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ENVIRONMENTAL SERVICES AND ECOSYSTEM SERVICES: CONCEPTUAL DIFFERENCE AND APPLICATION IN BRAZILIAN ENVIRONMENTAL LEGISLATION

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Abstract: The concept of Ecosystem Services proposed in the 1970s gained wider discussion in the 1990s, mainly due to the increased engagement of member countries of the United Nations in building policies for sustainable dksevelopment that consider human needs and the preservation of natural resources, drawing to this end on efforts from various fields of science. Different sectors of academia, such as biology and geography, contributed to this interdisciplinary discussion with studies in the environmental area and other fields of science that do not effectively work with concepts like ecosystem and environment, and sometimes use these concepts incorrectly in their works to explain a given phenomenon. In order to contribute to the interdisciplinary discussion related to Ecosystem Services and Environmental Services, this article proposes a review of the concepts of ecosystem and environment, including the Payment for Services model, whether environmental or ecosystem, and of Brazilian federal legislation on the subject, contributing to the discussion on how these terms can be used in a more feasible way to address phenomena studied in different kinds of research.

Keywords: Ecosystem Services, Environmental Services, Legislation.

SERVIÇOS AMBIENTAIS E SERVIÇOS ECOSSISTÊMICOS: DIFERENÇA CONCEITUAL E APLICAÇÃO NA LEGISLAÇÃO AMBIENTAL BRASILEIRA

Resumo: O conceito de Serviços Ecossistêmicos, proposto na década de 1970, ganha maior amplitude de discussão durante a década de 1990, principalmente devido ao maior engajamento de países membros das Organizações das Nações Unidas em construir políticas para o

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desenvolvimento sustentável que considere as necessidades humanas e a preservação dos recursos naturais, para tanto, além de políticas, esforços de diferentes campos da ciência foram empregados. Esta discussão interdisciplinar trouxe a contribuição de diferentes setores da academia, por exemplo, Biologia e Geografia com estudos desenvolvidos na área ambiental e outros campos da ciência que não trabalham efetivamente com conceitos como Ecossistema e Ambiente, utilizam em seus trabalhos por vezes de forma errônea esses conceitos para explicar determinado fenômeno. Para tanto, com o objetivo de contribuir para a discussão interdisciplinar, onde se inserem os Serviços Ambientais e Serviços Ecossistêmicos, é proposto no presente artigo uma revisão dos conceitos de Ecossistema e Ambiente, além da estruturação dos modelos de Pagamento por Serviços, sejam eles Ambientais ou Ecossistêmicos, e a revisão da legislação federal brasileira sobre o tema, contribuindo para a discussão de utilização dos termos de maneira mais factível com os fenômenos estudados em cada pesquisa realizada.
Palavras-chave: Serviços Ecossistêmicos, Serviços Ambientais, Legislação.

SERVICIOS AMBIENTALES Y SERVICIOS ECOSISTÉMICOS: DIFERENCIAS CONCEPTUAL Y APLICACIÓN EN LA LEGISLACIÓN AMBIENTAL BRASILEÑA

Resumen: El concepto de Servicios de los Ecosistemas, propuesto en la década de 1970, gana un mayor alcance de discusión durante la década de 1990, principalmente debido al mayor compromiso de los países miembros de las Organizaciones de las Naciones Unidas en la construcción de políticas de desarrollo sostenible que tengan en cuenta las necesidades humanas y preservación de los recursos naturales, para lo cual, además de las políticas, se emplearon esfuerzos de diferentes campos de la ciencia. Esta discusión interdisciplinaria trajo el aporte de diferentes sectores de la academia, por ejemplo, Biología y Geografía con estudios desarrollados en el área ambiental y otros campos de la ciencia que no trabajan eficazmente con conceptos como Ecosistema y Medio Ambiente, que utilizan en su trabajo a veces de manera errónea. conceptos para explicar un determinado fenómeno. Por ello, con el objetivo de contribuir a la discusión interdisciplinaria, donde se insertan Servicios Ambientales y Servicios Ecosistémicos, en este artículo se propone una revisión de los conceptos de Ecosistema y Ambiente, además de la estructuración de los modelos de Pago por Servicios, sean Ambientales. o Ecosistemas, y la revisión de la legislación federal brasileña sobre el tema, contribuyendo a la discusión del uso de términos de manera más factible con los fenómenos estudiados en cada investigación realizada.

Palabras-clave: Servicios Ecosistémicos, Servicios Ambientales, Legislación.

Introduction

The society-nature relationship results in natural processes and events of different magnitudes. This relationship is dubious, as nature provides society with elements for its subsistence but receives pressures and impacts that unbalance the natural system.

With the current economic model, technological development, world population growth and population density in urban areas, the consumption of natural resources increased in the 20th century to worrying levels that triggered an unprecedented environmental crisis. The paradigm shift about the consumer society needs to be put into practice with actions where collective decisions are more important than individual decisions and of strictly economic interest (MAY, 1995).

According to Daily (1997), technological development alone will not regulate the depletion of natural resources. This requires planning that considers the development of analytical institutional structures, committed to environmental issues and the consolidation of social, economic and political security.

These actions are proposed by multilateral organizations such as the United Nations Sustainable Development Goals (SDGs). A second example is actions by national governments to institute climate policies to reduce greenhouse gas emissions.

This discussion, according to Daily (1997), starts in the 1970s, with the Study of Critical Environmental Problems listing affected services in a scenario of declining ecosystem functioning.

For example, climate regulation, soil formation, pollination and flood control, in addition to studies by Ehrlich and Holdren (1977) and Westman (1977), help to build the concept of Ecosystem Services as an ecological and economic response to ecosystem degradation and the recognition that human beings depend on nature.

Ecosystem Services seek to equate the use given to the land by the occupation model and the natural characteristics, creating mechanisms for environmental preservation with a view to the sustainability of the environment. The development process of society is the main aspect to ensure that sustainability itself has an approach that is operationalized (RODRIGUEZ and SILVA, 2013).

The value of Ecosystem Services considers as a fundamental aspect of natural resources that they provide something for consumption. For example, the genetic fund to support life; physical space for social and economic activities; regulators of ecological and environmental functions; source for cultural development. In addition to the economic sense of value, it is essential to value access, technology and culture. However, the appropriation of costs and benefits depends on the mobilization of resources (RODRIGUEZ and SILVA, 2013).

These aspects should guide environmental planning because they reflect the reality observed in an area. It is essential to link the academic discussion of ecosystem services with environmental policy. An example was the launch of the Payments for Environmental Services (PSA in the Portuguese acronym) program by the government of Costa Rica in 1997. This proposal aimed to create a new environmental planning tool to control the progress of deforestation in the country and was fundamental to bring it closer to PES, the concept of Payment for Ecosystem Services (CHAUDHARY et al., 2015; PAGIOLA et al., 2005).

The Millennium Ecosystem Assessment (MEA) published in 2005 was another important guiding document, defining Ecosystem Services as the benefits of the ecosystem, providing human well-being. From this moment on, the concept of Ecosystem Services is compared or considered synonymous with the term Environmental Services. However, in publications by international organizations the term Ecosystem Service is more widely used, and in academic publications there is no consensus on the use of both terms (CHAUDHARY et al., 2015).

Some studies emphasize the application of this theme in Latin America. Figueroa (2009) analyzed the experiences of PES applied to protected areas, identifying a wide range of mechanisms implemented to offer possibilities for financing conservation units, thus reducing their financial dependence on transfers from the government budget.

In turn, Flores Aguilar et al. (2018) present a review of environmental governance arrangements in the implementation of PES in Latin America, identifying that the state, even with the advancement of neoliberal policies, remains one of the main actors in the institution, regulation and channeling of resources to the entities involved in a PSA institution process.

In Brazil, Federal Law No. 12,114 / 2009 (BRASIL, 2009) establishes the National Fund on Climate Change. Among its measures for the investment of resources, it provides in art. 4, item IX that PSA be made to communities and individuals whose activities are proven to contribute to carbon storage, and in art. 4, item XIII it provides the recovery of degraded areas

and forest restoration, prioritizing areas of Legal Reserve and Permanent Preservation Areas and priority areas for the generation and guarantee of the quality of environmental services. The Climate Fund, as this federal law became known, was the first regulation that inserted PSA in its elaboration. However, it is not a law that deals exclusively with PSA.

Considering the current environmental discussion and the context of Brazilian environmental policy regarding its conduct by the federal government (ABESSA; FAMÁ; BURUAEM, 2019) it is important to discuss the implementation of a national PES policy. In 2013, Bill No. 276 was proposed to institute PES in the country, and it will be filed at the end of 2018. Bill No. 3791/2019 is currently being processed proposing the establishment of the National Policy for Payment for Environmental Services (PNPSA).

The proposal for an environmental policy must consider an interdisciplinary discussion since it deals with economic, social and environmental issues. In this context, geography can contribute to the construction of solid knowledge about the application of the concepts of Ecosystem Services and Environmental Services.

This article proposes a review of the concepts of environment and ecosystem, their application in the construction of the terms Payment for Environmental Services and Payment for Ecosystem Services and the implementation of legislation on the subject in Brazil.

Concept of ecosystem

The concept of ecosystem is a basic unit of the study of ecology, adequate to express the relationship between biological and abiotic components. In the field of geography, abiotic components can be defined as the physical environment. For example, the composition of rocks, forms of relief and the climatic regime that sustain the ecosystem.

The definition of the concept of ecosystem was introduced in the literature by Tansley (1935, p. 299) as:

> But it seems to me that the fundamental conception, the whole system (in the sense of physics), includes not only the complex organism but also the complex of physical factors as a whole, constituting what we call the biome's environment - the habitat factors in the broad sense.

The author aimed to integrate the biotic and abiotic environment by defining a basic unit of analysis resulting from the interaction between living beings that inhabit a certain area,

considering the physical or environmental conditions that characterize them (CHRISTOFOLETTI, 1999).

Lindeman (1942, p. 400) proposes that the ecosystem "[...] can be formally defined as a system composed of physical-chemical-biological processes that act within a space-time unit of some magnitude."

For Lindeman (1942) as well as for Tansley (1935) ecosystems are constituted by the biotic and abiotic environment. However, he complements his proposal by defining the existing exchange between the components and the spatial scale of occurrence. The spatial delimitation of an ecosystem considers an area on a local and / or regional scale, that is, the ecosystem is delimited where the conditions of the environment have unique characteristics with significant differences concerning the surrounding environments.

In the definition of ecosystem, it is also important to consider energy flows and exchange. According to Christopherson (2005, p.588):

> [...] An ecosystem is a self-sustaining association of living plants and animals and their nonliving physical environment. Earth's biosphere itself is a collection of ecosystems within the natural boundary of the atmosphere and Earth's crust. […] An ecosystem is a complex of many variables, all functioning independently yet in concert, with complicated flows of energy and matter.

Odum (1971) emphasizes that any area composed of organisms that interact with the physical environment through the flow of energy, enabling the exchange of energy and matter between its components, ensuring the continuity of life on Earth, whether biotic or abiotic, is called ecosystem. The author also argues that the ecosystem should be the main organization level for the implementation of holistic solutions for society to solve problems at the level of the biosphere.

Considering the definitions presented, the authors agree on the need to exchange energy and, consequently, matter produced in this process. In this context, it can be concluded that the matter and energy produced are the Ecosystem Services provided to society.

Concept of environment

In geography the concept of environment is widely used due to its conceptual scope, integrating different scales. For Christofoletti (1999, p. 37):

> The term environment makes it possible to apply it to questions ranging from the world scale to the point microscale. One can speak of the terrestrial environment, continental environments, oceanic environments, lacustrine environments, plant,

> animal and human environments, the work environment, the social environment, the cultural environment, etc. The word is the same, but the meanings and expressiveness of the phenomenon mentioned are different.

The interpretation and application of this term in research consider two points: 1) the biological and social contexts where living beings are essential elements; 2) the interactive functionality of the geosphere-biosphere where the organized units include abiotic and biotic elements, being responsible for forming different sights.

Environment for Tuan (1965) is where there are specific conditions for people and other living beings to change and develop, a concept close to the proposal of Abbagnano (2003) of an environment as the complex relationship between living beings and the natural world. In this context, the breadth of the concept is highlighted with its application beyond natural characteristics, considering also cultural characteristics that encompass the social and economic structure of a society.

Ribeiro and Cavassan (2013, p.71) define environment as:

> It refers to nature thought or represented by the human mind, that is, the reality apprehended, what we are aware of through perception. It can be understood as what is known of nature by the social system, which is on the perceptible human horizon. A historically constructed human construction. It alludes to the set of environmental environments known to man and consists of phenomena that we can represent and that are capable of reacting with an organism, but that have not yet been called upon to do so. It includes those phenomena that are not immediately used, but that are capable of being used operationally by the organism.

A geographical analysis of the term environment should consider the relationship between society and nature, incorporating the "[...] physical support the traits that human work, that man as an agent, and not as a mere spectator, prints on the sites where you live." (HOLZER, 1997, p. 81). Complementing the idea, Gonçalves (1996) points out that everything that opposes the culture built by the behavior of a society can be considered nature.

With the different concepts presented about environment, it can be concluded that its definition is broader considering the relations between society and nature. In this way, society's actions cause negative or positive impacts on the environment where a given ecosystem is an integral part.

Payment for Environmental Services and Payment for Ecosystem Services

According to Wunder (2005), Payment for Environmental Service (PSA) is an instrument for managing and attracting financial resources for a service or natural resource provided by a defined ecosystem.

For Muradian et al. (2010) they are institutional arrangements that promote the transfer of resources between actors involved, thus creating economic incentives in the decisions to use individual land aimed at social interest. It can additionally be land use that ensures this service, guaranteeing the integrity of the environment and also a natural process that helps to regulate, for example, the flow of a river or the microclimate of a place.

In turn, Payment for Ecosystem Services (PES) for Smith et al. (2013) is a payment mechanism for providers of Ecosystem Services to guarantee their supply flow.

The purpose of implementing a PES or PSA is to financially reward those who produce or maintain an Ecosystem Service or an Environmental Service.

Considering this statement, according to MEA (2005), the main Ecosystem Services and Environmental Services valued today are related to the themes of water, biodiversity, carbon, scenic beauty and mountains.

Water supplied in quantity maintains the habitat for different species, configuring itself as an Ecosystem Service. Since the quality of this water depends on human actions such as sewage treatment, combating erosion along river banks, reducing deposition and transportation sediment, these characteristics are Environmental Services. The payment for the services provided is related, for example, to the use of water, reforestation activities in riparian forests and watershed management that need to employ planning, actions and execution of measures for preservation (GRIZZETTI et al., 2016).

Biodiversity, understood as the diversity of life forms, is the second theme of great importance in the provision of Ecosystem Services. For example, the pollination carried out by bees increases agricultural production and Environmental Services to maintain availability for future use. In this theme, you pay directly for land maintenance, for example, a Private Reserve of Natural Heritage, or indirectly through taxes for the maintenance of federal, state and municipal protected areas (MACE; NORRIS; FITTER, 2012; NELSON et al., 2009).

The valuation of carbon is part of the discussion on climate change and the effects of consumption and CO2 emissions. The main Ecosystem Service in this theme is the storage of CO2 by vegetation, assisting in climate regulation and minimizing the effects of pollution. We consider that this theme is inserted only in Ecosystem Services because the carbon cycle happens with or without anthropic interference (NELSON et al., 2009).

Regarding what is paid, there is the possibility of creating carbon markets, with the issuance of credits where buyers and sellers, which may be companies or governments,

negotiate tons of carbon. This type of market-based proposal presented in the Kyoto Protocol, called the Clean Development Mechanism (CDM), allows the creation of markets between countries to negotiate the purchase and sale of carbon to achieve their goals of reducing greenhouse gas emissions (GHG), not effectively combating the reduction of emissions.

In turn, in the scenic beauty theme, we can define visual beauty for recreation as an Ecosystem Service because the preserved nature can be appreciated or even worshiped since various cultures have devotion in natural aspects. In turn, the creation of a conservation unit can be considered an Environmental Service, since it was legally instituted. In this case, one pays, for example, for entry into a conservation unit, packages of tourist services, or concessions for ecotourism (SCHRIRPKE; TASSER; TAPPEINER, 2013).

One last theme used as an example is mountains that provide Ecosystem Services such as local and regional climate regulation, favoring the existence of a certain economic activity. As an example of economic activity, agriculture will provide fruit, vegetables and legumes, which can be defined as Environmental Services. In this sense, agricultural production in Environmental Services is paid or a tax is created in an environmental policy to, for example, create a fund to combat environmental degradation (GRÊT-REGAMEY; BRUNNER; KIENAST, 2012; SCHRIRPKE; TASSER; TAPPEINER, 2013).

Any benefit obtained by people directly or indirectly to sustain life using an ecosystem must be considered an Ecosystem Service. In turn, actions employed in the preservation and conservation of a given ecosystem, maintaining, recovering, or improving the availability of resources, must be considered an Environmental Service.

The legal and administrative structure used in the management of services occurs through a Payment for Services program that needs a buyer, which can be the private or public sector. In the private sector, the purchase is usually made as a form of environmental compensation for some activity that has degraded the environment. Otherwise, the purchase by the public sector is aimed at the well-being of society. On the opposite side, there is the provider, the person or institution that holds the service and guarantees its provision for a specified time (WUNDER, 2009).

The Millennium Ecosystem Assessment (MEA) is an international UN program that studies and proposes solutions for decision-makers with the link between changes in ecosystems and human well-being. Among its documents, MEA (2005) establishes the division of services into four categories:

- Provision services: responsible for the capacity of ecosystems to provide goods, for example, food, raw materials, genetic resources, water, etc.;
- Regulatory services: benefits resulting from natural processes regulating environmental conditions, for example, climate regulation, flood and erosion control, air purification, etc.;
- Cultural services: the importance of ecosystems offering recreational, educational, spiritual and aesthetic benefits;
- Support services: fundamental natural processes for the maintenance and existence of other services, for example, nutrient cycling, soil formation, pollination, etc.

The set of these services is responsible for maintaining environmental balance at the local, regional and global levels, regulating the functioning of ecosystems that are valued considering the benefits they can bring to society. The valuation of ecosystems is not restricted to the economic sense, but also considers the human sense, valuing life, forms resulting from ecosystems and the structure of society, responsible for the relationship between society and nature (AMAZONAS, 2009; ANDRADE, 2010; GUEDES; SEEHUSEN, 2011).

The definition of value involves the moral and political senses and not just monetary value. According to Sandel (2012), it is necessary to highlight that, from the moment something in life becomes a commodity, it is corrupted. For Muniz and Cruz (2015) valuation of Ecosystem Services must go beyond the economic context to recognize the values of biodiversity to conservation and promote a holistic perspective, incorporating the socio-ecological context.

The scenario of attributing economic value to nature is contradictory and Wunder (2009, p. 44) points out that "... PSA only makes the contradictions that, implicitly, apply to other conservation tools, transparent". This excerpt stresses that the monetary appreciation of natural resources already exists, even before the emergence of PSA. For example, the commercialization of wood depends on logging in some cases illegal in public forests.

Authors such as Gómez-Baggethun and Muradian (2015), McElwee et al. (2014), Muradian and Gómez-Baggethun (2013) and Pirard and Lapeyre (2014) argue that few existing PES can be considered markets in themselves because few are related to the market. Most PES programs are administered by the state as regulation of public policies and/or forms of economic incentives, such as the deduction of taxes or subsidies.

According to Guedes and Seehusen (2011), Motta (2006) and Rodriguez and Silva (2013) the values attributed to resources from Ecosystem Services considering their economic or non-economic value are (table 1):

Table 1: Economic and non-economic values of services.

Value			Aims and Example	Monetary value
Non-economic	Intrinsic		A balanced ecosystem. Shows the ability of a given Environmental System to a type of use	No
	Biological		Adaptation of species to their quality and quantity of life	No
	Cultural		The value attributed by a social group to a given Environmental System	No
Economic	of use (the result of the use of a certain natural resource to provide well-being to society)	Direct: real benefits for society of the use of a certain natural resource	- Wood extraction; - Medicines; - Food	Yes
		Indirect: value is given to the functions performed by natural resources for an indirect benefit	- Climate regulation; - Maintenance of water cycles; - Carbon storage	Yes
		Option: certain use can promote the well-being of society in the future	- Biodiversity - Preservation of habitats	Yes
	non-use	Existence: preserve a certain environment simply because it exists	- Habitats - Endangered species	Yes
		Legacy: conserving something, allowing new generations to benefit	- Protection of some unknown species; - Cultural Values	Yes

Source: Organized by the authors from Guedes and Seehusen (2011), Motta (2006) and Rodriguez and Silva (2013).

By assigning values to Ecosystem Services, it is possible to identify which social and environmental gains and losses are involved in the exploitation of a resource or the ecological imbalance caused by a change in land use.

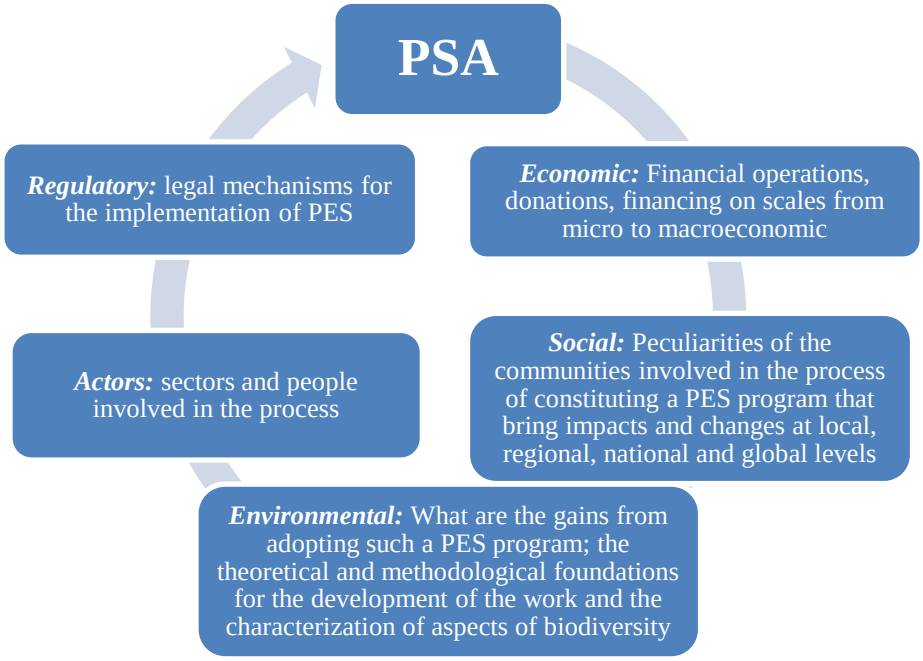
PSA involving economic, social, environmental and political contexts is a management instrument with the potential for significant improvement in environmental quality if applied well, or with the possibility of adverse results if not well planned. Its differential feature in relation to a traditional environmental policy of disincentives is precisely the incentives given to landowners (BÖRNER et al., 2017).

The situations of benefits from Ecosystem Services include different factors to be considered, one of which is the participation of the population in the process, gaining awareness

of how they will receive these benefits. For that, it is necessary to guarantee the participation of local actors (representatives of the population) (BRACER et al., 2007; PAGIOLA et al., 2005; WUNDER, 2007).

According to TNC (2017) different sectors and subjects encompass the context of formulating public policies for PSA and must be considered. They are (Figure 1):

Figure 1: Steps for formulating public policies on PES.



Also according to TNC (2017), understanding and discussing the contexts involved is a basic step for the formulation of a public policy to solve issues of public interest and has the following basic steps: What are the objectives of the PSA program; What is the planning for the implementation and monitoring of the PSA; Technical basis (which Ecosystem and Environmental Services will be considered and identification of providers and beneficiaries); Economic aspects and sources of funds.

The steps above are fundamental in the development of projects on Payment for Services, whether Ecosystem or Environmental, and must be considered when formulating specific legislation on the subject.

This topic presented the main examples of PSA and PES considering the literature review, the definition of broad value not only in the financial context and a proposal for steps to formulate a PSA and PES policy.

A National Policy for Environmental Services and Ecosystem Services for Brazil

Since the 1980s, the federal government has implemented different programs and laws to promote the sustainable management of land (ASSUNÇÃO et al., 2012). The Federal Constitution of 1988 in its article 225 emphasizes the importance of an ecologically balanced environment, fundamental for the maintenance of human well-being, establishing in §3 the obligation to repair damage caused to the environment by a public or private entity.

The wording served as a legal basis for drafting different environmental legislation. In 2009, Federal Law nº 12,114/2009, regulated by Decree nº 7,343/2010, created the National Fund on Climate Change (FNMC). In its article 5, §4, item XI, it establishes the investment of resources from the fund in "payment activities for Environmental Services to communities and individuals whose activities are proven to contribute to the storage of carbon, linked to other Environmental Services." It is a legal measure that regulates the action of public authorities in actions to combat climate change.

In 2011, Federal Law nº 12,512/2011 was approved, which institutes the Bolsa Verde Environmental Conservation Support Program, regulated by Decree nº 7,572/2011. Among the objectives of this law, article 1, item I emphasizes the incentive to conserve ecosystems, understood as their maintenance and sustainable use, and item II provides the promotion of citizenship, the improvement of living conditions and the increase of income of populations in a situation of extreme poverty who carry out activities to conserve natural resources in rural areas.

In the following year, 2012, the new Forest Code (Law nº. 12,651/2012) was approved, which in Article 41, item I established the possibility of implementing PES programs based on MEA, seeking to assign monetary and non-monetary values to use and non-use services. To date, the Forest Code is the most recent and detailed legislation on the subject.

The first specific law on PSA, Bill nº 276/2013, moved through the National Congress until the end of 2018 and was then filed. In its article 1 this bill provided "to discipline the performance of government on Environmental Services, to promote sustainable development and to increase the provision of these services throughout the national territory."

This bill suggested as instruments for the implementation of PSA the Rural Environmental Registry (CAR) and the creation of the Urban Environmental Registry (CAUrb). The geographic database established by the declaration of the owners of these two cadastres would then be a necessary condition for the PSA and would gather the necessary data about the

environmental services existing in urban and rural areas. It is necessary to highlight that the CAR's individual and mandatory declaration needs to be validated before such a database can be used as a basis for public policies, avoiding fraud and errors in the delimitation of areas.

This bill, with a more in-depth discussion in academia and society, could have greater visibility and the possibility of approval. The two sectors would contribute to the services provided by Brazilian ecosystems, establishing the first specific legal framework on the subject.

In 2019, Bill 3791 was introduced, proposing the establishment of the National Policy for Payment for Environmental Services (PNPSA). Its art. 5 establishes the objectives, which are to regulate the registration and inventory of environmental services, establish guidelines for the valuation of environmental services, encourage sustainable development and encourage society to adopt actions for the production of environmental services. This bill is a continuation of Bill 276/2013.

However, its article 7 forbids the investment of public resources in the payment of Environmental Services, which makes it difficult to invest resources to guarantee the well-being of society, promoting the creation of a market that can cease to exist at any time, resulting in losses in the environmental quality of the site where the PSA was implemented.

The debate on the topic is still largely restricted to academia and some sectors of society, making it difficult to provide greater well-being for large sections of the population, the basic objective of any action based on the principles of MEA (2005).

It is important in regulations after an Environmental Services law to adopt clear articles on what services will be considered, and whether use and non-use values for that service will be considered. That makes it possible to differentiate Environmental Services that involve some relationship with society, such as management and preservation practices, or to adopt the term Ecosystem Services when the service to be valued does not depend on human intervention. After all, it is an integral part of an ecosystem.

So far, both the Forest Code and Bills No. 276/2013 and 3791/2019 have used the term Environmental Services in their texts, emphasizing in the discussion the changes in land use and direct actions of society on the environment.

It is necessary to highlight that even though society does not receive monetary value directly, Ecosystem Services that maintain flows of the ecosystem, such as the hydrological cycle, carbon absorption capacity and cycling of nutrients, among other processes that sustain

life and biodiversity, are responsible for providing Environmental Services, such as food, drinking water and wood essential for life.

Final considerations

- From the second half of the twentieth century the environmental discussion is highlighted worldwide due to the greater engagement of countries in common goals to reduce the consumption of natural resources and minimize the effects of the anthropic intervention on nature.
- Among the conceptual proposals on Ecosystem Services, Daily (1997) gains greater prominence. The paper Costanza et al. (1997) measured the monetary value of Ecosystem Services and the natural capital of the world is widely discussed and criticized for its economic bias. Studies with this theme receive criticism until today. How much is a natural resource worth? How long will it maintain a profitable value?
- On the other hand, studies on global environmental changes are increasingly frequent, using different statistical techniques and modeling in different areas of science, reaching the consensus that the dynamics of the planet are changing and it is necessary to implement effective policies and actions to adapt and mitigate these changes.
- When considering global environmental changes, there is a certain consensus in the scientific community about the effects of CO_2 on the climate and the importance of native vegetation in the carbon storage and recycling process. Therefore, this becomes an Ecosystem Service of fundamental importance for climate regulation at the local, regional and global levels.
- Considering this point, Ecosystem Services are not only monetarily measurable. Their non-monetary value must be considered because that is what will effectively contribute to the improvement of the population's well-being.
- In Brazil, publications on the theme of Payment for Services use the term Environmental Service more often. When considering the country's biodiversity and economic growth related to agribusiness, it is possible to conclude that the need to increase production to supply the population leads authors to consider the monetary aspect of services more than the non-monetary aspect.

- At this point, actions to preserve, recover or improve the availability of resources must be used, such as the delimitation of Permanent Preservation Areas, Private Natural Heritage Reserves and Legal Reserves.
- Environmental Services result in some marketable product, therefore the term should be used in studies and proposed environmental planning for the management of natural resources.
- In turn, Ecosystem Services are related to the maintenance of flows and energy necessary for the maintenance of an ecosystem, for example, the cycles, hydrological, carbon. They are natural processes that can be altered by anthropic action, consequently affecting the population's well-being in a direct or indirect way. These processes do not necessarily have an economic value, but they are fundamental to the well-being of society.
- Therefore, we consider the discussion of the concepts of Environmental Services and Ecosystem Services to be essential, since they will direct the public actions of planning and environmental management.
- With proper conceptualization, it is possible to create management and control mechanisms that guarantee the maintenance and expansion of the availability of natural resources that not only sustain the market, but also effectively contribute to the maintenance of human well-being.

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