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The Legal Effectiveness of the National Solid Waste Policy in Brazil Regarding Recycling Activities of Civil Construction Waste

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***Abstract*—** *This research aims to analyze the situation of the National Solid Waste Policy (PNRS) with the norms and guidelines for the recycling activities of civil construction waste, established in the country through Law 12.305/2010. The solid waste recycling policy, within only a decade, has been changing, modernizing and increasingly expanding its space in construction companies. Additionally, the increase in environmental pollution and its consequences has led society to reposition itself on the subject. The excessive generation of waste and its irregular disposal in most Brazilian cities raises the questions: Have environmental protection laws and the PNRS been effective in preventing, managing and controlling the environment? One of the great challenges in choosing this topic is that we live in a society that still does not properly value recycling in its various species. Whether for cultural reasons or for lack of proper waste valuation. In this perspective, we sought to present the legal tools that guarantee development with sustainability, thus guaranteeing environmental preservation for present and future generations in accordance with the provisions of the Federal Constitution of 1988. As for its nature, this is a qualitative research, as for its objectives it is classified as exploratory and was carried out through bibliographic research, with researches carried out on specialized sites that were duly referred to at the end of this study*

I. INTRODUCTION

Law is a set of rules of conduct and the best way to understand a legal phenomenon is to understand its essential characteristics and principles.(REALE, 1995).

Life in society develops through normative instructions where people are involved in a tangle of rules that guide their actions, thus, the legal phenomenon is the representation of normative experience that guides human behavior within society. (BOBBIO, 2010).

Despite the legal norm, most of the time there is a lack of factual and social basis, in other words, there is a lack of harmony between the law and the community. Regarding this, the Law 12.305/2010 so-called National Solid Waste Policy, has in its framework the principles, objectives and

instruments to achieve the perfect management of solid waste in Brazil. (BORBA; LUZ; MARCHI, 2021).

Some authors recognize the benefits generated with proper and correct recycling in civil construction. The reduction in the consumption of non-renewable raw materials (natural resources) in substitution for properly recycled waste and the reduction of pollution in some industries that would reduce the production of carbon dioxide (JHON, 2000).

According to Szigethy and Antenor (2020) in the majority of times, the environmental impact generated by Construction and Demolition Waste – CDW – is caused by the irregular disposal of waste. Although there are technologies available within the country on the market, in order to comply with the National Solid Waste Policy (PNRS), costs and the lack of greater integration in waste management have been pointed out by experts as the reasons for this behavior. Furthermore, Freitas (2009) argues that the recycling of construction rubble appears as a viable factor for generating income or at least reducing the costs of irregular depositions.

Thus, it is clear that solid waste recycling should contribute to sustainable development, reduction of environmental impacts, cost reduction in construction sites, a heating up in the market with the emergence of new product options and development of new technologies (PRS, 2014, p.6).

Thus, it was sought to make an analysis of the situation of the PNRS regarding the regulations and guidelines that dictates the recycling activities of civil construction waste. In this perspective, the problem raised by this research is: have environmental protection laws and the National Solid Waste Policy been effective in preventing, managing and controlling the environment?

Therefore, the objective of this research is to analyze the legal effectiveness of the guidelines listed in the PNRS and the gaps in the norm and the state negligence, in relation to the recycling measures that are being taken to ensure an ecologically healthy environment.

This study was carried out through bibliographic research, has a qualitative nature, also being classified as exploratory research according to its objectives.

II. THE NATIONAL SOLID WASTE POLICY (PNRS)

The National Solid Waste Policy (PNRS) is a law (Law nº 12.305/10) that organizes the way the country deals with waste. This law demands transparency from the public and private sectors in the management of their waste (BRASIL, 2010).

According to Gouveia (2012), in recent decades, the constant increase of consumption in cities has led to a large generation of urban waste. This growth is not followed by proper disposal, which can harm the environment and human health by contaminating the soil, water bodies and the atmosphere.

A great potential is wasted as many objects could be recycled or reused saving natural and financial resources and CO2 emissions, which unbalance the greenhouse effect. (GOUVEIA, 2012), in disagreement with the objectives of the aforementioned Law in its article 7.

The Brazilian Regulatory Standard – NBR 10004/2004, classifies waste as:

> those in solid and semi-solid states, which result from industrial, domestic, commercial, agricultural, service and sweeping activities. This list also includes sludge from water treatment networks, those generated in pollution control equipment and installations, as well as a series of liquids which, if released into the public sewage system, is unfeasible their demand for technical solutions to do so are economically unfeasible in the face of the best available technology.(ABNT, 2004, p.7 apud GLORIA; RIBEIRO JUNIOR; SOUZA, 2020, s.p.; free translation).

According to the same standard, item three has defined solid and semi-solid waste as:

> [...] that result from activities of the community of origin: industrial, domestic, hospital, commercial, agricultural, services and sweeping. Included in this definition are sludge from water treatment systems, those generated in equipment and 1. Pollution control installations, as well as certain liquids whose particularities make their release into the public sewerage network or bodies of water unfeasible, which require technical solutions that are economically unfeasible in view of the best available technology (ABNT, 2004, p.8; free translation).

In Brazil, the NBR 10004 (ABNT, 2004) shows the classification of solid waste according to the potential risks to the environment that it can cause. Solid waste is thus classified into three distinct classes: Class I hazardous waste, Class II non-inert or banal waste, and Class III inert waste. According to Ramos (2010), the public power is

responsible for the proper management of urban solid waste and has been facing it as their greatest challenge. Tons of waste are disposed daily in sanitary landfills and dumps and even in river streams within large cities, which can have negative impacts on the environment.

To avoid these damages, proper treatment must be applied to this waste in order to prevent it from affecting all sectors of the economy and all citizens living near these places. The PNRS integrates public power, private initiative, and civil society and has at its core the article 7º on the objectives of the National Solid Waste Policy:

> I-Protection of public health and environmental quality;
>
> II-Non-generation, reduction, reuse, recycling and treatment of solid waste, as well as an environmentally appropriate final disposal of waste;
>
> (...)
>
> VI-Incentive to the recycling industry, focusing in encouraging the use of raw materials and inputs derived from recyclable and recycled materials;
>
> (...)
>
> XIV-Encouraging the development of environmental and business management systems aimed at improving production processes and reusing solid waste, including recovery and energy use;
>
> XV- Encouraging environmental labeling and sustainable consumption. (BRASIL, 2010. on-line; free translation)

There are a number of specific rules that deal with solid waste, however the main one is the PNRS, so all others are subject to it.

III. PROJECT OF ENVIRONMENTAL CONTROL

The National Solid Waste Policy (PNRS) determines that all companies are responsible for the destination and final disposal of their waste. Resolution No. 307/2002 of the National Council for the Environment (CONAMA), defines responsibilities and duties, making it mandatory in all municipalities in the country and in the Federal District to implement Civil Construction Waste Management Plans, by their local government, seeking to eliminate the negative environmental impacts resulting from activities related to the generation, transport and destination of these materials (ALIPIO, 2010, p.49).

According to Lira (2016), "This resolution together with the National Solid Waste Policy (PNRS)", aim to:

• Importance of applying techniques that reduce the environmental impacts generated by waste from the construction sector;

• The final disposal of waste according to a suggested classification and in specific locations according to the standard norm and licensed;

• Regarding the liability for civil construction waste arising from construction, renovation, repair, demolition, extraction, and any activity related to the sector, the generator itself becomes responsible for the waste;

• The recycling of civil construction waste and the integrated management of waste integrate an economy in the production and reuse of this junk as raw material, thus generating a gain for humanity, in the environmental, economic and social aspect. The Constitution of the Federative Republic of Brazil (CF/88), also known as the Magna Carta of the Nation, limits powers and defines rights and duties of all brazilian citizens, according to caput of the article 225 that states:

> Everyone has the right to an ecologically balanced environment, good for common use by the people and essential to a healthy quality of life, imposing on the Public Power and the community the duty to defend and preserve it for present and future generations. (BRASIL, 1988, pág. 139; free translation)

Given the importance of the environment, it is up to the government and the community to defend and preserve the environment for present and future generations. Farias (2014) states that, this integrated and responsible management between public authorities and society with regard to management is essential because everyone is closely linked to the environmental cause, being a shared responsibility among all from inspection to the control of the causes of environmental impacts caused by the incorrect management of waste. (FARIAS, 2014).

According to the Resolution CONAMA 307 from 2002, that deals with the criteria and procedures for the management of waste from civil construction, it states on Art. 2º, and as presented to us by Fernandes (2015):

> Civil construction residues: are those from construction, renovations, repairs and demolition of civil construction works, and those resulting from the preparation and excavation of land, such as: bricks, ceramic blocks, concrete in general, soils, rocks, metals , resins,

> glues, paints, wood and plywood, linings, mortar, plaster, tiles, asphalt pavement, glass, plastics, pipes, electrical wiring, etc., commonly called construction rubble, limestone or shards(FERNANDES, 2015, p.40; free translation)

According to the resolution, ideally, solid waste should not be generated and a secondary goal should seek to reduce, reuse, recycle, and take due care with the final destination of the CDW. As for Pereira e Brito (2012), the environmental control project is a grouping of rules aimed at monitoring the impact on the flora and fauna in order to correct or reduce it. According to the authors "the foundation of environmental control is through three basic principles: Licensing, supervision and monitoring" (PEREIRA & BRITO, 2012, p. 21).

IV. LEGAL EFFECTIVENESS IMPOSED ON RECYCLING ACTIVITIES

Historically, in Brazil, there is no integration between the bodies that elaborate the norms and the ones that implement them, which has been causing problems in the execution of public policies, such difficulties compromise the effectiveness of legal norms. On this matter, Borba, Luz and Marchi (2021, p. 2) make clear that:

> Normative effectiveness is the possibility of a norm to produce legal effects. Thus, given its instrumental character, the law is elaborated with a view to the elaboration of practical effects. Therefore, the effectiveness of a norm can be both legal and social. Legal effectiveness, also known as applicability, takes place when a norm has full normative resources for the production of its effects in the legal sphere. On the other hand, social efficacy, or effectiveness, occurs when a legal norm corresponds with the current reality. (BORBA; LUZ; MARCHI, 2021, p. 2; free translation)

The National Solid Waste Policy is considered a landmark in the issue of Brazilian environmental legislation since it is the precursor regarding the disposal of solid waste in the country's legislation.

According to Cabrera (2020), several laws dealt with the disposal of solid waste, however, it was only with the PNRS that the theme of environmental protection was consolidated based on new concepts of solid waste management and presenting effective mechanisms of protection proposed by environmental and constitutional legislation.

The PNRS associated with the general principles[7] of Environmental Law and the constitutional, administrative, and environmental guidelines, established principles of extreme importance to regulate all activities of public or private administration that were carried out within the law and with attention to environmental prevention and preservation.

V. THE POLLUTER PAYS PRINCIPLE

Since 1972, The Organization for Economic Co-operation and Development (OECD) had already incorporated the polluter pays principle, being reaffirmed at the 1992 Conference in Rio de Janeiro in its principle 16, as follows:

> National authorities should strive to promote the internalization of the costs of protecting the environment and the use of economic instruments, in accordance with the principle that it is the polluter who should, in principle, assume the cost of pollution, within the concern of public interest and without distorting the game of international trade and investment (OLÍMPIO, 2007, s.p.; free translation)

This principle is the initial basis of Environmental Civil Liability, thus determining that those who benefit from the environment must share the costs that go to minimize or extinguish the threat of damage. It is the so-called internalization of costs. The polluter pays principle arises supported by economic principles that sought maximum efficiency in the internalization of costs with negative consequences generated by the development of economic activities that can only be understood through Environmental Law (SOUZA, 2018).

The principle of the user-payer establishes that the user of natural resources must pay for their use. The idea is of economic value definition to the natural good in order to rationalize its use and avoid its waste. The appropriation of these resources by one or several individuals, public or private, must provide the community with the right to financial compensation for the use of natural resources, goods of common use. (CARVALHO, 2014).

This principle adopts a dynamic of valuing the acquisition of the guarantee of the right to pollute according to economic demand through credit titles that guarantee the emission of carbon into the atmosphere.

This principle alludes to the socio-environmental function of the property, going beyond its use and enjoyment and demonstrating the importance of greening the property. It seeks to avoid environmental damage, value the preservation of the environment and always observes the ecological and social balance in accordance with environmental standards.

Thus, this principle is fundamental to environmental policies since facing the non-fulfillment of preservation duties, the polluting individual will be subject to the sanctions provided for in the Brazilian legal system.

This principle cannot be confused with the strict liability of the person causing the damage, given that holding the agent responsible for the damage requires the occurrence of a causal link between the phenomenon that caused the damage and the actual occurrence, thus, it cannot be restricted solely to the economic repair of the environmental asset that was harmed.

The polluter pays is a guiding principle when it comes to civil liability, of a precautionary and preventive nature, aiming at the internalization of environmental costs and risks and whoever causes the damage must bear the cost of its repair. Furthermore, it presents itself as a guideline that identifies an agent causing the damage and a penalty for their action, consequently having them paying for the repair of the damage caused to the environment through its harmful activity.

However, the polluter is not always the one who directly causes damage to the environment. It may be the person who caused the damage in situations of illicit repair, such as in cases of legal action to repair the environmental damage, so the costs must be borne by the person who took private advantages from that damaging action.

In consonance with Erika Bechara (2020), the polluter pays principle can be divided into four dimensions that help explain and identify the application of the principle: dimension of economic rationality, social ethics, environmental policy, legal-normative. From this perspective, the foundation of this principle is the prevention of environmental damage with the intention of avoiding costs that arise from an activity that causes environmental damage.

The author says that “The polluter pays principle establishes a wide range of possibilities for reactions, without necessarily predicting a single variant or a certain pattern for its realization.”(Free translation). It is a principle that counts the costs, where the causer needs to be affected and the cost is passed on to the consumer. “The polluter pays principle is preserved when the causer deducts from the consumer the cost of his expenditure.”(Free translation).

These are the so-called negative externalities, factors that result from production and are received by the collectivity. It can be called “privatization of profits and socialization of losses”, with the application of the polluter-pays principle, the aim is to correct this cost that is added to society, where its internalization is imposed. Consequently, it is observed that the internalization of price externalities is often not fulfilled by the whole society, considering that if the rise in prices due to this phenomenon is not followed by everyone, there is a tendency for consumers to seek products that do not have this encumbrance on account of this principle, in exception the consumers who have a great ecological conscience.

The legislator's idea was to seek an equitable redistribution of environmental externalities. However, this principle is often distorted in the face of market competition and many authorities or even regulations present different costs to the agents causing environmental damage.

This principle is fundamental for the preservation of natural resources, and it is only necessary to make the proper adaptation of this marketing tool, and cannot be applied only as a mechanism for repairing the damage. The ideal would be to be applied as a prevention tool, as seeking to prevent environmental damage from occurring in order to seek repair.

Finally, despite still needing adjustments in the preventive methods, it can be said that the polluter pays principle is considered a great milestone for Environmental Law, reaffirming what is expressed in our Constitution in its article 225 that transformed the environment into a fundamental right of the present and future generations.

According to Milaré (2009), this principle is configured as the principle of responsibility in accordance with article 225 § 3, which prescribes the possibility of holding harmful agents accountable both criminally and administratively.

> The user pays principle establishes that the user of natural resources must pay for their use. The idea is to define the economic value of the natural good in order to rationalize its use and avoid its waste. The appropriation of these resources by one or several individuals, public or private, must provide the community with the right to financial compensation for the use of natural

> resources, goods of common use. (THOMÉ, 2015, p. 77; Free translation).

In consonance with Milaré (2009) the difference between the principles is on the payment by the polluter pays, which is a sanction and not a benefit. On the other hand, the user-pays, in the legal administrative act, has the freedom to enjoy natural resources with the free exercise of the activity granted by the public power.

VI. THE ENVIRONMENTAL DAMAGE

Although the Brazilian legislation did not express the concept of environmental damage, law 6,938/1981 clarifies some points that allow the understanding of its main characteristics (FREITAS, 2015). As mentioned above, environmental damage has a complex concept, given the breadth of the environment theme, diffuse and covering several aspects, it can be considered as a multidimensional and multifaceted characteristic of the environment. Despite being classified as a third generation right, it covers the first and second generation as well, thus shaped by the principle of solidarity. (ALVES; NOMURA; MANEIA, 2013).

Raising reflections regarding this topic, Antunes (2013) characterizes it as such:

> Damage is the unfair loss caused to a third party, generating an obligation to compensate. The action or omission of a third party is essential. Needless to say, the concept only includes negative changes, as there is no harm if conditions are changed for the better, without prejudice. It is the negative variation, moral or material, that should be, as far as possible, measured so that the reimbursement can be affected (ANTUNES, 2013, p. 539; Free translation).

Following this, Leite (2012) teaches that:

> Environmental damage means, in a first sense, an undesirable alteration to the set of elements called environment, such as, for example, atmospheric pollution; it would thus be an injury to the fundamental right that everyone has to enjoy and take advantage of an appropriate environment. However, in its second conceptualization, environmental damage encompasses the effects that this modification generates on people's health and interests. (LEITE, 2012, p. 92; Free translation)

Therefore, environmental damage should be understood as the injury caused to any of the environmental classifications: natural, artificial or cultural, and may also have material or moral features. As for the classification and its amplitude it can be divided between: pure ecological damage (restricted); extensive environmental damage; and individual or reflex damage (partial). Acording to Leite (2003) damage can be classified by the amplitude of the protected property and its extent.

I - Regarding its amplitude:

a) Pure Ecological Damage: Injury to the environment, damage affects essential components of the ecosystem, requiring repair in order to restore a sustainable environment. Pure ecological damage intensely affects goods of nature, in the strict sense, having no relation to the components of cultural or artificial patrimony.

b) Environmental Damage Lato Sensu (Extensive): closely linked to diffuse interests of the collectivity, embracing all components of the environment. On this matter, Leite (2003, p.94) states that extensive environmental damage:

> "[...] latu sensu, that is, concerning the diffuse interests of the community, it would encompass all components of the environment, including cultural heritage. Thus, the environment and all its components would be protected, in a unitary conception" (LEITE, 2003, p. 94)

Extensive environmental damage affects the entire environment, that is, the natural, the artificial and the work environment. In the broadest sense, harm is "all harm that someone suffers to his soul, body or property"

c) Individual Environmental Damage or Reflection: This case, reflects individual or collective interests of the injured party, but some scholars ensure the need to differentiate between the individual and the collective that would not be fully protected instantly

II – As for its extension:

a) Environmental Property Damage: Some scholars describe environmental property damage as material, one that reflects on the environmental good itself (the ecologically balanced environment). Hence, is directly related to the restitution, recovery or indemnification of the harmful environmental asset.

b) Extra-patrimonial or environmental moral damage: Popularly known as environmental moral

damage, the extra-patrimonial according to Leite (2005, p. 97) "[...] everything that concerns the sensation of pain experienced or equivalent concept in its broadest meaning or any non-patrimonial damage caused to society or the individual, due to the damage to the environment."(Free translation)

Besides the constitutional foundation, environmental moral damage is supported by Law No. 7,347/1985, through the Public Civil Action, an instrument to defend the environment and diffuse and collective rights, an action that opened the doors for the damage caused to nature to reach the Judiciary.

Law 6,938/1981 expresses in its article 14 § 1 the two types of environmental damage when referring to "damage caused to the environment and to third parties"

VII. THE CIVIL RESPONSIBILITY FOR ENVIRONMENTAL DAMAGE

According to Milaré (2011) environmental degradation "is a phenomenon that has accompanied man since the beginning of his history. Only the legal perception of this phenomenon - even as a consequence of a new legal asset called 'environment' - is recent" (MILARÉ, 2011, p.23). As previously stated, environmental damage is a presupposition of great importance for the realization of the theory of environmental civil liability, several researches sought to build this concept trying to broaden the understanding in the face of reality, researches such as Antunes (2013) and Leite (2012) sought to make the proper conceptualization. According to Antunes (2013):

> Damage is the unfair loss caused to a third party, generating an obligation to compensate. The action or omission of a third party is essential. Needless to say, the concept only includes negative changes, as there is no harm if conditions are changed for the better, without prejudice. It is the negative variation, moral or material, that should be, as far as possible, measured so that the reimbursement can be affected. (ANTUNES, 2013, p. 539; Free translation).

Legally, damage is one of the main bases of civil liability, the existence of which indicates the occurrence of injury to a legal asset, therefore any damage caused to the environment with degradation that reaches the balance of nature and the quality of life. The broad vision of the environment must consider the set of natural, artificial and cultural elements.

As for Leite (2012), the changes, in addition to being ecologically harmful, can at the same time transform the standards for survival, with interference in the health of the population and its interests. In agreement to Leite's (2012) positioning, Fiorillo (2013, p. 94) in his studies shows that "In the event of injury to an environmental asset, resulting from an activity carried out by an individual or legal entity, public or private, who is directly or indirectly responsible for the damage, not only is it characterized, but also the identification of the polluter, who will have the duty to indemnify it.". Following this idea, environmental damage is configured through action or omission, which as a presupposition causes damage in any of its forms, internal or external (ANTUNES, 2013).

According to Leite (2012), Environmental Law brings a new configuration of damage in relation to classical conceptions when it comes to environmental damage, a less individualistic view is presumed. Consequently, it is necessary to be attentive to the elements that make up the problems related to the legality between environmental and traditional damage.

Milaré (2011) brings some considerations about environmental damage, emphasizing the legal reaction called by the author "materialization of the principle of full responsibility of the degrader, which subjects him, cumulatively, to repressive and reparatory sanctions". Damage to the environment has repercussions on the legal system in three different ways: Administrative Sanction, Criminal Sanction and Civil Sanction. Appearing in these different scopes, the responsibility has its own characteristics and norms, they are independent from each other so that in the end the result of the sanctions are specific to each legal sphere. As already mentioned, the relevance of the damages that were and continue to be caused to the environment with the devastation of the Amazon rainforest, leaving aside by the authorities the scientific knowledge produced until now, are of incalculable dimensions.

Environmental civil liability is intrinsically subject to the strict liability regime, which, despite the existence of fault or negligence, imposes liability on the person causing the damage. In summary, the existence of environmental damage and a chain of causality is essential for the configuration of civil liability.

Due to the Law 9,605/98, more than 60 types of environmental crimes with different types of penalties were typified: fines, restrictions, community service and imprisonment. In the case of legal entities, suspension of activities, embargo of works or activities, among other penalties, may also occur.

Keeping in mind the duty-power of inspection, the civil liability of the State for damages caused to the environment is characterized by the omission by the Executive Power, according to the Federal Constitution of 1988 on art. 225 § 3o "whereby, if the command of the Federal Constitution contained in art. 225 is not complied with, the Public Power will respond directly and exclusively, and the competent Public Civil Action must be instituted for this purpose".

VIII. FINAL CONSIDERATIONS

According to the research carried out on recycling as an economic feasibility, it was observed that in the country there is a great concern on the part of the public authorities regarding the protection of the environment. In this context, the analysis of the National Solid Waste Policy and the CONAMA Resolutions that deal with the proper destination of the CDW.

Through the PNRS, it is clear the responsibility of companies for the destination and final disposal of waste through some resolutions of the National Council for the Environment, which made it mandatory for all entities of the federation to implement Civil Construction Waste Management Plans. Furthermore, the PNRS brings recycling as the responsibility of everyone in the production chain, thus considering the recycling process as one of the main objectives of environmental management.

This research aimed to investigate the effectiveness of environmental standards in relation to the environmental damage caused by the ineffectiveness of the management of companies in relation to the final destination of solid waste from civil construction, motivated by the great growth of this productive sector in the country.

Civil liability in Common Law resorts to subjective liability, while in the field of Environmental Law, civil liability is objective and based on the theory of integral risk, which states that whoever practices activities that may harm the environment, regardless of fault, has a duty to make reparation for the damage.

According to the literature, the fundamental objective is to repair the damage, its recomposition can be carried out in the different ways provided in Brazilian legislation. In addition to this, society finds in environmental civil action an effective instrument in protecting the environment, repressing practices of harmful acts and always seeking to repair the damage caused.

Regarding the rules and punishment, it can be observed that the Federal Constitution of 1988, on its article 225, imperatively imposes the protection of the environment, concomitant with Laws 6,938/81, 9,605/98 (ENVIRONMENTAL CRIME LAW) and also Decree no. 6514/2008 which in cases of harmful conduct guarantee penalties in the three spheres: administrative, civil and criminal.

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[26] Among the principles presented, we give special emphasis to the principles established in items II and VII, namely, the polluter pays and the protector-receiver; and the shared responsibility for the life cycle of the products, as it is understood that these are principles that offer the main and potential effectiveness to the general purposes legally established by the PNRS.