit, with frequent disrespect for current environmental legislation, without worrying about the various environmental problems in the agrarian space.

Thus, it is important to note that the environmental impacts caused by agribusiness require a multifaceted and committed approach and, for this, attention should be paid to some data related to the process of the production chain of this sector.

With this, it is possible to observe the significant growth of pesticides in Brazilian crops in recent years. First, Human Rights Watch (2018, p. 29) noted an increase in the use of pesticides in Brazil, revealing the following:

> Brazil is one of the largest consumers of pesticides in the world: annual sales in the country are around US$ 10 billion. In 2014, about 1,550 thousand tons were sold to Brazilian buyers. This corresponds to about 7.5 kilograms of pesticides used per person in Brazil each year. Agribusiness in Brazil—which includes agriculture and livestock—is one of the engines of the national economy. Over the past four decades, land used for growing grain has increased by more than 60 percent and productivity has tripled. As a result, Brazil produced 238 million tons of grains in the 2016-2017 crop year.

Then, in 2019, IDEC warned that the new regulatory framework proposed by ANVISA would bring very serious changes, which could cause "significant impacts on the perception

of the risks of pesticides", increasing "the exposure of the population - which handles or consumes food that has had contact with the product - to unsafe quantities, and restricting the available information." To support this assertion, IDEC observed that:

> With the new rules, Anvisa will adopt only mortality studies to define the classification. In addition, the rule modifies the labeling of pesticides. Extremely and highly toxic products continue to have red bands on the label, while those with a moderate classification would gain a yellow band, and little toxic and unlikely to cause acute harm will have a blue and green band. In addition to the colors, the skull - signage that today indicates the toxicity of the product - will be excluded for the lowest risk categories. For these, an exclamation point and the word "care" will be adopted. Information such as "kills if ingested" and "causes severe burns" (IDEC, 2019) will also be inserted on the labels.

However, after two more years, Brazil became the country that uses the most pesticides in its crops, surpassing China and the United States combined, according to a survey by the Food and Agriculture Organization of the United Nations (FAO). In this sense, Vieira Paz and Theodoro Rezende and Augusto Gameiro (2023) present the following data:

> In 2021, consumption reached 720 thousand tons, an increase of almost four times compared to 2003, when it was 183 thousand tons. In addition, the amount consumed per hectare of cultivated area increased significantly, reaching 10.9 kg ha-1 in 2021, almost 3.5 times more than in 2003. It is important to note that Brazilian consumption exceeds by 1.57 times the consumption of the United States, the world's second largest consumer of pesticides, which registered 457 thousand tons in 2021. At the same time, Brazil is an important producer of commodities, whether for export (sugarcane, corn and soybeans) or for consumption (rice and beans). In the same period (2003 to 2021), there was an increase in the planted area and production of sugarcane, corn, and soybeans by more than 80%. In contrast, the area cultivated with rice and beans decreased in the same period. The consumption of pesticides in Brazil is predominantly associated with export commodities, including soybeans, corn and sugarcane, which together consume 76% of the total pesticides used in the country.

But that's not all, because, according to João Rosa, in 2024, Brazil broke a record in the release of pesticides and biological pesticides, when 663 products were approved, that is, an increase of 19% compared to 2023, when 555 approvals were registered. The journalist also brings up a series of alarming data on this topic, when he observes that:

> In the first two years of Lula's government, 1,218 pesticides and biological pesticides were released. In comparison, during the four years of Jair Bolsonaro's government (2019-2022), the total number of products released was 2,182. The data indicate that, in 2023, the number of pesticides and biological pesticides released dropped compared to 2022, interrupting a sequence of seven consecutive years of increase. The Brazilian Institute of the Environment and Renewable Natural Resources (Ibama) classified the pesticides released in 2024 according to the level of danger to the

> environment. The survey presents the following numbers: 12 - Highly dangerous to the environment; 278 - Very dangerous for the environment; 255 - Dangerous to the environment; 118 - Not very dangerous to the environment (JOÃO ROSA, 2024).

This information is also added to the data presented by Fernando Canzian (2025), when he highlights that Brazilian agribusiness is consuming more pesticides and fertilizers to increase soybean production, as follows:

> In the use of fertilizers for soybeans, the country is second only to the Chinese when taking into account the volume per bag. Despite the vertiginous growth of the planted area of the grain in 30 years, from 11 million hectares to 44 million, there was a drop in the total number of bags obtained with the use of these inputs. (...) In these three decades, soybean productivity registered an annual growth of 2%, it was below the increase in the planted area (5% per year), the use of pesticides (11%) and fertilizers (8%). In the last decade, the cost of inputs has risen from 30% of the gross value produced to 44%. Taking into account all crops planted in Brazil (some with more than one harvest, which increases the use of inputs), the sale of pesticides rose from 76 thousand tons to 755 thousand in three decades, an increase of 893%, well above the 96% increase in the cultivated area.

To finalize the understanding of the seriousness of the facts, it is important to take into account the data presented by Human Rights Watch (2018, p. 29-30) on the main crops, which place Brazil as a commodity producer on the global agenda:

> The main crops—soybeans, corn, and sugarcane—accounted for 61.2 percent of the value of agricultural production. One of the characteristics of the industry is cultivation on large plantations: farms with more than 1,000 hectares represent less than 1 percent of the country's farms, but cover 45 percent of all agricultural land. The introduction of mechanized farming techniques and new technologies, such as genetically modified organisms—which include glyphosate-resistant soybeans, corn, and cotton—along with the intensive use of fertilizers and pesticides, have led to productivity gains. However, agricultural expansion has also led to deforestation, especially in the Amazon and Cerrado regions of Brazil. The enormous amount of pesticides used in Brazil is driven by the expansion of large-scale monoculture agriculture. Of all pesticides sold in Brazil, about 80 percent are used in soybean, corn, cotton and sugarcane plantations. Many of the pesticides used in Brazil are highly dangerous. Of the 10 most used pesticides in Brazil in 2016, 9 are considered highly dangerous pesticides by the NGO Pesticide Action Network International. Of these 10 pesticides, 4 are not authorized for use in Europe—indicating how dangerous many of them are by some standards.

The vertiginous growth of pesticides in Brazil stems from the loosening of Brazilian legislation. One of the examples was the rule provided for in article 20 of Law No. 7,802/89 and in article 13 of Decree No. 4,704/2002, which avoided prohibiting the commercialization of organochlorines in the country, limiting themselves to promoting a reevaluation of these

products. As Leme Machado (2014, p. 743) has already warned, "with the abolition of the mandatory renewal of pesticide registration, the Administration granted a perennial safe-conduct for the product", because "the possible reassessment to be determined by federal agencies, in practice, will only occur when the damage to public health and the environment has already occurred and such damage has been reported".

Law No. 7,802/89 was eventually repealed by Law No. 14,785, of December 27, 2023, which, however, provides, in its article 4, paragraph 5, item X, that it is incumbent on the responsible bodies to "establish procedures for the registration, authorization, inclusion, reevaluation, and inspection of products". Which means that there was no change of thought in the provisions brought by the new law.

Despite all the considerations presented, it is clear that the sector still invests heavily in advertising, which aims to minimize the anti-environmental practices mentioned, giving rise to the emergence of *greenwashing*, which, in turn, minimizes the critical reading of culture and the environment, since it fails to appreciate the subjectivities involved in the theme that must be based on a method of reflection-action.

However, *greenwashing* represents a setback in discussions on environmental issues, as it reveals itself as a model that still maintains the social structures founded on a capitalist system, in which social problems, waste, exaggerated consumption, opulence, and concentration of wealth are not examined. In this sense, Vidal Souza (2017, p. 164-165) explains that:

> A current example of the demonstration of this fact is the advertising campaign carried out by Rede Globo de Televisão and which is being broadcast, entitled, "Agro: the Industry-Wealth of Brazil". This campaign aims to strengthen one of the most lucrative markets in the Brazilian economy, that is, agribusiness. With the slogan: agro is tech, agro is pop, the campaign emphasizes the wealth generated by agribusiness in recent years. However, it says nothing about the fact that the growth in pesticide use is directly associated with the increase in commodities, as warned by the Brazilian Association of Collective Health-ABRASCO (2015, p. 454) when it revealed that "the increase in the sale of pesticides was 288% (in US$) and 162% (in tons), between 2000 and 2012, soybean production grew 100%, corn 120%, sugarcane 121% and cotton 147% (in tons)", much less about the concentration of income and the situation of monoculture, such as soybeans, aimed at export, nor about the expressive number of members of the ruralist caucus who occupy the National Congress and defend the interests of corporations for the accumulation of wealth and power in the hands of a few, or the growing deforestation, the intensive use of transgenic seeds, or the conflicts and occupations of indigenous lands, or even the absence of a safe system that guarantees sovereignty, food and nutritional security, with social inclusion and environmental preservation.

After the presentation of all these data, the fallacy emerges that environmental disasters cannot be credited to the agribusiness sector. This argument is not supported, as the aforementioned sector practices a multitude of environmental conducts that, however, are not appreciated in depth by the Government and by society.

In view of the seriousness of the situation, combined with the need to further contain the spread of the indiscriminate use of pesticides and, also, due to the intense demands of civil society, in addition to the rule contained in article 54 of Law No. 14,785/2023 that determines that "the government will develop education, instruction, dissemination and clarification actions that encourage the safe and effective use of pesticides, of environmental control products and the like, with the objective of reducing any harmful effects on humans and the environment and preventing accidents resulting from their improper use", the Federal Government issued Decree No. 12,538, of June 30, 2025, which establishes the National Program for the Reduction of Pesticides, with the following guidelines and objectives:

> Art. 1 The National Program for the Reduction of Pesticides - Pronara is hereby established, within the scope of the National Policy on Agroecology and Organic Production - Pnapo, with the purpose of implementing actions that contribute to the reduction of pesticides.
>
> Art. 2 The following are Pronara guidelines:
> I- incentive to the reduction and rational use of pesticides;
> II- encouragement of sustainable agricultural practices;
> III- promotion of healthy and sustainable food systems;
> IV – promotion of food and nutritional sovereignty and security;
> V – guarantee of the human right to health, adequate and healthy food and an ecologically balanced environment; and
> VI - strengthening of health surveillance, with participation and social control.
> Art.3 The objectives of Pronara are:
> I – to seek the gradual and continuous reduction of the use of pesticides, especially those that are highly dangerous to the environment and extremely toxic to health;
> II – to expand and strengthen the production, commercialization, access and use of bioinputs;
> III- To promote the integration of the control, inspection and monitoring of pesticides in an intersectoral manner within the scope of the Union, the States, the Federal District and the Municipalities;
> IV – to promote social control in health surveillance, access to information, dissemination of knowledge about the risks of pesticides to health and the environment;
> V – to propose fiscal and financial measures to encourage the reduction of the use of pesticides, especially those that are highly dangerous to the environment and extremely toxic to health;
> VI – to propose the adoption of bioinputs;
> VII – to promote educational and informative actions for workers and populations exposed to pesticides;

VIII – to qualify professionals in the agricultural sector, Technical Assistance and Rural Extension agents and rural producers, in order to expand knowledge on techniques capable of promoting the reduction of the use of pesticides;
IX – to improve the monitoring of pesticide residues in environmental matrices, in food and in water for human consumption, ensuring the wide dissemination of the results;
X – To foster research and technological innovation aimed at organic and agroecological-based production, bioinputs, integrated pest and disease management, biodiverse production systems and other techniques and tools that contribute to the reduction of pesticides; and
XI – to contribute to the fulfillment of the obligations and commitments assumed by the country within the scope of international agreements and treaties that deal with the elimination of hazardous chemical substances and pesticides and the adoption of alternatives with less danger to health and the environment.

All this analysis of the theme under consideration needs to take into account that Environmental Law is a right that is built on a daily basis and its emergence is due to the advance of capitalism, in its attempt to consolidate itself in all corners of the planet. The limit, therefore, has been given or imposed by nature" (VIDAL SOUZA, 2021, p. 49).

In view of this picture, it can be listed that the biggest problems of pollution caused by agribusiness are the following:

a) Loss of natural vegetation: resulting from the expansion of agriculture and livestock, with deforestation and the replacement of forests and other natural ecosystems by crops and pastures.
b) Impairment of biota: with the loss of natural habitats, causing a reduction in biodiversity and, consequently, a threat to species of flora and fauna.
c) Anti-environmental agricultural and livestock practices: with excessive use of pesticides and chemical fertilizers, with consequent contamination of soils, rivers and groundwater, causing damage to human health and other living beings.
d) Generation of waste: as a result of the increasingly high agricultural and livestock production, which pollute the environment, as they generate an immense amount of waste during agricultural production in Brazil, affecting aesthetic and sanitary conditions, in view of the disposal of materials, which causes environmental contamination, such as pesticide containers and animal feces, that need to have a special destination.
e) Soil Degradation: either by the existence of soil erosion and compaction as a result of monoculture, the use of machinery and inadequate cultivation, which reduce the fertility capacity and quality of the soil, or by the process of intense salinization, which occurs through excessive irrigation, especially in regions with high evaporation, generating accumulation of salts on the soil surface, making it unproductive.

f) Problems arising from Climate Change: in particular the emission of greenhouse gases, from the burning of waste, the use of animal waste, deforestation and the activity of cultivation and pasture itself, with the high expansion of energy, due to the release of CO2, methane and nitrous oxide, which contribute to global warming, as well as the occurrence of extreme weather events, that cause droughts and intense rains, impacting food production.

g) Conflicts between land use and biodiversity: which involve the mining, agribusiness, infrastructure and conservation sectors, hindering environmental management and increasing impacts, given the absence of efficient instruments to solve such problems.

These consequences affect the environment in a chronic and sometimes invisible way, impacting the fauna, flora, human health and well-being of the population.

In view of this situation, it can be stated that, in fact, agriculture represents a fundamental activity for human survival, being responsible for the production of most of the food we consume daily.

However, it is certain that the agribusiness sector generates numerous significant environmental impacts, which affect the quality of soil, water and air, with serious consequences for the environment and for human health and other living beings, such as the loss of biodiversity, soil degradation and food contamination.

Therefore, to reduce such environmental impacts caused, there are more efficient planting practices that can be implemented in production and that contribute to reducing impacts on the environment and biodiversity, as listed below:

a) Efficient and sustainable planting techniques: which can be achieved with the adoption of techniques that emphasize the efficiency of agricultural production, such as agroecology and no-tillage, which promotes the integration of sustainable practices, through interactions and balance between the different elements of the agricultural ecosystem and environmental, social and economic aspects, aiming to ensure the production of food in a fair, healthy way and in full harmony with natural resources, through crop diversification, crop rotation and the use of cover crops, aiming to increase productivity and, at the same time, promote soil quality, with the reduction of dependence on external inputs.

b) Reduction in the use of pesticides and fertilizers: Brazil is one of the countries that leads the use of pesticides in the world, and these, in the period from 2003 to 2021, grew by more than 392%, driven by the expansion of agriculture and the high production of commodities. Therefore, reducing the use of pesticides and fertilizers is extremely important for preserving soil and water quality and reducing pollution. The

search for organic practices is necessary for biodiversity, which allows pest control, as well as promotes an increase in soil fertility in nutrients and microorganisms, which help the soil remain healthier and more productive. Such production methods, in addition to being more sustainable, guarantee food free of chemical residues, which are proven to be harmful to human health and the environment.

c) Biodiversity conservation: biodiversity plays a fundamental role in maintaining the health of agricultural ecosystems. Therefore, the preservation of natural areas on properties allows the creation of ecological corridors, as well as sustains ecosystems, providing fundamental environmental services such as water and air purification, climate regulation, pollination and soil fertility, which ensures harmonious coexistence between food production and nature conservation. Therefore, the polyculture model allows the existence of diverse ecosystems, capable of adapting to changes, as they involve the cultivation of different species in the same space, contributing to biodiversity and increasing the resistance of crops to pests and diseases.

d) Search for renewable energy sources: the current technological evolution requires agriculture to incorporate renewable energy sources, to reduce the environmental footprint of the sector. Thus, the use of biogas, solar energy systems to power agricultural equipment, and the use of wind turbines to capture energy are sustainable alternative examples that should be used to replace the traditional use of fossil fuels, especially to reduce greenhouse gas emissions and maximize agricultural operations.

e) Education and awareness: Environmental education, provided for in Law No. 9,795/99, is one of the essential components of national education and has as its main objective the construction of critical awareness and values for the conservation of the environment. It is, therefore, a continuous process, which aims at the formation of individuals aware of environmental problems, at all levels and modalities of education, both formal and non-formal, emphasizing the importance of integrating social, ecological and ethical aspects, for environmental preservation and sustainability. Thus, when turning to the analysis of agribusiness, its main concern is to reduce the environmental impacts of agriculture. Awareness, in this sense, is promoted through training programs on sustainable practices, workshops and campaigns that focus on the knowledge of sustainable agricultural practices, their benefits and the importance of environmental conservation, with the involvement of producers, consumers, the food value chain and society in general.

Despite the advances, the transition to sustainable agricultural practices still faces significant challenges. Resistance to change, lack of access to sustainable technologies, and pressure for immediate high yields are obstacles that need to be overcome.

However, the opportunities for regenerative agriculture, which not only minimizes negative impacts but also contributes to the recovery and regeneration of ecosystems, are immense. That is why it is so important to disseminate information on the subject, and the commitment to sustainable agriculture is increasingly urgent and necessary.

In summary, reducing the environmental impacts caused by agriculture requires a multifaceted and committed approach. The transition to sustainable agricultural practices, such as integrated management, biodiversity conservation, and the adoption of renewable energy sources, is not only an ethical choice, but a pressing necessity in the face of the environmental challenges we face.

6 CONCLUSION

The constitutional principle of the polluter pays allows us to sustain that transnational agribusiness companies that cause environmental damage will be punished criminally and administratively and, civilly, and must, therefore, carry out the repair *in natura* of the destroyed space.

Thus, the exposition presented demonstrated that the illegal or illicit use of environmental resources cannot contribute to business profitability, since there is no right to pollute in our legal system, upon payment of a specific amount. In addition, the polluter-pays principle acts preventively, preventing environmental damage from occurring, but also repressively, to repair the damage effected.

Therefore, every transnational company in the agribusiness sector has an obligation to invest in preventive measures to avoid environmental damage that its economic activity may cause. Furthermore, if the damage occurs, the offending company must implement full reparation actions, and the environmental damage can be compensated *in natura* or in cash.

Among the possibilities for recovering the degraded environment, natural repair is the preferred format, aiming at the restoration of the species in the degraded area.

However, if the natural way is not possible, pecuniary reparation is made, whose estimation is difficult and complex, requiring specific environmental expertise for each degraded area.

In the search for reparation of damage, there is the sedimentation of the understanding of the Federal Supreme Court (STF) of the imprescriptibility of the claim for civil reparation for environmental damage, according to the General Repercussion Theme 999.

It should be added that in view of the concept of ecological judicial governance, the Judiciary protects the environment, reviewing and correcting omissive and commissive conducts of the Executive and Legislative Branches and, for this reason, transnational companies in the agribusiness sector that damage the environment will be subject to lawsuits for reparations to be delimited by the Courts.

In the various possible disputes, arising from damage to natural resources caused by such companies, it is appropriate to reverse the burden of proof, with the aim of equalizing forces between the parties, given the great technical and economic power of these transnationals in relation to an ordinary citizen, as dictated by precedent 618 of the Superior Court of Justice (STJ). In this sense, the polluting or degrading transnational company will have the duty to prove that it has not committed the unlawful act.

As analyzed, the Superior Court of Justice, in its gradual jurisprudential evolution, began to recognize the possibility of collective environmental off-balance sheet or moral damage. In addition, the STJ also signed a peaceful understanding, as of 2006, in the sense that the obligations to do, not to do and to indemnify can be cumulated in environmental matters.

Regarding the major Brazilian environmental disasters, it was found that none of them occurred in the agribusiness sphere, but the analysis cannot be done in a hurried manner. In fact, it was evidenced that this sector is responsible for a series of environmental impacts, which are still little monitored and valued, such as: deforestation, loss of biodiversity, soil degradation and water contamination.

Thus, the agribusiness sector still favors monoculture, with intensive use of pesticides and fertilizers directly associated with the increase in commodities, in addition to high land concentration, precarious work, dependence on external factors and logistical inefficiency. Finally, the lack of adequate regulation, combined with flawed and inefficient inspection by the State, contribute to the practice of environmental damage and inequality in the sector, which still remains focused on individual profit, allowing the continuation of violence against traditional peoples

The article sought to highlight the importance of avoidability and repression of environmental damage perpetrated by transnational companies in the agribusiness sector. Thus, if the sector shows itself to be a major participant in the Brazilian economy, it is no less true that such strength needs to be demonstrated, through continuous and effective investments to prevent damage to natural resources, which are fundamental for human survival and that of other species. Therefore, it is evident that in the event of the occurrence

of the aforementioned damages, they must be severely punished and compelled to natural and pecuniary reparation.

Natural resources are essential to the continuity and maintenance of species, and their finiteness must be highlighted and considered in the use, so that depletion does not occur and an ecologically balanced and healthy environment is maintained, with a view to human dignity and the Right of Nature.

Therefore, companies in the agribusiness sector must guide their activities, adopting a new behavioral model, which enshrines and implements sustainable management practices in their production chain, in order to carefully obey the rules provided for in article 225 of the Federal Constitution, ensuring a balanced development, considering present and future generations, through the reduction of environmental impact, valuing products and transparency in actions, avoiding *greenwashing* and allowing everyone to have a healthy quality of life.

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