

**ARTICLE**

# **Companies and Sustainable Development: The Adequacy of Environmental Impact Assessment for the Management of Environmental Risks**

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**ABSTRACT**

The choice of the environmental risk management instrument to be used within the scope of corporate governance in companies is of paramount importance to avoid or mitigate the triple environmental responsibility to which they are exposed. In this sense, the following research problem arises: The Environmental Impact Assessment (EIA), an instrument of the National Environment Policy and a model of environmental risk management adopted by some companies, proves to be efficient, effective and effective for the fulfillment of the duty to protect the environmental balance and, therefore, for sustainable development? The present study aims to elucidate this research problem. To this end, analyzes were carried out on risk and environmental damage, from a perspective of the socio-environmental function of companies today; the need for a new posture by companies in view of the reflexes of environmental risks in business activity; and the question of the adequacy or inadequacy of the EIA as an instrument of the National Environment Policy and as a model for managing environmental risks and damages, in the pursuit of sustainable development. The method of approach used was the deductive one, and the research was carried out using the method of bibliographic procedure, through which research was carried out on books, scientific articles and legislation. The result points out the inefficiency and ineffectiveness of the EIA for the management of environmental risks and, thus, for the fulfillment of the duty to protect the environmental balance by companies.

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## 1. Introduction

In Brazil, with the promulgation of the 1988 Federal Constitution, the protection of the environmental balance reached the status of constitutional duty of the Public Power and of the community, with the purpose of guaranteeing the fundamental right of present and future generations to live a quality life in an ecologically balanced environment, as provided for in Article 225, *caput*, of the 1988 Federal Constitution. Faced with the duty to protect the environmental balance, companies came to be understood as an instrument for the achievement of that constitutional purpose.

In order to comply with the constitutional duty to protect the environmental balance, companies must use environmental risk management instruments to avoid or at least mitigate environmental risks arising from their production processes, also aiming to avoid other types of risks inherent to the practice of economic activity, such as right risks and reputational risks.

Thus, the choice of the environmental risk management instrument to be used within the scope of corporate governance in companies, is of paramount importance to avoid or mitigate the triple environmental responsibility to which they are exposed. This is where the problem arises, in Brazil as Law No. 6,938/81 - Law on National Environmental Policy - provides for Environmental Impact Assessment (EIA) as one of its instruments, encouraging companies to use it as an instrument for managing environmental risks. But does the EIA give efficiency, effectiveness and effectiveness to the environmental risk management process of companies, in order to guarantee the fulfillment of the duty to protect the environmental balance and, as a consequence, guarantee sustainable development?

This is the research problem that we aim to clarify with the present study, which, once completed, can provide managers with subsidies about the choice and use of EIA as an instrument of environmental risk management in companies.

This research problem is justified, as countries such as Canada, the Czech Republic, Denmark, Hong Kong, the Netherlands, New Zealand, Portugal, Slovenia, South Africa, Sweden, the United Kingdom and the United States have already adopted, to a lesser or greater extent, the Strategic Environmental Assessment (SEA) for environmental management in their territories, thus considering the potential impacts, including cumulative and synergistic impacts; carrying out a better consideration of the alternatives; increasing accountability and efficiency in strategic decision-making; and involving

stakeholders for more transparency and better governance.

Thus, the justification for conducting the research is the fact that, if the EIA proves to be inefficient and ineffective for the management of environmental risks, the companies that may be using it as an instrument of environmental risk management will be too exposed to the triple responsibility environmental impact, which may impact your financial and image health.

Adopting the deductive approach method, having as a parameter the Brazilian case of environmental management based on the EIA method, we sought to carry out, through a bibliographic procedure, a bibliographic review in order to seek answers to the research problem.

Thus, initially an analysis was carried out on environmental risks and damages, under the socio-environmental function of companies today. Then, investigate the need for a new attitude of companies in the face of the consequences of environmental risks in business activity. Subsequently, the question of policy and damage of the search or the adequacy of the instrument of the national environment of risk management and environmental damage.

To obtain the results desired by the research, the method of approach followed, as said, was the deductive, and the method of procedure was the bibliographic, legislative and jurisprudential research, having as a background a reference system based on Law and Economics, whose exponent is Richard Allen Posner.

In conclusion, it is expected that companies can better delimit the environmental risks of their production processes and, with this, can reduce the occurrence of environmental damages or, at least, mitigate the effects resulting from them, reducing, as a consequence, the risk of their liability environment, through the election and adoption of an environmental management process that allows, from the beginning of the decision-making process, the adequate treatment of environmental issues involved in its most varied production processes.

## 2. Literature Review

### 2.1 Environmental Risk and Damage: An Analysis from the Perspective of the Socio-environmental Function of Companies Today

The notion of risk is linked to the probability of occurrence of an event or hazardous exposure, which may have a harmful result <sup>[1]</sup>. For Frade, “the concept of risk privileged by risk theories refers to the probability of the occurrence of harmful, adverse effects” <sup>[2]</sup>. Therefore, the risk can be understood as the probability of the occurrence of a dangerous event or exposure, which can generate a

harmful result.

Risks that cannot be easily related to or attributed to human actions are called natural risks. Among the natural risks, the following types of risks can be mentioned: climatic risks, arising from the climate; tectonic and magmatic risks related to earthquakes, tidal waves, tsunamis and volcanic eruptions; geomorphological risks, related to erosion processes, such as the formation of gullies and gullies, mass movements, such as landslides and landslides, as well as wind erosion and the thawing of high snow; and hydrological risks related to floods<sup>[3]</sup>.

Technological risk is that related to the *lato sensu*, productive process that covers all factors of production, work and condition of human existence. Thus, the greater the human consumption, the greater the production, which will result in an increase in hours worked, increasing the employment of equipment and people, as well as the demand for environmental resources (raw material) to obtain finished products, leading to the appearance technological risk, typical of the Risk Society<sup>[4]</sup>.

Environmental risk can be understood as one that encompasses other risks, since all risk situations are linked to what happens around them, that is, they are linked to the environment in a broad sense, be it natural, artificial, labor or cultural. Thus, environmental risk can be understood as a combination of the probability of the occurrence of a dangerous event or exposure with the severity of the environmental damage that can be caused by such a dangerous event or exposure. It is important to note that risk is a social object, as there is no risk without someone who perceives it and is exposed to its effects. In this sense, Veyret states that “[...] risk is the translation of a threat, of a danger for those who are subject to it and perceive it as such”<sup>[5]</sup> (my own translation).

On the other hand, damage is understood as the loss suffered by the victim, which is characterized by a decrease in the victim’s legal or patrimonial asset, against his will, as a result of a certain harmful event. Therefore, the damage can be understood as a negative change in the legal, material or moral situation, caused to someone by a third party who is obliged to be compensated<sup>[6]</sup>.

Risk and damage are indispensable assumptions for the configuration of liability in the environmental criminal and administrative scope, however, for the configuration of liability in the environmental civil scope (obligation to repair the damage), only the damage appears as an assumptions for the configuration of liability in the environmental criminal and administrative scope, however, for the configuration of liability in the environmental civil scope (obligation to repair the damage), only the damage appears as an

assumption, because without proof of damage, no one can be held civilly liable<sup>[7]</sup>. Thus, for the configuration of environmental civil liability, the occurrence of damage to the environment is indispensable, whereas for the configuration of environmental criminal and administrative liability, in most cases, the existence of a risk of damage is sufficient.

The legal definition of the environment is contained in article 3, item I, of Law No. 6,938/1981, which defines it as being the “[...] set of conditions, laws, influences and interactions of a physical, chemical and biological nature, which allows, shelters and governs life in all its forms ” (my own translation). Article 3, item II, of Law No. 6,938/1981, defines environmental degradation as being “[...] the adverse change in the characteristics of the environment” (Brazil, 1981, my own translation). In turn, Article 3, item III, of Law No. 6,938/1981, defines pollution as being:

*[...] the degradation of environmental quality resulting from activities that directly or indirectly:*

*a) harm the health, safety and well-being of the population;*

*b) create adverse conditions for social and economic activities;*

*c) adversely affect the biota;*

*d) affect the aesthetic or sanitary conditions of the environment;*

*e) launch materials or energy that do not comply with the established environmental standards; [...]*<sup>[8]</sup>

*(my own translation)*

The aforementioned legal provisions indicate that the environmental damage is a direct result of the adverse alteration of the environment, caused by natural phenomena or by human actions, which directly affects man in his health, safety and well-being; creates adverse conditions to social and economic activities; and it adversely affects the biota and the aesthetic and sanitary conditions of the environment.

Fiorillo defends the concept of damage as being an injury to a legal asset, even though this injury is not the result of an illegal act<sup>[9]</sup>. Thus, if there is an injury to an environmental asset, a legal asset of a diffuse nature<sup>[10]</sup>, it would be an environmental damage. For Milaré “[...] environmental damage is the damage to environmental resources, with consequent (sic) degradation-adverse change or in pejus - of ecological balance and quality of life”<sup>[11]</sup>. Therefore, environmental damage can be understood as any injury or negative change in the environment that occurs due to a natural event or a lawful or illicit anthropic action, which directly affects human beings in their health, safety, social and economic

activities.

Environmental damage has characteristics that denote the seriousness of its occurrence to society, such as the pulverization of victims, due to its cross-border effects; the difficulty of repair; and the difficulty of valuation. Transboundary effects can be understood as the effects resulting from environmental damage occurring in the jurisdictional area of a State, which move to the jurisdictional area of another State, whether or not passing through an area of international jurisdiction, provided that the effects of environmental damage occurred will affect at least two states. The Basel Convention on the control of transboundary movements of hazardous waste and its deposit, ratified by the Brazilian Government through Decree No. 875, of July 19, 1993, provides in its Art. 2, number 3, that: “Transboundary Movement” means any movement of hazardous wastes or other wastes from an area under the national jurisdiction of a State to or through an area under the national jurisdiction of another State or to or through an area not covered by national jurisdiction of any state, as long as the movement affects at least two states [...]”<sup>[12]</sup>.

Regarding the spraying of victims, it must be considered that, due to the diffuse nature of the environmental good, any damage caused to it will necessarily result in a diffuse collective of victims. Environmental damage is considered difficult to repair due to the fact that human beings, in most cases, are unable to restore the environment to the situation as nature created it. Due to the difficulty of repairing the environmental damage, it is not always possible to calculate the value for its repair, hence its characteristic of difficult valuation.

Thus, environmental damage can be conceptualized as any injury or negative change in the environment, which occurs due to lawful or illicit anthropic action, or even a natural event, which directly affects human beings in their health, safety, social activities and economic and for which he is responsible, directly or indirectly, natural or legal person, public or private, who is obliged to repair in its broadest possible sense.

The Western economy model, highly guided by the predatory exploitation of environmental resources, was aggravated by industrial development, which subjugated nature, making it a prerequisite for consumption and the market, of the way of life in the industrial system. Over time, humanity has learned, through the accumulation of knowledge, to defend itself against threats from external nature. However, it is practically defenseless against threats of an internal nature, which, absorbed by the industrial system, generates dangers in proportion to daily consumption.

Thus, they represent the “bankruptcy of modernity, emerging from a postmodern period, as the threats produced throughout industrial society begin to take shape”<sup>[13]</sup>.

In today’s society, in the face of patent environmental risks, the logic of risk production dominates the logic of wealth production in industrial society, having, as a theoretical and practical basis, the threats to life, provided by risks, considerably enhanced by the modernization of production, which do not respect borders, revealing themselves as global threats. Then, the paradigm of today’s society emerges, based on the following question: How to avoid, isolate, control, minimize and socialize threats and risks co-produced today, without compromising the modernization process and without breaking the boundaries of the socially just, the environmentally balanced, the economically viable and the politically correct?

To answer such a question, prefacially, it is necessary to differentiate personal or individual risk from global risk. The first has the possibility of reaching a single person, due to its boldness or spirit of adventure, the second translates into the possibility of impacting the existence of life on Earth, and may even extinguish it.

Environmental risk is embodied in global risk due to its cross-border characteristic, in which an environmental damage that occurs in one place on the planet ends up impacting a society located in another place, sometimes thousands of kilometers away.

The expansion of environmental risks in today’s society, due to its neglect or mismanagement, leads to the emergence of new challenges for democracy. Environmental risks represent not only risks to the environment, but also to a society’s economy, culture and politics. Therefore, such risks come to occupy a prominent place in social, environmental, political and economic issues worldwide, with regard to the distribution of environmental risks, together with the internalization of wealth by companies, both arising from highly industrialized and globalized production processes.

The risks indicate something to be avoided, so, in view of the socialization of environmental risks, companies and scientific and professional groups should be Concerned with managing the positive and negative externalities of their productive activities, they are targets of public criticism, which can lead them, if they do not manage their externalities, to reduce sales and market losses.

## **2.2 Environmental Risk and Its Reflections in Business Activity: The Need for a New Posture**

As seen, environmental risk presents itself with



the simple idea of the possibility of the future event of an event harmful to the environment, through the development of a given activity. Risk management is an important way for companies to avoid problems arising from environmental risks, especially direct risks and reputational risks. Direct risks are linked to environmental problems generated by the production processes developed by the companies and can have serious impacts on their debt settlement capacity, in view of their potential to generate environmental liability, with certainty of responsibility for repairing environmental damage caused by part of companies<sup>[14]</sup>. Reputation risks are related to negative public opinion about companies that do not comply with technical and legal rules, generating environmental damage. These risks have an impact on the reputation of companies in relation to society, and may damage their image, which is part of their assets and important for the full development of their activities<sup>[15]</sup>.

Companies are increasingly exposed to reputational risks in their daily lives. An example of this is the reputation risks arising from the occurrence of environmental damage. The corporate name and reputation, built over decades, may collapse due to the lack of capacity of executives, directors or even operational staff to react adequately in the face of environmental damage resulting from the business production process. The lack of capacity to react, in most cases, is linked to the absence of policies, plans and programs capable of preventing environmental damage or, when it occurs, controlling and reversing its harmful effects.

Environmental risks are closely related to financial risks, since the occurrence of environmental damage can reduce the productive capacity of an economic activity or even interrupt it, a fact that can reflect on the financial health of companies, leading them to default on their commitments, either in the settlement of debts, or in compliance with the measures to mitigate environmental damage assumed at the time of environmental licensing. In the first case, financial risk is present in the possibility of reclassification of credits to the list of bank assets with lesser appreciation, in view of the difficulties in receiving them. In the second case, the financial risk is present in the legal possibility of companies having to bear the compliance with the measures to mitigate environmental damage, due to the objective, integral and solidary environmental civil liability. In addition, there is also a negative repercussion of the image of companies with society, reflecting financial risk to the extent that it may result in a reduction in the number of customers or, at least, in greater difficulty in attracting new customers.

Regardless of the possibility of eventually being held

responsible for environmental damage caused by one of their production processes, companies must align themselves with contractual and environmental principles in the formulation of their institutional arrangement, due to the obligation to keep objective good faith<sup>[16]</sup> in all the phases of its production and distribution processes, including the pre and post-production and distribution processes.

In this context, direct risk and reputation risk can be minimized through sustainable practices to be developed in a transversal and multidisciplinary way, as per the environmental principles of ubiquity and cooperation<sup>[17]</sup>, covering all sectors and activities of companies, which must cooperate with each other so that, in addition to guaranteeing a sustainable performance of its internal public, they also guarantee a sustainable performance of the external public, mainly of its customers, through the internalization of environmental risks to the costs of its production processes, as recommended by the principles of polluter pays, prevention and precaution.

The risk to the existence of life on the planet is so serious that it requires thinking and acting across the many professional areas<sup>[18]</sup>. Scientific knowledge, incapable of meeting the existing demands in the risk society, must give way to other qualities of information and knowledge capable of guiding the decision-making processes with regard to doing or not doing, in the face of incomprehensible or unknown risks<sup>[19]</sup>.

The environmental issue can no longer be the object of analysis only in the natural sciences, but, due to the multiplicity of aspects that involve it, it must be treated in a transversal way, being analyzed from different perspectives, by different professionals, such as, for example, biologists, chemists, urban planners, doctors, sociologists, administrators, engineers from the most diverse branches, psychologists, agronomists, educators, economists and lawyers, among others.

Environmental risks have generated a market demand that departs from the liberal model of development, characterized by the internalization of profits and the socialization of negative externalities, among them environmental risks, and is closer to the development model, characterized by the internalization of profits and negative externalities, under the guidance of the polluter pays environmental principles, prevention and precaution, previously discussed.

In this regard, the market no longer admits purely polluting companies, which do not fit into a sustainable development model, because of this, the incorporation of the environmental variable in the decision-making process of companies is a measure imposed by the market. In this

sense, managers and economists have allied themselves with professionals from the most diverse areas, in the search for a management model that promotes not only economic growth, detached from issues of social, cultural and environmental development, but also economic development that, oriented by economic, social and environmental principles orienting the internalization, by companies, of profits and negative externalities, including environmental risks, in the search for the longed for sustainable development<sup>[20]</sup>.

The choice of the environmental risk management instrument is of paramount importance for the prevention and mitigation of environmental risks and damages and, as a consequence, for the mitigation of the triple environmental responsibility of companies. It is the structuring of institutional arrangements - governance mode - that allow the positive study of company strategies, reflected in the elaboration of institutional policies, plans and programs, which characterize them as an intelligent nexus of contractual and non-contractual relations.

In this context, with the Environmental Impact Assessment being the model of environmental risk management chosen by Brazil, as it appears in Art. 9, item III, of Law No. 6,938/1981, as an instrument of the National Environmental Policy Environment, the verification of its efficiency, efficacy and effectiveness is of great importance for the achievement of the desired sustainable development.

### **2.3 The [in] Adequacy of the Environmental Impact Assessment as an Instrument of the National Environmental Policy and as an Environmental Risk and Damage Management Model**

According to the principle of environmental impact assessment, activities that present risks of negative impacts on the environment and, therefore, in view of the principles of prevention and precaution, must be submitted to the competent environmental licensing, must be subject to Environmental Impact Assessment - EIA, in order to provide information capable of forming the conviction of the environmental authority responsible for issuing the license or authorization. The Rio de Janeiro Declaration, one of the documents resulting from the United Nations Conference on Environment and Development, Eco-92, brings the EIA as its number 17 principle<sup>[21]</sup>.

The EIA must contemplate the identification of the potential environmental problems that can be expected, the potential benefits and losses of the project and the incorporation of appropriate mitigation measures, which even include the adequate monitoring of the problems considered as critical, in order to avoid the appearance

of new ones degraded areas. The EIA has steps to be observed, and each step is intended to obtain one or more environmental licenses provided for in Art. 19, of Decree No. 99,274/90, which are the Prior License (LP), the Installation License (LI) and the Operation License (LO). During the environmental licensing phase of projects, the entrepreneur must inform the competent environmental agency about the characteristics of the enterprise that he intends to install and operate, indicating the type of activity, location, size, among other data and information that allow the environmental licensing body determine the type of environmental study to be required.

It appears that the EIA is carried out within the scope of the projects, that is, the EIA is used to verify the environmental risks contained in projects whose implementation decision had already been taken at an earlier stage, which is the planning phase, with the purpose of shaping projects to meet the legal parameters for obtaining environmental licenses and/or authorizations necessary for the installation and operation of economic enterprises. The EIA, as an instrument of environmental risk management, is restricted, exclusively, to the control of the direct impacts of projects on the environment. Thus, EIA is an instrument used in the project phase and not in the planning phase, when institutional policies, plans and programs are formulated, as well as the projects that will be executed by the company are chosen.

Thus, the EIA does not act as an instrument for the formulation or modification of policies, plans and programs aimed at mitigating environmental risks and damages, or even for the election of projects that will be carried out by companies. Such an instrument is limited to assessing the environmental risks linked to production process projects whose implementation has already been decided, that is, EIA is used to legitimize the environmental viability of projects whose implementations have already been decided at an earlier stage, whatever the stage of planning.

At EIA, the environmental feasibility assessment does not take place in the planning phase, in which the conception, election and preparation of projects occur, but in the implementation phase, that is, when the project already exists and its implementation has already been decided by the entrepreneurs, demonstrating the inability to integrate EIA into project planning, identified by Leonard Ortolano and Anne Shepherd as an "integration problem". Because it is carried out at the end of the decision cycle, in the project implementation phase, the EIA ends up being motivated by non-scientific factors. In this sense, Ortolano and Shepherd state that:

*Decisions on significant public or private devel-*

opment projects are not, in fact, made following the logic of the rational model. Instead, decisions are influenced by 'nonscientific' factors, such as agency and corporate power, and interest group politics<sup>[22]</sup>.

In this model, entrepreneurs, proponents of projects, do not give the same weight to environmental and economic objectives, as they consider irrational the use of resources to carry out EIA to inform the planning of a certain project when they do not even know about the probability of its success.

In Brazil, the EIA, carried out through the Environmental Impact Study, reveals itself as the fundamental regulatory instrument at all levels of government, an instrument that has become an administrative bureaucratic process, without adequate consideration of factors such as location, possible technological alternatives, environmental impact and potential mitigation measures<sup>[23]</sup>.

In the EIA, the steps to follow up and monitor the implementation of the projects do not occur, nor does the proper assessment of the effectiveness of the mitigation measures for negative impacts occur, which prevents the adequate and timely identification of adverse effects that have not been predicted by the environmental licensing process and, with that, it allows the continuity of projects that are causing damage to the environment without the appropriate mitigating consideration.

The EIA, as an instrument of environmental risk management, since it is not subordinated to an institutional arrangement aimed at mitigating these risks, is limited to the specific verification of the environmental risks involved in a given project, ignoring the geographical context contained, for example, in regional development plans, river basin management plans, Economic-Ecological Zoning, Environmental Audits, environmental monitoring, among others.

This statement can be exemplified by the process of degradation of the Tietê River by industrial pollution and domestic sewage in the Greater São Paulo section. Between the 1940s and the 1980s, the political permissiveness revealed in environmental licensing that did not consider the cumulative and synergistic effects of the most varied economic enterprises installed along the Tietê River, resulted in the disorderly expansion of the São Paulo industrial park, which, without due environmental counterparts, resulted in the rapid infeasibility of using the waters of the aforementioned river to supply the city, due to having reached intolerable levels of pollution, noticed through the simple olfactory perception of those who enter the municipality of São Paulo by the River Marginal Tietê.

The human being, as a rational being, seeks to

maximize his gain (well-being). To this end, it seeks to expand its source of obtaining wealth and, with that, generates a positive result and a negative result. The positive result is a function of the increase in its economic activity. So, as long as you receive all the profits from the increment, there will be a positive result. The negative result is a function of the additional overlap created by the increase in economic activity.

Thus, if the increase in economic activity makes it possible to obtain all the profits from the increase made, with the sharing of the negative effects of this increase (negative externalities) with society, the rational individual economic decision will be to increase economic activity, without worrying with the individual rational decisions of other human beings, who will also act in the same way in the most diverse economic activities, also generating positive results (profit), which will be internalized by them, and negative (negative externalities), which are socialized with the society. It was in this sense that Hardin dealt with the "The tragedy of the commons", according to him:

*The tragedy of the commons develops in this way. Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily.*

*Poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy. As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, "What is the utility to me of adding one more animal to my herd?" This utility has one negative and one positive component. 1) The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1. 2) The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsmen, the negative utility for any particular decisionmaking herdsman is only a fraction of -1. Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another... But this is the conclusion reached*

*by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit-in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all*<sup>[24]</sup>.

Each human being is contained in a system that drives him to increase his economic activity without limits - in a limited world of environmental resources. The tragedy is the destination to which all human beings are heading, each pursuing their own interest, regardless of the cumulative and synergistic effects caused by the sum of all decisions taken in isolation.

### 3. Results

Environmental risks, due to their transboundary nature, represent risks to the nature, economy, culture and politics of a society, therefore, they occupy a prominent place in discussions about social, environmental, political and economic issues worldwide, in terms of it concerns the distribution of environmental risks, together with the internalization of wealth by companies.

In this scenario, companies should be concerned with managing the positive and negative externalities of their production activities, as they are targets of public criticism, which can lead them, if they do not manage their externalities, to a reduction in their sales, due to the market losses.

For this reason, the choice of environmental risk management instrument is of paramount importance for the mitigation of the triple environmental responsibility of companies, since it will be the structuring of institutional arrangements - governance mode - that will allow the positive study of companies' strategies, enabling the reduction of environmental damage, and thus, consequently, the reduction of companies' environmental responsibility.

In the EIA, there are no follow-up and monitoring steps for the implementation of projects, nor is there a proper assessment of the effectiveness of measures to mitigate negative impacts, which prevents the proper and timely identification of adverse effects that were not foreseen by the licensing process environment and, as a result, allows the continuation of projects that are causing damage to the environment without proper mitigating consideration.

In this way, the EIA, as an environmental risk management instrument, because it is not subordinated to an institutional arrangement aimed at mitigating these risks, is limited to the specific verification of the

environmental risks involved in a given project, ignoring the geographic context contained, for example, in regional development plans, watershed management plans, Ecological-Economic Zoning, Environmental Audits, environmental monitoring, among others.

However, as reported by Law and Economics, human beings, as rational beings, seek to maximize their gain (well-being). Thus, if the increase in economic activity makes it possible to obtain all the profits from the increase made, with the sharing of the negative effects of this increase (negative externalities) with society, the rational individual economic decision will be to increase economic activity, without worrying about the decisions rational individuals of other human beings, who will also act in the same way in the most diverse economic activities, also generating positive results (profit), which will be internalized by them, and negative results (negative externalities), which are socialized with society. This is precisely what the EIA-based environmental management model provides.

### 4. Conclusions

The industrial development and unrestrained demographic growth, coupled with widespread consumption and economic globalization, has led to a dizzying increase in the production of goods and services. Consequently, there was an increase in the demand for raw materials, which caused and has been causing indiscriminate exploration and pollution of environmental resources, leading to significant changes in the environment and increasing the risk of existence for living beings that inhabit planet Earth.

Sensitive to the issue of environmental risks and their consequences on the quality of life, the Brazilian Federal Constitution of 1988 dedicated an entire chapter to the protection of the environmental balance, raising the ecologically balanced environment to the category of a fundamental right, indispensable to the existence of a quality life. Since then, companies in Brazil have had a socioenvironmental function, expressed in meeting, in an egalitarian and supportive way, the aspirations of entrepreneurs and society reflected in obtaining profit through the production and circulation of goods and services. Services, and in the circulation of wealth, in accordance with the values of free enterprise, and in compliance with the limits determined by social concerns, reflected in the valorization of human work and in the defense of the environmental balance.

Therefore, companies also came to be understood as an instrument, whose socioenvironmental function is the realization and protection of fundamental rights, aiming to



enable the existence of a life worth living, through the realization of social justice, reflecting not only the economic factor, but also social and environmental factors. In this tuning fork, environmental risk, like so many other risks that permeate companies, must be considered when developing economic activity.

Thus, the existence of an institutional arrangement composed of risk and environmental damage management instruments able to act in the incorporation of negative externalities of the productive processes, since the beginning of its planning, can make the production of companies sustainable, generating a balance of market conducive to achieving the most efficient end to be achieved, namely sustainable development and, consequently, the protection of the environmental balance, right / duty provided for in Art. 225, *caput*, of the Brazilian Federal Constitution. In this context, the choice of the instrument for managing environmental risks and damages is extremely important.

In Brazil, Law No. 6,938/81 - National Environmental Policy Law - provides for EIA as one of its instruments. As a result, companies in Brazil, more often than not, aiming to comply with the provisions of that Law, adopt EIA as an instrument for managing environmental risks. It happens that, within the scope of the EIA, the environmental feasibility study is carried out after the decision to implement the projects already conceived, elected and prepared, lending itself only to legitimize the decisions of the entrepreneurs, with regard to the implementation of new processes. Productive processes or the expansion of existing production processes. Thus, the EIA does not have a preventive character, as it has no link with the process of design, election and project elaboration, that is, at the beginning of the decision cycle, but only has a link with the process of project implementation, or that is, at the end of the decision cycle.

The lack of integration of EIA into the planning phase of the decision cycle is due to a culture of business management, whereby the environmental variable is not included as one of the necessary factors to support the decision on the viability of the design, the election, design and implementation of projects, unlike the economic variable. In such a culture of business management, entrepreneurs understand the environmental variable simply as a restriction on economic activity and, therefore, on the viability of projects, which is why they adopt the EIA, postponing the analysis of the environmental variable until after the decision to implement it of the project, only to comply with legal requirements for obtaining or renewing environmental licenses, necessary for the beginning, expansion or continuity of economic activities.

Therefore, EIA does not take into account the cumula-

tive and synergistic effects of environmental risks, represented by the sum of all environmental risks contained in the most varied economic projects existing in a state, municipality, neighborhood or river basin. With this, the EIA favors the so-called “tragedy of the commons”, removing companies from the practice of truly sustainable economic activities, a fact that increases the risk of environmental liability and, with this, increases the risk of companies’ reputation in the face of each market increasingly demanding when it comes to respect for the environment.

In this context, it is expected that Brazilian authorities and companies will adopt SEA as an environmental management model, in order to better delimit the environmental risks involved in the most varied production processes, in order to consider not only local impacts, but also but also the synergistic and cumulative impacts of the economic activities carried out, thus providing an early diagnosis of the environmental risks involved, which will be able to efficiently and effectively reduce the occurrence of environmental damage and, thus, reduce the possibility of environmental responsibility of companies.

## Conflict of Interest

The authors declare no conflict of interest.

## References

- [1] Messias, E.R., Souza, P.R.P., 2015. Financing and Environmental Damage: The civil liability of financial institutions. Rio de Janeiro: Lumen Juris Publishing Company.
- [2] Frade, C., 2009. The law face to risk. Coimbra: Critical Journal of Social Sciences. DOI: <https://doi.org/10.4000/rccs.220>
- [3] Rebelo, F., 2003. Natural hazards and human action: Studies and reflections (2nd ed.). Coimbra: University Publishing Company.
- [4] Beck, U., 2011. Risk Society: towards another modernity (2nd ed.). Saint Paul: 34 Publishing Company.
- [5] Veyret, Y., 2007. Introduction. In: Veyret, Y. (Org.). The risks: man as aggressor and victim of the environment. Saint Paul: Context Publishing Company. pp. 11-21.
- [6] Andrade, R.C., Muniz, M., 2021. Social damages – The revitalization of the civil code regarding civil liability. Saint Paul: Democratic Rights and the Modern State. <https://revistas.pucsp.br/index.php/DDEM/article/view/50109/35521>.
- [7] Wink, B.I., Bagatini, J., 2020. The civil liability of tobacco companies. Mafra: Profanations. file:///C:/Users/25461023894/Downloads/1285.pdf.

- [8] Brazil, 1981. Law n° 6.938. Brazilia: Government. [http://www.planalto.gov.br/ccivil\\_03/leis/l6938.htm](http://www.planalto.gov.br/ccivil_03/leis/l6938.htm)
- [9] Fiorillo, C.A.P., 2009. Brazilian environmental law course (10nd ed.). Saint Paul: Saraiva Publishing Company.
- [10] Boverio, P.H.F., 2021. The imprescriptibility of the repair of environmental damage from the jurisprudential point of view and the principle of prohibition of deficient protection. Curitiba: Brazilian Journal of Development. <file:///C:/Users/25461023894/Downloads/32145-82213-1-PB.pdf>.
- [11] Milaré, E., 2001. Environmental Law. Doctrine – practice – jurisprudence – glossary (2nd ed.). Saint Paul: Court Journal Publishing Company.
- [12] Brazil, 1993. Decree n° 875. Brazilia: Government. <http://www.stf.jus.br>
- [13] Leite, J.R.M., 2012. Environmental damage in the risk society. Saint Paul: Saraiva Publishing Company.
- [14] Tucci, C.E.M., Mendes, C.A., 2006. Integrated Environmental Assessment of Hydrographic Basin. Brazilia: Ministry of the Environment.
- [15] Messias, E.R., Souza, P.R.P., 2015. Financing and Environmental Damage: The civil liability of financial institutions. Rio de Janeiro: Lumen Juris Publishing Company.
- [16] Negreiros, T., 2006. Contract theory: New paradigms (2nd ed.). Rio de Janeiro: Renew Publishing Company.
- [17] Messias, E.R., 2017. Introduction to the general principles of Environmental Law (2nd ed.). Curitiba: Editora Prismas.
- [18] Souza, P.R.P., 2010. The environmental conflict of sustainable development. Law Magazine Cesumar. <https://periodicos.unicesumar.edu.br/index.php/rev-juridica/article/view/1534>
- [19] Leite, J.R.M., Ayala, P.A., 2004. Transdisciplinarity and legal-environmental protection in risk societies: Law, science and participation. In: Leite, J. R. M. & Bello Filho, N. B. (Org.). Contemporary environmental law: pp. 99-125. Barueri: Manole.
- [20] Pentinat, S.B., 2014. Analysis of the Contribution of the Sustainable Development Paradigm to Environmental, Economic and Social Justice. In: Caúla, B. Q., Martins, D. B., Mendonça, M. L. C. A. & Carmo, V. M. (Orgs.). Environmental, constitutional and international dialogue: pp. 29-81. Fortaleza: Premius1. <http://www.dialogoaci.com/publicacoes/>
- [21] United Nations Organization, 1992. Declaration of Rio de Janeiro of the United Nations Conference on the Human Environment. <http://www.onu.org.br/rio20/img/2012/01/rio92.pdf>
- [22] Ortolano, L., Shepherd, A., 1995. Environmental Impact Assessment: Challenges and opportunities. United Kingdom: Impact Assessment. DOI: <https://doi.org/10.1080/07349165.1995.9726076>
- [23] Brazilian Association of State Environmental Entities, 2013. New proposals for environmental licensing in Brazil. Brazilia: Brazilian Association of State Environmental Entities. New proposals for environmental licensing in Brazil. <http://pnla.mma.gov.br/publicacoes-diversas?download=73:-novas-propostas-para-o-licenciamento-ambiental-no-brasil&start=60>
- [24] Hardin, G., 1968. The Tragedy of the Commons. New York: Science Review. 162(3859), 1243-1248.