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# REDD LEGAL SYSTEM IN PERNAMBUCANA CAATINGA

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## ABSTRACT

The State of Pernambuco undergoes the various effects of climate change. One of the anthropic actions that contribute to this situation is the deforestation of the vegetation in Caatinga biome. Aiming to reconcile the protection of native vegetation and minimization of actions that contribute to the greenhouse effect, the instrument called Reduction of Deforestation and Forest Degradation (R. E. D. D) appears in the international scenario. The R. E. D. D is a type of Payment for Environmental Services (PES) based on the principle of Environmental Law called protector-receiver. Thus, the present study ought to characterize the legal aspects for effectiveness in Pernambuco. For that, we analyzed the laws and publications (official and

non-official) related to the implementation of this model at the state level. The results demonstrate that it is possible to implement the instrument in Pernambuco, because in the State there is a legal framework created to implement the instrument ranging from the definition of responsibilities to the development of an institutional arrangement.

**Keywords:** Payment for Environmental Services; Carbon; Climate Changes; Pernambuco.

*SISTEMA JURÍDICO DA R. E. D. D NA  
CAATINGA PERNAMBUCANA*

**RESUMO**

*O estado de Pernambuco sofre os diversos efeitos das mudanças climáticas. Uma das ações antrópicas que contribuem para esse quadro é o desmatamento da vegetação do bioma Caatinga. Almejando conciliar a proteção das vegetações nativas e minimização das ações que contribuem para o efeito estufa, aflora no cenário internacional o instrumento denominado Redução do Desmatamento e da Degradação Florestal (R. E. D. D). A R. E. D. D é uma espécie de Pagamento por Serviços Ambientais (PSA), que possui como fundamento o princípio do Direito Ambiental denominado protetor-recebedor. Assim, o presente estudo buscou caracterizar os aspectos legais para a efetivação no estado de Pernambuco. Para tanto, analisaram-se os diplomas legais e publicações (oficiais e extraoficiais) relativos à concretização desse modelo na esfera estadual. Os resultados demonstram que é possível a implantação do instrumento em Pernambuco, pois, nesse estado, existe todo um arcabouço legal criado para efetivação do instrumento, que vai desde a definição de responsabilidades até o desenvolvimento de um arranjo institucional.*

**Palavras-chave:** *Pagamentos por Serviços Ambientais; Carbono; Mudanças Climáticas; Pernambuco.*

## INTRODUCTION

The situation in Pernambuco is an interesting *case* for analysis regarding the vulnerability caused by the effects of climate change and the importance of state legislation that fits the situation of the federated entity in focus. The state has a territorial area of approximately 98,146 km<sup>2</sup>, sheltering a great diversity of ecosystems. About 8,000 species of organisms have been recorded and, as many groups have not yet been studied, it is estimated that this number ranges from 24,000 to 90,000. Such biological diversity contrasts with the high levels of degradation of the Atlantic Forest and Caatinga ecosystems, with 12% and 50% of their original coverage respectively (PERNAMBUCO, 2011; SOS MATA ATLÂNTICA, INPE, 2015).

The regions of Agreste and Sertão, places where the Caatinga is predominant, present great anthropic pressure on the natural resources, especially the forest. Man's actions are intensified, resulting in areas depleted by the consumption of firewood and the intense urbanization process both in the Metropolitan Region and in other economic centers, such as the Araripe region (PERNAMBUCO, 2011).

The accumulated environmental liability on the state is evident and is considered by the Intergovernmental Panel on Climate Change (IPCC) as a global *hotspot* for climate change. While in the coastal area the erosion process intensifies on the beaches, with imminent threat to the public and private patrimony, the Sertão and Agreste region suffers from the drought phenomenon, together with the desertification process, a fact that strengthens the emergence of groups called refugees and or environmental displaced persons (AMORIM; BARROS, 2017).

In the interior, according to national criteria, Pernambuco has 135 municipalities in areas susceptible to desertification (DSA), where according to the 2000 population census, 2,622,519 million inhabitants live, conforming a demographic density of 35.34 inhabitants/km<sup>2</sup>. This may lead to migratory processes, shifting affected populations to urban centers, overloading services in this region and further aggravating socioeconomic conditions (PERNAMBUCO, 2011).

The State Policy to Combat Climate Change in Pernambuco (PEEMC/PE) is the main instrument of the State Government to combat climate change. Published in 2010, this action can be understood as a response to the fragility that the state has in the face of the changes, given

the consequences that are felt in several regions. As a result, Pernambuco has won a series of programs focused on climate change and expanded the budget of others already existing in the environmental sphere.

Among these instruments designed by PEEMC is the Reduction of Deforestation and Forest Degradation (REDD). Created at the international level in the so-called Conference of the Parties (COPs), this mechanism is based on the concept of Payment for Environmental Services (PSA) and seeks to include, through market incentives (carbon credits), the increasing rates of forest area, based on native areas remaining in the landscape (ANGELSEN, 2008).

The main difference between REDD and the other instruments developed so far that work on climate change is that, in the first, there is in theory the socio-environmental inclusion of populations that are commonly marginalized in the discussions and decision-making about the conservation of natural biomes (GRAINGER and OBERSTEINER, 2011). In addition, it has as its core the maintenance of the native vegetation, an aspect that directly brings to light the discussion about the value (economic and political) of the forest “on foot” (HAYES; PERSHA, 2010).

In addition, Article 4 of the National Policy on Climate Change (PNMC) provides for the strengthening of anthropogenic removals by sinks of greenhouse gases in the national territory, as well as conservation and recovery of environmental resources, especially large natural biomes (Gomes *et al* , 2006). In this context, the use of greenhouse gases (GHGs) can be considered as an important tool for assessing the effectiveness of greenhouse gases collection.

Therefore, given this framework, this article aims to analyze the legal framework for REDD implementation in the Caatinga of Pernambuco. In addition, as a theoretical substrate for discussion, a brief examination of PEEMC/PE and the State Policy on Payments for Environmental Services will be made, based on the legislation and the doctrine of Environmental Law, always seeking an interdisciplinary dialogue.

## 1 METHODOLOGICAL CONSIDERATIONS

To obtain the proposed objective, an analysis was made of the most varied legal instruments that can be used as a basis for the implementation of REDD in Pernambuco. In this sense, the main sources of consultation were the regulations, both nationally and statewide. At

the national level, the research was based on official publications from the Ministry of the Environment (MMA) and the Ministry of Science, Technology and Innovation of Brazil (MCTI).

At the state level, State Law No. 14,090/10 (State Policy to Combat Climate Change), together with its plan, and State Law No. 15,809/16 (State Environmental Payments Policy) were analyzed. With this, it was tried to emphasize, among the presented legislations, the main aspects that favor, or at least makes possible, the concretization of the instrument in the political-legal aspect. There is a caveat that it is not intended to exhaust the analysis of legislation in all its aspects, but only in what can be used as a rationale for the establishment of REDD.

Thus, the evaluation of the State Policy to Combat Climate Change in Pernambuco was initiated with the analysis of the text of the standard. By means of this, it is sought to glimpse the existence of a balance between the actions of adaptation and mitigation to the climatic changes. To do so, they have been explored from the principles guiding politics to the objectives sought and the instruments established to achieve them. These elements were confronted with what is observed of the actions envisaged and carried out by the public power, in order to evaluate whether the principles and objectives are in line with what was accomplished and, thus, to analyze whether the policy is serving as a guide for public actions.

In relation to the State Policy on Payment for Environmental Services (PEPSA), its objectives were identified as well as the institutional arrangement created by the law, the proposed instruments and the susceptible areas (requirements) to receive PSA Carbon projects. It should be emphasized that, since the research focus is on REDD, only the topics related to this issue were examined, leaving for the future the study and analysis of the whole of the Policy.

## **2 RESULTS AND DISCUSSION**

### **2.1 Payment for Environmental Services (PSA): Protector-Receiver Principle**

When one thinks of the relationship between economy and the environment, the first lesson is that of antagonism, that is, things that are opposite and incommunicable. Certainly, a consequence rooted in the economic model based on the incessant search for the savage profit that

despises the relation of the economic and natural systems, besides not considering the existence of ecosystemic limits.

Nevertheless, nature is the basis of economics, insofar as it supplies raw materials to be transformed and circulated in the form of commodities. It turns out that, paradoxically, the logic of capitalist production encourages/allows an irrational and suicidal appropriation of resources.

The theory for this paradox has been well described in Garret Hardin's *The Tragedy of Commons*, for in fact the rational maximization of individual interest in environmental goods which, in theory, can not be exclusive and rival, puts at risk the existence of the good itself, which, not by mere coincidence, is essential to the maintenance of one's own life. However, this aspiration without any kind of regulation can cause, and is already causing, a series of negative consequences for humanity, ranging from the exhaustion of non-renewable resources to the increase in temperature on Earth.

Therefore, according to Nusdeo (1975), environmental problems are real and serious, but they do not justify merely emotional reactions of the "zero growth" type. For the author, the only lucid attitude corresponds to the internalization of the social costs of environmental deterioration in the economic circuit. The dichotomy (nature x economy) was justified while natural resources seemed inexhaustible, because, in fact, there was no predictability of scarcity.

As consumption has been rapidly dissipating these resources, concern for natural foundations has become necessary; however, the difficulties of governance of the common goods (air, water and biodiversity for example) caused a concern, as the exhaustion of these and the saturation of environmental services became increasingly palpable.

Thus, the harmonization between economy and ecology has become a *sine qua non* condition for the survival of the economy itself and, consequently, of mankind. Constanza (1991) argues that traditional economic models and concepts, as well as ecological ones, are in short supply in dealing with global problems.

As mentioned elsewhere, this relationship is fundamental for understanding the heterogeneity of situations in mankind, as well as for building a sustainable future; however, this relationship does not fit into any existing scientific discipline. Martinez-Alier (2007) suggests, because of this epistemic gap, the need for a "orchestration of sciences" involving

diversity of thoughts, a framework that is widely diffused with the development of inter and/or transdisciplinarity. Given this framework, it is precisely in this complex scenario that emerged and gained prominence in recent years Environmental Law as a branch of Legal Science, whose purpose is the protection/management of environmental resources.

In general terms, the instruments covered by Environmental Law can be of two shades: (i) command and control or (ii) economic. In short, the first are the rules laid down that, in theory, capturing the values of society, define limits of the performance of man, especially the economy. They act with a strong presence of the so-called state police power, since they limit individual freedoms in favor of collective well-being. However, throughout the journey through the implementation of environmental protection, it was realized that the simple prohibition of deforestation, for example, was not enough to reduce economic pressure on forests.

In this way, economic instruments capable of complementing the limits of command and control tools were sought through financial incentives. Achieving truly sustainable development, however, requires the balanced use of command and control tools, along with economic mechanisms. Within this framework, the Environmental Services Payment (PSA) emerges.

Following this approach, before working with the PSA perspective, it is necessary to define what Environmental Services, also called by some authors Ecosystem Services, are. Lederer (2011) defines ecosystem services as processes whose natural ecosystems and the most varied species that form it are able to sustain and provide necessary conditions for the maintenance of the life on Earth.

In the same vein, Ollivier (2012) presents a definition on ecosystem services, characterizing them as the contributions made by ecosystems to human welfare, being this in the form of commodities, such as food and fresh water, or services, such as reduction of enchen and carbon sequestration.

It is precisely in order to safeguard these ecosystem services that legal mechanisms have been developed under the law, more specifically in the environmental field, through its standards and, above all, its principles. Nusdeo (2012) affirms that the basis of payment for the fulfillment of legal duties starts from a more pragmatic argument, such as the lack of effectiveness of the instruments of command and control, but it goes through the principles of principles such as the notion of the protector-

receiver, which emphasizes the benefits of conservation for the community, albeit stemming from legally determined practices.

The ontological foundation of the PSA is based on the so-called protector-receiver principle, which proposes payment to those agents whose actions promote the increase of environmental services provided by nature. According to Nusdeo (2012) and Sirvinskas (2017), this is a real mechanism for the internalization of positive externalities.

The novel principle is always analyzed in opposition to the consolidated polluter-payer principle, which also consists, in the last analysis, of the assimilation and consequent internalization by the productive system of the so-called negative externalities. Moreover, in Milaré's view (2013), for effective internalisation, all environmental externalities should objectively produce conditions that do not allow the economic operator to be more profitable to pollute than to implement preventive measures.

In this perspective, Law (with the indispensable help of Biology and Economics) is the sociopolitical framework that regulates life in society and, consequently, the relation of this social body to the environment in which it lives, through its institutions, for the purpose of undertaking the protection of the environmental good, directly or indirectly.

Just as the legal system, holistically considered, must be sustainable, its institutions must be thought or created following the same logic, that is, it must first of all create an institutional environment or field that is able to absorb and harmonize the rules of the society, so as to be perfectly embedded in the gears of the ecosystem, but at the same time capable of being modified in accordance with the interests of the society it regulates. From this need for renewal of environmental management instruments comes the PSA. Thus, law takes on a role of promoter of ecologically appropriate behavior and not only repressor of the inappropriate.

Payment for environmental services is one of the main tools developed by the environmental economy to realize the idea of the internalisation of nature in the production function. For Wunder (2005), PSA is a voluntary transaction through which a specific ecological service is purchased by one (or more) purchasers of one (or more) environmental service provider, if and only if the service provider ensures their provision. Therefore, there are five requirements: (i) a specific ecological service; (ii) an acquirer; (iii) a provider; (iv) the obligation to provide the service and (v) voluntary transaction.



In summary, a single environmental service is selected, provided by an owner/guarantor who undertakes to provide it in exchange for a payment, not necessarily financial. However, the development of ecological science reveals that the interaction between the functioning of ecosystems and the benefits they provide to society requires a systemic and interdisciplinary view of economic instruments. It is not by chance that the study of the legal structure of PSA and, consequently, of REDD, is ontologically heterogeneous as far as its sources of information are concerned.

The functions provided by ecosystems, which are *a posteriori* valued, are the constant interactions between their structural elements, including energy transfer, nutrient cycling, gas regulation, climate and water cycle regulation, carbon storage, among others (DALY; FARLEY, 2004). Therefore, ecosystems are not only formed by individually considered species, such as, trees, animals, water, ores, among others.

For a holistic and more credible analysis, one must consider the energy and matter flows that underpin these complex interactions, that is, their functions that are significantly sensitive to human action. These functions, when viewed from the point of view of their usefulness to humanity, are called services. However, according to Boyd and Banzhaf (2007) these functions do not always establish a direct relationship with a service, that is, a single ecosystem service can be the product of two or more functions, or a single function can generate more than one service ecosystem. In addition, it should be noted that this relationship between goods and functions can occur at various spatial and temporal scales, which makes their understanding and analysis an even more complex task

Finally, as Cunha (2015) suggests, a reformulation of the very concept of PES is to be implemented, not only with the aim of preserving or recovering a single environmental service, but a given ecosystem, as well as considered as a set of physical, chemical and biological processes.

A complex view of environmental services, of course, makes it difficult to understand, since a myriad of interrelated and correlated processes are identified. This difficulty becomes even more diffuse when one thinks of a mechanism that must take these interactions into account and, at the same time, ensure their protection against the pressure of the economy. Without a transdisciplinary methodology, there is no way to achieve sustainable development.

Muradian et al (2010) advocate a redefinition of the PES concept,

bringing a broader approach to services of nature, including taking into account sociocultural factors in program implementation. However, this complexity is reflected in the legal aspect, which now requires an institutional design, which, adapting to the variability of local characteristics, favors the maintenance or recovery of environmental quality, at the same time that favors the economic and social development of a given locality, which is fundamental to regulate the functioning of the flexibilization role of the Law.

In some cases, as in Costa Rica, a real institutional arrangement was created at the national level for its implementation, with an intimate relationship between the legal system and disciplines such as Biology and Economics; however, there are cases, as in Brazil, where, even without a national legal framework and a disciplinary exchange, it is possible to identify state and even local experiences.

A criticism that deserves reverberation is proposed by Martínez-Alier (2007), supported by Contanza (1991), in which lies the so-called incommensurability of environmental goods and services. In fact, the simple valuation and internalization of environmental goods into the production function, as environmental economists argue, is not enough to correct the imperfections of the Economy.

It is worth noting that several valuation methods are even feasible, being applicable in several countries, including Brazil; but the attempt of objectivity and interdisciplinarity significantly elevates transaction costs that make some methods economically unviable and with serious technical constraints. However, there is nothing to prevent the elaboration of experiences, models, articles and books that bring to light the experience of these actions, further enriching the intellectual patrimony of those who are interested in the study of PSA.

Also, in this perspective, bringing forestry environmental services more specifically, and in light of the new methodologies for quantification of PES, REDD arises, which provides financial compensation to those who avoid or reduce emissions, deforestation and degradation. These programs are perfectly in keeping with the idea of PES, so that “standing” forests, which offer us numerous services, support the flows and resources essential for ecological balance.

## 2. 2 State Policy to Combat Climate Change (State Law No. 14.090/10)

The State Policy to Combat Climate Change (State Law No. 14,090/10) brings in its scope the standard presentation for Brazilian environmental regulations: concepts, objectives, and instruments. Such formatting, according to Milaré (2013), reveals the intention of facilitating the access of the general population to the content of the standard. In addition to these elements, it also presents the chapter called “Mitigation and adaptation strategies”, in order to detail the fields of action of the legislation.

Notwithstanding the pedagogical character presented by the law, its content, in the conceptual presentation, present in art. 1 and subsections, shows its relevance to the main agreements and conventions concerning climate change. Expressions such as CDM (Clean Development Mechanism), REDD (Reduction of Deforestation and Forest Degradation) and carbon market are present. The overall goal is presented as follows:

Art. 2 The State Policy for Confronting Climate Change aims to guarantee to the population that the Public Power will promote the necessary efforts to increase the population’s resilience to variability and climate changes in progress, as well as contribute to the reduction of concentrations of greenhouse gases in the atmosphere, at levels not harmful to populations and ecosystems, ensuring sustainable development (PERNAMBUCO, 2010).

By the initial reading of the *caput*, it is perceived *prima facie* that the Public Power brings to itself the responsibility for the implementation of the State Policy. According to Fiorillo (2014), such an attitude in environmental matters is not the most appropriate one to adopt. The author rightly argues that, as far as the environment is concerned, responsibility must be divided between society and private initiative, in addition to the Public Power, within the scope of institutional and legal possibilities. To do so, it brings as an example the text of the 1988 Federal Constitution, in its art. 225, in which the intention of the constituent legislator is clear (and explicit) of the incumbency imposed on the Public Power and the collectivity as to the duty to defend and preserve the environment for present and future generations (BRASIL, 1988).

It is vital to emphasize that, assuming an interpretation according to

the Constitution and based on hermeneutics compatible with environmental matters, the general objective of the Pernambuco law does not exempt the collectivity and the companies from assuming the *pro-natural* stance regarding climate change. Of course, the opportunity to expressly express this relationship is lost. Ost (2015) argued that, in addition to a moral and political impact, the legal embodiment of environmental issues, in this case climate change, opens a range of benefits of several orders, providing a factual impact on (re) and of the Public Power.

Rothenburg (2005) considered that the mere mention in normative texts has a prominent importance, since it evidences the value of the environment and signs a commitment of implementation with those involved. However, it would be utopian to think that only with the wraparound of the law the climate would be protected, since at various moments, whether by political decision or material conditions, protection of the environmental good is left in the background (REIS NETO, SILVA, ARAÚJO, 2016).

Consistent with its material aspect exposed in the first articles, the specific objectives are fully focused on the economic approach of the environment. Precepts such as “I - create economic, financial and fiscal instruments for the promotion of the objectives, guidelines, actions and programs provided for in this Law”, “II - foster the creation of market instruments for the mitigation of GHG emissions”, “XIV - promoting sustainable patterns of agricultural activities in the light of climate change considerations “and” promoting a system of payments for environmental services “show the presence of objectives strictly linked to a view based on the protector-receiver principle described by Sirvinskas (2017).

In addition, the strategies adopted by the Policy are revealed according to the economic sector of the activity. Divided into fourteen sections (1-Energy, 2-Transport, 3-Industrial and Mining, 4-Public Sector, 5-Agriculture, 6-Biodiversity and Forests, 7-Water Resources, 8- 10- Health, 11-Ocean and Coastal Management, 12- Semi-arid and Desertification, 13- Land use and urban vegetation cover, 14 - Command and Control Instruments), the mechanisms envisaged impose on the State Government since actions related to environmental education for the community until the investigation and monitoring of the risk factors for life and health resulting from climate change. Moreover, the strategies mentioned in the norm incorporate the ideal of the Public Power as the main agent responsible for the effectiveness of the actions, leaving the

collectivity and the private sector as mere receivers of commands coming from the power emanated by the Administration.

In the chapter on instruments, divided by typology (1 - State Plan for Climate Change, 2 - Information and Management Instruments, 3 - Economic and Fiscal Instruments, 4 - Projects to Mitigate Greenhouse Gas Emissions, 5 - Sustainable Bids, 6-Education, Research, Communication and Dissemination, 7-Civil Defense, 8-Financial Resources for Actions to Combat Climate Change and Environmental Services), unlike other environmental laws, such as the National Environmental Policy Federal Law No. 6. 938/81), this chapter does not only include specific instruments (Environmental Licensing, Assessment of Environmental Impacts), but rather, true guidelines for the accomplishment of the specific objectives previously foreseen.

Due to the initial proposal of the present research, the focus will be given on the instrument that defines a true organization chart for the implementation of the policy as a whole, “aiming to base and guide the implementation of the long term PEEMC, with planning horizon compatible with the implementation of its programs and projects” (PERNAMBUCO, 2010).

The State Plan for Climate Change presents three basic lines of goals to be achieved over the course of six years, from its promulgation: mandatory targets, general goals and sectoral goals. The mandatory targets are set forth in art. 23 of the PEEMC. They have this denomination because they base and guide the implementation of the policy; basically, are the basic structures that have the scope to base the basic substrate of the legal diploma. The infinitesimal content to be effective is considered; the true existential minimum of the concretization of the policy (PERNAMBUCO, 2011).

Among the mandatory targets, a total of nine should be highlighted, due to their potential for action: the diagnosis of the current situation of climate change in the State, containing the mapping of vulnerabilities and susceptibilities to the expected impacts; inventory of the State’s contribution to the Brazilian emission of greenhouse gases; socioeconomic and ecological zoning of climatic risk and the establishment of guidelines and criteria for Reducing Emissions from Deforestation and Forest Degradation Projects (REDD).

Regarding the general goals, these were conceived through the definition of its components, thematic axes and areas of action, seeking to

determine actions for the implementation of PEEMC, in a way connected with the other public environmental policies of Pernambuco. The function of these goals is to provide a connection with other policies that affect the climate problem, in order to develop integrated actions. In relation to the components (Figure 1), they are divided into two: adaptation and mitigation.

According to PEEMC, in article 1, item I, adaptation is considered the “set of initiatives and strategies that allow the adaptation, in natural or man-made systems, to a new environment in response to climate change current or expected” (PERNAMBUCO, 2010). Already mitigation, for the purposes of the state policy, in article 1, item X, considers the “human action to reduce emissions by sources or to increase the sinks of greenhouse gases” (PERNAMBUCO, 2010).

Figure 1: Components, axes and areas of action of the State Climate Plan.



Source: Prepared by the Author.

The proposed thematic axes are divided into 3: combating desertification; coastal management and urban management. Finally, in relation to the area of operation, which can be understood as the means by which it intends to equip the objectives proposed are systematized into three groups: monitoring/environmental control; education, research

and environmental technology; and economic instruments/environmental management. In this division, the approaches given by the State Government are clear. In the first moment (monitoring/environmental control), we can see the instruments directly linked to the state environmental police power, which consists of the authority available to the Public Administration to condition and restrict the use and enjoyment of assets, activities and individual rights, for the benefit of the community or the state itself (MILARÉ, 2013).

Furthermore, the area of activity called “education, research and environmental technology” integrates the need for programs and actions aimed at the development of initiatives in the field of technological development about measures that can subsidize the implementation of the policy itself. In this case, in a crystalline way, the Public Power acknowledges the need for constant updating and the need for integration among the various actors involved in the advancement of politics (Figure 2).

Figure 2: Scheduling of the schedule foreseen in the Plan and the diversity of actors involved in the implementation of the goals.

ADAPTAÇÃO: METAS MÍNIMAS PREVISTAS EM LEI ESTADUAL		Anos					
Atividades	Agentes Envolvidos	I	II	III	IV	V	VI
Revisão do Zoneamento Ecológico Econômico Costeiro –ZEEC - de Pernambuco, incluindo os novos condicionantes decorrentes das Mudanças Climáticas	SEMAS, Prefeituras dos Municípios Litorâneos, Universidades, ONG'S	■	■	■			
Elaborar o Zoneamento Ecológico Econômico do semi-árido de Pernambuco, incluindo as questões decorrentes dos efeitos das Mudanças Climáticas	SEMAS, EMBRAPA, CONDEPE/FIDEM, Universidades, ONG'S	■	■	■	■		
Diagnóstico dos sistemas naturais das bacias hidrográficas de Pernambuco, identificando as potencialidades e disponibilidades hídricas das bacias e sua evolução face aos cenários de aquecimento para os anos de 2020, 2030, 2040 e 2050.	SEMAS, SRHE, CPRH, Comesa, APAC, ANA, CODEVASF, Universidades, ONG'S	■	■	■	■	■	■
Identificação e Diagnóstico das áreas críticas de desertificação no território de Pernambuco	SEMAS, EMBRAPA, Universidades, ONG'S	■	■	■			
Elaboração do Mapa de Vulnerabilidade Ambiental do semi-árido de Pernambuco	SEMAS, EMBRAPA, CONDEPE/FIDEM, Universidades, ONG'S	■	■	■			
Elaboração dos Mapas de Vulnerabilidade Ambiental dos municípios litorâneos de Pernambuco	SEMAS, Prefeituras dos Municípios Litorâneos, Universidades, ONG'S	■	■	■			

Source: Adapted by the author (PERNAMBUCO, 2011).

Rescuing the position adopted along the PEEMC and the plan itself, the economic instruments/environmental management demonstrate the tendency, both positive and contemporaneous, to minimize the problems related to the environment, combining a presence in both the command and control tools and the positive incentive tools, using, for this, mechanisms such as environmental taxation, payment for environmental

services, among others (REIS NETO, SILVA, ARAÚJO, 2016).

Finally, sectoral goals are nothing more than a listing of what is intended to be implemented in various sectors of society that are present in the PEEMC, in the chapter on strategies, such as energy sector, transportation sector, biodiversity and forests.

In addition, the plan generally establishes very abstract concepts and basically a schedule of activities related to state policy. He does not care for a facticity. When outlined, the goals do not reveal how they will be achieved. In spite of such situations that hinder the implementation of the plan, it fulfills its main objective, which is to demonstrate when, theoretically, each stage of the State Policy will be made.

### **2. 3 State Law on Payments for Environmental Services of Pernambuco (State Law No. 15,809/16)**

According to the progress of the thematic and the dissemination of practices that contribute to the application of knowledge related to the PSAs, the state of Pernambuco, through its central organ of the State System of Environment (SISEMA), namely, the Secretariat of Environment (SEMAR), has developed State Law No. 15,809/16, also called State Environmental Payments Policy (PEPSA), with the objective of standardizing the practices/programs based on the PSA.

The main function of this law is to try to promote and promote, with the minimum of legal certainty for the State and for the individuals involved, the use of PSA as an environmental protection tool. Notwithstanding this more general objective, soon in art. 2, the standard has the following specific objectives *in verbis*:

Art. 2 (...):

I - encourage the market for environmental services and recognize their economic and social value;

II - to encourage the recovery, maintenance and improvement of equilibrium conditions

protected areas, especially in areas of legal reserve, permanent preservation, conservation units, areas susceptible to desertification, estuarine areas, aquifer recharge areas and/or water supply;



III - preserve, recover and/or conserve the environmental patrimony of the state of Pernambuco, in order to facilitate the provision of environmental services by local ecosystems, observing the specificities of the Caatinga and Mata Atlântica biomes with their associated ecosystems;

IV - to promote projects of Payment of Environmental Services - PSA that benefit peoples and traditional communities, defined in the form of Federal Decree No. 6,040, dated February 7, 2007, rural settlements and family farmers, defined in Federal Law 11,326 of July 24, 2006, in order to strengthen their identity and respect for the cultural diversity, with conservation, preservation, sustainable use and recovery of natural resources;

V - to promote the market for environmental services;

VI - to give effect, at the state level, to paragraph 109 of the decision of the 21st Conference of the United Nations Framework Convention on Climate Change, COP 21, which refers to “recognition of the social, economic and environmental value of voluntary mitigation activities” (PERNAMBUCO, 2016).

It should be observed *prima facie* that the stance taken by this standard was the encouragement of the use of mechanisms based on the principle of positive reinforcement, that is, the protector-receiver, and consequently meeting the most recent international agreements signed at the Conference of the Parties (COPs). In addition, another important point is the fundamental participation of the various social actors in this implementation process, consubstantiated in the strengthening of projects that focus on traditional peoples and communities, as well as rural settlements and family farmers (article 2, IV).

According to Veiga (2010), PEPSA adopts a vision based entirely on sustainable development, as it emphasizes a union between economic (monetary values reverted with PSA), social (active participation of the communities directly benefited) and the environmental (the sustainable management of natural spaces, with the purpose of preserving them for present and future generations). Argument that corroborates with such a statement is the recognition and encouragement of the PSAs market, both because of its economic performance and its social aspect (article 2, I). In addition, the legislation recognized the specificities inherent in the characteristics of the different biomes and the consequent need to adapt the methodologies of PES to the local context. In this way, alternatives such as REDD receive the support of PEPSA to make the imperative modifications, without detracting from the respective instruments, to be better applied in

Pernambuco (article 2, III).

In the same way, the policy defines as target spaces (article 2, II) those that the legal system itself considers as sensitive from the environmental point of view: areas of legal reserve (Federal Law 12. 651/12 - Forest Code), preservation (Federal Law No. 12. 651/12 - Forest Code), conservation areas (Federal Law 9985/00 - SNUC), of the areas susceptible to desertification (Federal Law 13. 153/15 National Policy to Combat Desertification and Mitigation of Effects (Federal Law no. 12. 651/12 - Forest Code), aquifer recharge zones and/or water supply (Federal Law 12. 651/12 - Forest Code).

As a result, PEPSA, at least in the context of legislation, pacifies the discussions on the so-called double institutional protection granted to these areas. The REDD contract, as well as other instruments provided for in the policy, is an alternative way to meet the carbon reduction and environmental protection goals. Thus, in addition to the classic use of “command and control”, which has the function of indicating legal and illegal behavior, economic instruments through the market or other means have been used. This is an innovative way in Environmental Law, since it allows the configuration of a kind of market that promotes private participation directly in the contribution to the legal effectiveness of the realization of the general public interest.

The PSAs integrate an economic interpretation of nature, insofar as they use market concepts, the idea of natural capital and producers of environmental services. They also use a cost-of-opportunity logic, monetarily assessing the situations of standing the forest. These are strategic instruments that can contribute to improving the legal effectiveness of environmental protection

This approach, however, at the same time as it innovates, is criticized for encouraging the commodification of nature and for emphasizing the possibility of a lack of environmental ethics in the economic treatment of natural resources. This interpretation can also be applied insofar as the culture and way of life of the peoples who use these natural resources also become negotiable if they are not expressly respected in the contract between the parties.

However, from a technical point of view, the notion has been built in the law that it is not a market of biodiversity, but a market of the legal obligation of compensation, since this was the demand created by the state, which requires compensation of carbon emissions. It thus becomes a

bond market, or a compensation market, instead of the commoditization of nature, as the main criticisms claim.

Another controversial point is the concept of additionality. For this to occur, there should be a difference in what would occur at the baseline or absence of the project (also called “business as usual”). If this difference did not exist, no such phenomenon occurred. The baseline is what happens in the absence of a REDD project, and additionality is the difference, compared to the baseline, corresponding to what is no longer emitted to the atmosphere with the project (FERENCZY, 2009). As Angelsen (2008) noted, for REDD to be effective, and consequently its goals are met, emissions reductions should be additional. Therefore, for the author, a “realistic presumption of what would happen without the REDD project” should be made (ANGELSEN, 2008).

Based on this argument of Angelsen (2008), Ferenczy (2009) understood that the areas of permanent preservation and legal reserves can not be considered spaces suitable for the development of REDD projects, since they consist of spaces that, by virtue of the law, can not be deforested, and therefore no additionality occurs if projects are developed in these spaces.

At this point, Karousakis (2009) noted that in order to effectively reduce emissions from deforestation and degradation, financial incentives should be directed to areas that are at risk of being converted to alternative land uses. It should be noted, however, that this identification of areas that are at risk does not necessarily imply the exclusion of protected areas, since REDD projects can be developed in protected areas that are being poorly managed, suffering from lack of resources and therefore, failing successfully to protect essential ecological processes. The additionality factor would therefore also be present in this situation (KAROUSAKIS, 2009).

Here, the International Union for Conservation of Nature (IUCN)

Currently, many protected areas are poorly managed or exist only on paper; these areas are included in national nature conservation statistics, but fail to provide the benefits generally associated with protected areas. Improving the effectiveness of protected areas thus becomes a key objective. (IUCN, 2010, p. 12)

However, to admit that any protected area does not suffer any kind of pressure, be it political, social or economic, is, in fact, to believe

in the full efficiency of governmental conservation laws and policies. Unfortunately, such a situation does not occur. The problems range from the lack of supervision to the lack of awareness of society itself. It is understood that the position of Karousakis (2009) is the most correct, considering that, with this, it would be possible to cover a greater number of territorial spaces and, moreover, directly involve the population.

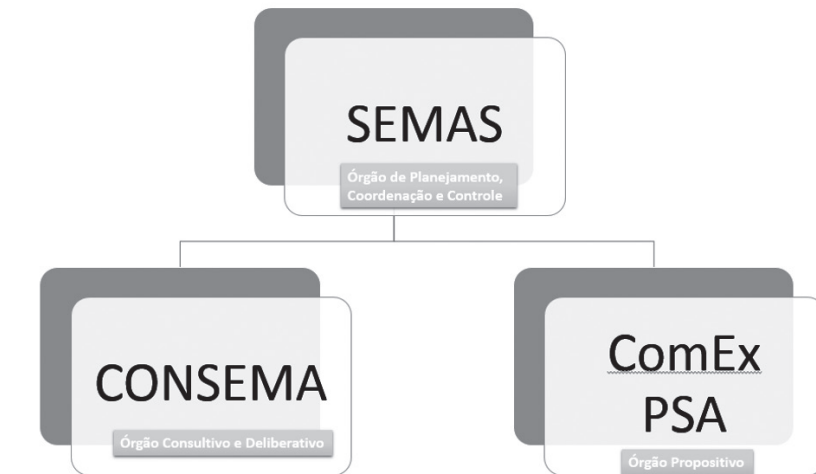
There is no doubt that the obligation to conserve should be fulfilled without requiring any kind of economic incentive; however, the results presented do not seem to be satisfactory, in what concerns the conservation of the Caatinga and Mata Atlântica (SOS MATA ATLÂNTICA, INPE 2015; PERNAMBUCO, 2011), and therefore a wider discussion about other alternatives to the PSAs.

In view of this situation, the legislator has assumed an explicit position regarding the areas that can receive REDD projects. According to article 13, paragraph 4, only the preserved areas beyond the minimum established by the national and state forest legislation, in addition to the permanent preservation areas and the compulsory legal reserve, and with voluntarily restricted use by means of forest easement, private reserve institution of natural heritage or legal reserve registration in addition to the legal minimum (PERNAMBUCO, 2016). Therefore, the legal system of Pernambuco adopted the position of Ferenczy (2009).

In order to achieve the proposed objectives, it was necessary to create a juridical and institutional framework (Figure 3) in which the definition of attributions for all the organs involved was clear. As an organ responsible for the state architecture in the environmental field and for its own attribution in SISNAMA and SISEMA, the function of planning, coordination and control of implementation is the State Department of Environment and Sustainability (SEMAS) (article 5).

SEMAS, as defined in the policy, also has the following competencies: (I) to monitor actions to comply with PEPSA guidelines; (II) articulate actions in different governmental institutions; (III) to support studies, research and actions; (IV) to make available and keep up to date the information about the areas covered by the PES projects, as well as the services provided by these areas and the amount perceived by the beneficiary as remuneration; (V) ensure the transparency and social control of PES programs, subprograms, action plans and projects; (VI) implement the registration of priority areas for PSA projects and (VII) approve normative acts aimed at disciplining actions.

Figure 3 - PEPSA institutional arrangement



Source: Prepared by the author.

It is clear from the normative provisions that, in conferring the above attributions, the legislator chose to create a true governing body in the implementation of PEPSA; however, it is important not to forget that, because of the principles of Environmental Law, such as information and popular participation, SEMAS does not have the absolute *ratio decidendi*, and its decisions can be reviewed automatically (*autotutela*) or even as a provocation to power the judiciary.

Due to its pioneering character in the legal order, as well as due to the existing gap in the environmental organization of the state, it was necessary to create a body with a propositional character that would act in harmony with the Secretariat of the Environment and that had as main characteristic the heterogeneous and interinstitutional composition of its participants, the so-called Executive Committee of the PSA state program (ComEx PSA).

The formation of this committee is regulated by Decree No. 43,128/2016 and comprises a representative and an alternate of the following organs: (I) Secretariat of Environment and Sustainability; (II) State Environmental Agency-CPRH; (III) Secretariat of Economic Development; (IV) Development Agency of Pernambuco-AD-DIPER; (V) State Agency for Water and Climate - APAC; (VI) Secretariat of Agriculture and Agrarian Reform; (VII) Instituto Agronômico de Pernambuco - IPA;

and (VIII) Secretariat of Science, Technology and Innovation.

The concern in the creation of this organ was to guarantee the participation of the different spheres of executive Public Power, taking into account basic organs of the economic field and environmental protection, as well as to include sectors of agriculture and science and innovation. The coordination of the committee is the responsibility of SEMAS. It should be noted that through coordination, it is possible to invite individuals and representatives of other institutions to participate in activities considered relevant for the fulfillment of their duties.

In this sense, as stated elsewhere, the ComEx PSA has a striking character as its propositional bias, considering that its main function is to define and propose to the State Council of Environment (CONSEMA) criteria and parameters for the implementation of the PSA, such as, for example, criteria of calculation and form of remuneration to be paid to providers, considering the importance of the environmental service provided, the extension of the area, the socioeconomic condition of the beneficiary, among other parameters defined in regulation (art. 6, II), and the technical and scientific parameters to be used in the evaluation and monitoring of environmental services that can be remunerated (article 6, IV).

The third body that participates in the institutional arrangement for implementing PEPSA is CONSEMA (article 7). It has a consultative and deliberative character, assuming a place of protagonism, since it is the board that is responsible for the analysis of the proposals created by ComEx PSA. According to PEPSA, CONSEMA has as its attributions: (I) to analyze and deliberate on the criteria and parameters defined by the Executive Committee for the PSA subprograms and projects; (II) approve the rendering of accounts of expenditures made by the State Fund for Payment for Environmental Services; and (III) to establish supplementary standards where necessary. It should be noted that the technical chambers of the CONSEMA may be convened to technically subsidize the deliberations of said council, as well as propose alternatives to improve the actions of implementation of the policy and the subprograms of PES.

This institutional trident is responsible for the implementation of the PEPSA and, for that, the instruments were also created to achieve the objectives set forth in art. 2º: (I) State Program of Payment for Environmental Services; (II) state registry of Priority Areas for PSA; (III) inventory of the state's natural capital; (IV) state system of information on

PES; (V) State Fund for Payment for Environmental Services.

The PSA State Program aims to implement the PES policy for the preservation, conservation and restoration of ecosystems, and to maintain and increase the supply of environmental and ecosystem services (rt. 9). This is a macro tool that houses five subprograms, which are: (I) PSA Restoration subprogram; (II) Subprogramme PSA Biodiversity; (III) PSA Subprogram Water; (IV) PSA Carbon Subprogram; (V) Subprogram PSA Beauty Scenic.

The subprograms are true lines of thematic actions that will mark the PSA contract, as well as its requirements. That is, the criteria for PSA Biodiversity and PSA Água, for example, are different and have different regulations; however, there is nothing to prevent it from being included in more than one subprogramme, provided that the requirements of both are fulfilled. Due to the objective of this research, only PSA Carbon will be analyzed.

The PSA Carbono subprogram is disciplined in art. 13 and supports projects aimed at reductions or sequestration of GHG emissions, carried out by those who develop actions to mitigate GHG emissions from (I) deforestation and degradation, as well as the maintenance and increase of forest carbon stocks (REDD +), (II) agriculture and livestock; (III) energy; (IV) transport; (V) industry; (VI) waste management. The institutional arrangement of PEPSA promote offsetting emissions from production activities through local arrangements, without prejudice to any agreements within the norms of conventional or voluntary markets (rt. 13, § 1). In this sense, priority will be given to projects involving traditional communities or populations, as well as those involving rural settlements.

Another defining criterion in the choice of recipient areas is the prioritization of those that, by technical and legal criteria, such as size, conservation *status* and use regime, are more restrictive in terms of conservation (Article 13, §2). Therefore, if there is only one resource to implement the PSA in only one space and there is more than one competition, the one that meets these characteristics alone or cumulatively will benefit.

In addition, there is a caveat regarding the eligible spaces. Only the preserved areas beyond the minimum established by the national and state forest legislation, in addition to the areas of permanent preservation and the legal reserve, and with voluntarily restricted use by means of forest easement, reserve institution, are eligible for the PSA Carbon Subprogram.

natural heritage or legal reserve registration in addition to the legal minimum (art. 13, §4º).

Another fence that occurs in relation to the PSA Carbon is the use of areas with forests planted with exotic species. Such exclusion serves to protect the native or recovering areas and to avoid that these spaces are deforested in order to instead plant species such as eucalyptus and pinus, both of which are fast growing. Thus, it avoids a stimulus to rampant planting these species in search of an alleged carbon sequestration of these spaces. However, as PEPSA's own objective preaches, the purpose of PEPSA lies in the maintenance of natural spaces together with the management and recovery of these.

Therefore, PEPSA demonstrates that there is a planned and structured environment not only for REDD implementation, but for any initiative that builds on the concept of PSA because, in addition to bringing clear implementation requirements, it brings with it eligibility criteria for projects to be included in the legal protection of the policy.

## CONCLUSION

Law is a key element in the process of utilization of natural resources, since it is capable of creating/legitimizing the institutional environment and coordinating mechanisms that enable peaceful coexistence between economic interests and the need for environmental preservation, not only with its sanctioning function, but, above all, when one takes a promotional stance (protector-receiver). In this sense, the Legal Sciences, together with the other fields of knowledge, have the role of structuring the mechanisms of PSA, in order to respect the ecosystem view and, at the same time, to adapt to the changes of the reality that surrounds it. This mutability of legal systems is evident in the protection of the Caatinga biome.

In this intonation, it is imperative that Pernambuco, through its governmental agencies, create a consistent legal environment, supporting these institutional variations and individual values, but at the same time, it allows the institution of mechanisms that adhere to the longings of that society. This basis, according to the logic of sustainable development, must be protection of the environment, and flexible and adaptable gears are the instruments that protect and promote social and economic aspects in a harmonious and systemic way.



This function is attributed to REDD, considering all the legal framework developed for its implementation in the state. From the definition of objectives to the creation of a favorable institutional arrangement, this system occupies a gap not only in the legal sphere, but also in the reality that was once characterized by the lack of effectiveness of the command and control instruments.

Thus, given this scenario, REDD emerges as a very useful tool to bring improvements not only in the *environmental* sphere, but also to demand an environmentally correct posture of the whole society. Its foundation is based not only on state legal provisions, but also on national guidelines and international conventions/treaties. Therefore, from the legal point of view, the mechanism can be implemented in Pernambuco for the conservation of the Caatinga.

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