

CLIMATE CHANGE AND PROJECTS OF ENVIRONMENTAL SERVICES IN INDIGENOUS LANDS OF STATE OF AMAZONAS^{1,2}

Serguei Aily Franco de Camargo³

State University of Roraima (UERR) |

Plínio Henrique Oliveira Gomide⁴

State University of Roraima (UERR) |

Tháisa Rodrigues Lustosa de Camargo⁵

Public Ministry of the State of Amazonas |

ABSTRACT

Due to the 2005 drought in Brazil's Amazon region, in the state of Amazonas, enacted the Law 3,135/2007, which established the state policy on climate change. The text provided ways of promoting sustainable development, maintaining climatic conditions and determining incentives for the participation of both the population and the public power in environmental protection. However, about 10 years after its enactment, the law seems to have fallen into disuse due to two main reasons: the dismantling of the state structure that was implementing its instruments; and the lack of complementary regulation. Years later, Amazonas enacted Law 4,266/2015, which established the State Environmental Services Management System, and created the State Fund for Climate Change and amended Laws 3,135/2007 and 3,184/2007, which also alters the Law 3,135. This study aimed to evaluate the interaction among all these norms, through an exercise of interpretation, in order to verify

1 Research funded by National Postdoctoral Program (PNPD) from the Coordination for the Improvement of Higher Education Personnel (CAPES) between 2016/17.

2 The authors are grateful for the support of CAPES and the Graduate Program in Agroecology at the State University of Roraima (UERR). They also thank the anonymous referees for their important contributions to the text originally submitted.

3 Post-Doctorate in Applied Social Sciences at the University of Campinas (UNICAMP). Post-Doctorate in Environmental Law at the São Paulo State University Júlio de Mesquita Filho (UNESP). Post-Doctorate in Biological Sciences at UNICAMP. PhD in Aquaculture from UNESP. Master in Conservation and Resource Management from UNESP. Graduated in Law from UNESP. Professor at UERR. ORCID: <http://orcid.org/0000-0003-1899-2311> / e-mail: sergueiaily@mpr.mp.br

4 PhD in Soil Science from the Federal University of Lavras (UFLA). Master in Soil Science from UFLA. Graduation in Agronomy from UFLA. Professor at UERR. ORCID: <http://orcid.org/0000-0002-2545-8195> / e-mail: pliniogomide@gmail.com

5 PhD in Environmental Sciences and Sustainability in the Amazon from Federal University of Amazonas (UFAM). Master in Environmental Law from State University of Amazonas (UEA). Specialist in Labor Law and Process and by Anhanguera University (UNIDERP) and in Educational Research by UEA. Law degree from UEA. Legal Advisor to the Public Ministry of the State of Amazonas. ORCID: <http://orcid.org/0000-0001-8800-6260> / e-mail: tatarlustosa@yahoo.com.br

their socio-environmental effectiveness. We concluded that the participation of both traditional communities in conservation units of sustainable use and indigenous peoples on their own lands provides partial effectiveness to Law 3,135/2007, as it allows the implementation of projects that reduce emissions caused by deforestation and degradation in protected areas. In addition, it enables the payment of rewards to environmental service providers.

Keywords: Climate changes; Indigenous lands; State Law of Amazonas 3,135/2007; State Law of Amazonas 4,266/2015; Sustainable Use Conservation Units.

MUDANÇAS CLIMÁTICAS E PROJETOS DE PRESTAÇÃO DE SERVIÇOS AMBIENTAIS EM TERRAS INDÍGENAS NO AMAZONAS

RESUMO

Devido à seca de 2005, o Amazonas editou a Lei n. 3.135, de 05 de junho de 2007, que instituiu a Política Estadual sobre Mudanças Climáticas. O texto previu formas de promoção do desenvolvimento sustentável, de manutenção das condições climáticas e incentivos à participação da população e do Estado na tutela ambiental. Entretanto, cerca de 10 anos após sua edição, a lei parece ter caído em desuso. Parte da ineficácia se deve ao desmantelamento da estrutura de Estado que atuava na implementação de seus instrumentos e parte, em virtude da falta de regulamentação complementar. Anos depois, o Amazonas editou a Lei n. 4.266, de 01 de dezembro de 2015, que instituiu o sistema de gestão de serviços ambientais no estado, criou o Fundo Estadual de Mudanças Climáticas e alterou as leis n. 3.135/2007 e 3.184 de 13 de novembro de 2007, que por sua vez, também altera a Lei n. 3.135/2007. Pretende-se assim, avaliar a interação entre todas essas normas, em um amplo exercício de interpretação, com o objetivo de constatar sua eficácia socio-ambiental. Concluiu-se que a participação das comunidades tradicionais em unidades de conservação de uso sustentável e dos povos indígenas em suas terras, enseja eficácia parcial à Lei 3.135/2007, ao permitir a implementação de projetos de redução das emissões por desmatamento e degradação nessas áreas protegidas, possibilitando o pagamento de recompensas aos prestadores de serviços ambientais.

Palavras-chave: *Lei Estadual do Amazonas n. 3.135/2007; Lei Estadual do Amazonas n. 4.266/2015; mudanças climáticas; terras indígenas; Unidades de Conservação de Uso Sustentável.*

INTRODUCTION

The people who live in the state of Amazonas, Brazil, became perplexed after the great drought of 2005 and for this reason they stimulated discussions about the effects of climate changes in the state. In response to this climatic setback, the state enacted the Law 3,135/2007, which instituted the State Policy on Climate Change, Environmental Conservation and Sustainable Development of Amazonas, or simply the state policy on climate change.

This policy was pioneer on the subject in Brazil, as it anticipated many instruments and mechanisms to promote the state's development, always seeking to reduce greenhouse gas (GHG) emissions. Thus, Amazonas became an internationally known example of commitment to the common future and, at the same time, a potential carbon reserve to be protected and disputed (VIANA, 2008). In this context, clean development mechanisms became a feasible alternative, depending, however, on a broad political and institutional articulation to promote the regulation of the law, giving it full effectiveness.

In 2011, there were discussions on a state policy for environmental services in Amazonas, whose results were implemented by the state Law 4,266/2015. This law also instituted the management system for environmental services, created the State Fund for Climate Change, Environmental Conservation and Environmental Services. In addition it changed the state Laws 3,135/2007 and 3,184/2007. The latter authorized the state to participate in a single private foundation, with the aim of promoting programs and projects on climate change, environmental conservation and sustainable development.

However, in 2017, ten years after the enactment of Law 3,135/2007, its regulation did not come about. On the contrary as political priorities changed, there was a dismantlement of the entire institutional structure of support to the state of Amazonas and to the instruments provided by the law. It was a transversal system distributed between the Secretariat for Sustainable Development (SDS) and the State Secretariat for Science, Technology and Innovation (SECTI).

Nevertheless, even in an unfavorable scenario, in which regional, social, political and institutional actors have tended to believe in the normative ineffectiveness of Law 4,266/2015, an indirect opportunity emerged for indigenous peoples. They became able to build in their lands

management projects of environmental services aimed at reducing gas emissions resulting from deforestation and degradation within the scope of the norm. Thus, we intended to present through a broad exercise of interpretation of the federal and state environmental regulatory milestone the possibilities of a new path for sustainable regional development, giving partial effectiveness to the state Law 3,135/2007 (which had already been updated by the Law 3,184/2007) by the law 4,266/2015.

Methodologically we built this research on a scarce bibliographic base, as it mainly refers to regional and little studied legal instruments. In this regard we highlight the importance of Roessing Neto (2009) which was the only specific study on the state laws in question. Additionally, we carried out a search on the CAPES Journal Portal (only within the scope of free access), which in September 2019, presented the following results: i) for the expression “climate change and indigenous lands” we obtained a total of 36 articles, all in peer-reviewed journals, from 2005 to 2018; and ii) for the expression “climate change and Amazonas” we obtained 83 articles, also in peer-reviewed journals, from 2005 to 2019. Among the selected articles, only ten had any superficial relation with the addressed theme.

In the sequence we examine the aforementioned state legislation in more detail, addressing state institutional aspects, the importance of conservation units, of indigenous lands and their traditional populations for sustainable development. In the end we seek legal justifications for any payments for the provision of services for the implementation of forest protection projects on indigenous lands.

1 THE STATE OF AMAZONAS AND THE ORIGIN OF CONCERN WITH CLIMATE CHANGE

According to the Amazonas state government portal (2019), the state has about 1.5 million km², 16% of the earth’s freshwater reserves, a forested area comprising 98% of its territory and a large part of carbon stocks in Brazil. The estimated population for the state in 2016 reached about 4,001,667 people, with 168,880 indigenous people from 65 different ethnic groups Depending on the (Brazilian Institute of Geography and Statistics [IBGE] 2010). Still according to the Amazonas state government portal (2019), the main economic foundation of the state is the Manaus industrial pole. On this matter, the State Government itself affirms that this development model contributes to minimize the pressure of deforestation

in Amazonas, due to replacing intensive land use with an industrial based economy.

Despite the pattern described above, it is known that the arc of deforestation, resulting from the expansion of the agricultural frontier, is close to the state of Amazonas, mainly in the municipalities of Boca do Acre and Apuí (YOUNG et al., 2007 apud ROESSING NETO, 2009). However, according to Bezerra (2012), deforestation in the Amazon is unstable, which makes predictions difficult, despite the strong relationship between environmental degradation and countries with weak institutional structures.

The described scenario is worrying because, according to Fearnside (2004), the Amazon rainforest plays an important role as a climate regulator in the Southern Cone of South America, or the region immediately below the Tropic of Capricorn, which is responsible for a significant part of the rain in the center-south of Brazil, Argentina, Uruguay and Paraguay. Seemingly, the impacts of deforestation can compromise large, highly profitable agricultural areas. And we may add to this context that the main source of GHG emissions in Brazil, is exactly the burning of forests (SOARES; HIGUCHI, 2006).

Demographically, the state of Amazonas is peculiar. Its countryside presents low density whereas in the capital it is high. Thus, according to IBGE (2010), most of the state's population is concentrated in its capital (Manaus), whose population reached approximately 1,560,000 people in 2010, distributed over an area of 11,401,092 km², thus making up a demographic density of 136 inhab/km².

Thus, we might ask why became Amazonas concerned about protecting its environment and minimizing climate change within a context of water and forest resources abundance and low population perception of its impacts? According to Serrao et al. (2015), the decisive factor encouraging discussion and subsequent legislative production on climate change in the state of Amazonas was the great drought of 2005. The author states that at that time there was a reduction in rainfall of 8.47%, 27.86% and 29.94% in the months of May, June and July respectively in relation to the previous year has constituted a record drought. The calamity was installed inside the state, as there was high fish mortality and damage to agriculture, associated with the isolation of many communities, which forced a joint military operation to distribute food and medicine to the affected population (ROESSING NETO, 2009).

According to Roessing Neto (2009), the drought was related to the

greenhouse effect, the temperature increase in the Atlantic and with the increase in ground-clearing fires. However, among the causes of climate change in Amazonas, there are not only the effects of global warming, but also regional socioeconomic changes caused by population density (according to Table 1, adapted from IBGE, 2010).

Table 1 Manaus population growth

Census	Population	%±
1872	29334	
1890	38720	32,0%
1900	50300	29,9%
1920	75704	50,5%
1940	106399	40,5%
1950	139620	31,2%
1960	175343	25,6%
1970	314197	79,2%
1980	642492	104,5%
1991	1010544	57,3%
2000	1403796	38,9%
2010	1802014	28,4%
Est. 2016	2094391	49,2%

Source: IBGE demographic censuses from 1872 to 2010 (IBGE, 2010).

The demographic explosion in Manaus generated social and economic problems, since a large part of the excess population settled on the outskirts of the city, widening its borders, occupying valleys, swamps, wetlands, private green areas and areas of environmental protection. Due to the deforestation resulting from these effects, there was an increase in CO₂ emissions and changes in the region's climate. Such events ended up constituting a milestone in the discussions on climate change in Amazonas, which, in June 2007, resulted in the enactment of Law n. 3,135, whose analysis follows.

2 COMMENTS ON LAW 3,135 OF JUNE 5, 2007 FROM THE STATE OF AMAZONAS

State Law 3,135/2007 considered and recognized the importance of forest conservation as a way to avoid the harmful effects of global climate change and to promote the sustainable development of the economy, environment, technology and quality of life of current and future generations. Thus, this law was based on the following principles of environmental law, all expressed in its Article 1, Paragraph II: prevention, precaution,

common responsibilities, sustainable development, participation and national and international cooperation.

For the State Policy on Climate Change to be effective in promoting its objectives, guidelines, actions and programs, the aforementioned law had economic, financial and fiscal instruments. Among the main instruments, there was prevision to fund and create market mechanisms to enable the execution of projects for reducing emissions from deforestation (RED), clean energy (CE), in addition to net GHG emissions, whether inside or outside the Clean Development Mechanism (CDM) of the Kyoto Protocol.

The law contemplates the importance of stimulating voluntary projects aimed at the use of the CDM and other mechanisms and/or certified carbon credit market regimes that effectively contribute to the concentration stabilization of greenhouse gases. For this reason, it also provides for a series of activities and measures to enable the sustainable development of the state, based on inventories of emissions and biodiversity. The law also offers the possibility of funding the development and exchange of replicable initiatives regarding the creation of technologies that allow the net reduction of GHG, and enable CDM and RED projects.

As a complementary, but no less important activity, the law mentions the promotion of environmental education on the impacts and consequences of climate change to traditional needy communities and public school students, through courses, printed material and the Internet. Such actions would also provide the population of Amazonas with awareness about global warming.

The legislation also allows and encourages the elaboration of plans of action that contribute to mitigate adverse effects of climate change as well as the creation of certified seals to award public and private entities that develop projects in the scope of climate change, environmental conservation and sustainable development in the state of Amazonas. Such seals have also stimulated the creation of different projects aimed both at reducing emissions from deforestation and net greenhouse gases. In addition, they helped establishing incentive instruments to make their execution feasible. Article 5 of the law provide a total of seven programs created, as follows: (I) State Educational Program on Climate Change; (II) Grant Forest Program; (III) State Environmental Monitoring Program; (IV) State Environmental Protection Program; (V) State Program for the Exchange of Clean and Environmentally Responsible Technologies; (VI) State Training Program for Public Bodies and Private Institutions; and (VII) State Incentive Program for the Use of Clean Alternative Energy and Reducing Emissions

of Greenhouse Gases.

Finally, the law provides for the implementation of research projects in Conservation Units (CU's), basically using the state's science, technology and innovation system, especially through the Research Foundation of the State of Amazonas (FAPEAM). In addition there is the creation of new CU's and the institution of indicators or zones that show areas of greatest vulnerability to climate change within the scope of the Ecological Economic Zoning.

We highlight that despite this policy is statewide, it generates international impacts, as it places Amazonas as a specially protected territorial space with a view to reducing GHG emissions in a larger scope. Thus, it presents the necessary interface with the Amazon Cooperation Treaty (TCA), established in 1978 by the parties (Brazil, Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela) as a guideline for sustainable development of the entire basin (BRASIL, 2017).

The Amazonian law considers the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, in addition to decisions issued in consonance with Amazonas documents, such as the State Policy on Climate Change, Environmental Conservation and Sustainable Development of the State. It also highlights the social, economic and environmental impacts of climate change and its expected effects, especially for the Amazon Forest, in addition to the decision of the Government of the State The state Law no. 3,135/2007 still today is innovative legislation, not only because it serves as a model for Brazil, (that only published its National Policy on Climate Change, compounded in Law 12,187 on December 29, 2009), but also for encouraging companies to reduce pollutant gas emissions, penalizing those that do not comply with the aforementioned legislation. However, we can observe in it not just its repressive character, but mainly its preventive one, as its aim is the conservation of the largest tropical forest in the world, providing means to maintain the balance of regional ecosystems in the face of climate changes resulting from global warming.

3 COMMENTS ON LAW No. 4,266 OF DECEMBER 1, 2015, FROM THE STATE OF AMAZONAS

State Law no. 4,266/2015, instituted the Amazonas State Policy on Environmental Services and the Environmental Services Management System, created the State Fund for Climate Change, Environmental

Conservation and Environmental Services, amends State Laws no. 3,135/2007 and 3,184/2007, and takes other measures. In its article 2, brings a series of definitions of interest to the subject, with emphasis on the Items II and XXVIII, Subitens a, b, c, d, in the following terms:

II – environmental service agents: all individuals or legal entities that contribute, develop, promote, use, regulate, execute and invest in activities that benefit maintenance, integrity or improve and recover functions and processes that generate environmental services;

[...]

XXVIII – Environmental or ecosystem services: relevant ecological processes and functions generated by ecosystems, in terms of maintaining, recovering or improving environmental conditions, for the benefit of the well-being of all human societies and the planet, in the following modalities:

a) provision services: they are related to the capacity of ecosystems to provide goods, be they food (fruits, roots, fish, hunt, honey); raw material for energy generation (firewood, coal, waste, oils); fibers (wood, ropes, textiles); phytopharmaceuticals; genetic and biochemical resources; ornamental plants and water;

b) support services: these are the natural processes necessary for the existence of other services, such as nutrient cycling, waste decomposition, primary production, maintenance or renewal of soil fertility, pollination, seed dispersal, the control of populations of potential pests and potential vectors of human diseases, protection against ultraviolet solar radiation, the maintenance of biodiversity and genetic heritage, among others that maintain the continuity of life on Earth;

c) regulation services: these are the benefits obtained from natural processes that regulate the environmental conditions supporting human life, such as air purification, climate regulation, purification and regulation of water cycles, flood and erosion control ; waste treatment, detoxification and pest and disease control;

d) cultural services: those that provide immaterial, educational, recreational, aesthetic and spiritual benefits; (emphasis added)

We observe that Item II presents the agent of environmental services as the natural or legal person who improves and/or recovers the processes that generate environmental services, while Item XXVIII places environmental services as a synonym for ecosystems. This apparent redundancy demonstrates the terminological imprecision of the legal text, since it does not bring about the fundamental differentiation between ecosystem services and environmental services.

Despite the fact that there is still no doctrinal consensus on the issue, it is necessary to differentiate between the terms, for the feasibility of providing environmental services. Thus, there are two distinct objects: environmental services, as a voluntary human action in favor of ecosystem

services, which are ecological, systemic processes and their reflexes for the benefit of man himself. Thus, we can observe it in Camargo's reflection (2015, p. 05):

Environmental services and ecosystem services are terms that designate different theoretical objects, since these are the services provided free by the environment for the benefit of society, while environmental services are provided by man, for the benefit of ecosystems. Thus, any natural or legal person who directly protects, maintains, preserves, conserves or manages a natural good or an ecosystem, which is a provider of ecosystem services, is an environmental service provider.

From this point of view, considering environmental services as an effective provision of services by an individual or legal entity, it is necessary to improve and/or recover by human action a process that generates any ecological function, it differs profoundly from the benefited ecosystem service, which, *a priori*, has no direct relationship with the voluntary action of the agent (whether an individual or a legal entity).

Additionally, Camargo (2015 p. 05) explains that the protector-recipient principle is the legal foundation that supports the reward for agents providing environmental services, *in verbis*:

Based on the protector-recipient principle, this provider may be rewarded for the environmental service itself, not for the ecosystem services resulting from it. This reward can be given through different economic instruments, such as incentives or payments, in compensation systems for environmental services, with the beneficiaries being incentives / payers defined by law or contract. Such systems, however, are not to be confused with the well-known payment schemes for environmental services – PSA, since those are the genus of which the PSA is only a subspecies, which is only configured when there is additionality and voluntariness in the provision of environmental services. In this way, several existing compensation systems that are called payment for environmental services, in fact, correspond to other types of compensation, which is not payment, or compensate / reciprocate activities that cannot be considered as environmental services. This is what happens, specifically, with the three cases of the Brazilian Amazon analyzed: the Grant Green program of the federal government, the Grant Forest of the State of Amazonas and the PSA of sport fishing in the city of Barcelos, state of Amazonas. This conceptual impropriety has important practical consequences, such as the possibility of accessing funds for environmental protection through programs that, in general, are merely income transfer policies. Thus, it turns out that the major issue is not legal, but of concept, as the legislation put in place is already capable of regulating the issue.

From this perspective, Camargo (2015) still presents the different types of environmental services, being the classification as to the nature of the provision of the environmental service that is relevant to this work.

According to the author, environmental services can be characterized by (I) an increase in positive externalities or (II) by a reduction in negative externalities through mitigation or substitution.

The increase in positive externalities would be due to protection services (conservation or maintenance) and recovery, such as the creation of conservation units (protection service) and the recovery of degraded permanent preservation areas or legal reserves (recovery). On the other hand, the replacement would be the use of artificial or semi-natural systems to perform functions equivalent to that of ecosystem services, such as the cleansing of water from a river. Mitigation, on the other hand, would be the environmental service that leads to changes in the practice of managing ecosystems or resources, thus reducing the impact on ecosystems or their demand for ecosystem services. According to the classification of environmental services proposed by Camargo (2015), it appears that the reduction of emissions from deforestation and forest degradation (REDD) would be an environmental service to reduce negative externalities through mitigation or substitution.

An important consideration remains about environmental services and their respective payments or rewards. These services must be voluntary, featuring a plus, or an additionality, going beyond the minimum obligations established by law. Volunteers, because you cannot reward someone for simply complying with the law, for example: the Forest Code (Law 12,651/2012) establishes the obligation to maintain areas of legal reserve and permanent preservation areas; the rural owner who simply complies with legal requirements would not be entitled to receive a reward for avoided deforestation on his property (BRASIL, 2012a). On the other hand, if the law establishes a minimum percentage of plant cover to be maintained in that biome and, voluntarily, the rural owner preserves an upper area, characterizing a plus to the legal determination, he would then be entitled to receive a payment for the environmental service provided, since by extrapolating the legal minimum, it added greater efficiency in maintaining ecosystem services.

4 INSTITUTIONAL ASPECTS AND LEGAL BARRIERS

In order to operationalize the legal dictates previously mentioned, making the law more effective, the state of Amazonas had a very peculiar and positive administrative structure. In 2007, by the time of the law's

enactment, there were two state secretariats and some internal bodies that directly took care of the promotion of research, technology development and innovation. In addition, there were centers to deal with the creation and management of state CU's and public policies aimed at reduction of GHG emissions and other activities related to minimizing the effects of climate change. In what regards funding, there was the SECTI, which was linked to FAPEAM, as a financing agency in a primarily induced demand model. On another front we could observe the SDS, the State Center for Conservation Units (CEUC) and the State Center for Climate Change (CECLIMA).

Surprisingly, in March 2015 the Amazonas state governor adopted a series of measures, when defining an administrative reform that profoundly impacted the whole system, and was described by Greenpeace Brasil (2015) as disastrous. Greenpeace argued that the reform extinguished the SECTI, which was considered strategic. The CEUC, responsible for managing 42 state environmental protection areas and the CECLIMA were also extinguished. In addition the administrative reform resulted in a reduction in the budget and staff of the SDS, seriously compromising the fight against deforestation.

According to Greenpeace Brasil (2015), the government of the state of Amazonas interrupted the traditional posture of protecting the environment, which was characterized by a bold policy of creating and managing state CU's, in addition to serving social and economic purposes through land tenure regularization. This helped form a large carbon reservoir, contributing to the reduction of pressure for deforestation and also enabling the implementation of RED projects by traditional populations.

This situation reveals an opportunity that the referred legislation opened for traditional populations and that still remains little debated by the literature. It is because despite making the law widely effective, the implementation of RED projects runs away from the state's command and control mechanisms, placing traditional populations on a leading role regarding socio-environmental actions. Santos (2013) mentions that in the states of Acre and Amazonas there was a great movement towards the creation of sustainable use CU's, with the main objective of curbing deforestation. In this respect, the author indicates that the rubber tappers of Acre played an important role in the struggle for land, whereas in Amazonas, the riverside dwellers fought for the preservation of lowland lakes and fishing resources. In this context, we observe that 81.41% of the CU's created in Amazonas, which totals 18,808,342.60 ha belong to the

category of sustainable use category, mainly in the form of Sustainable Development Reserves (SDR).

Therefore, the demand for land is closely related to the protagonism of these traditional populations, which are now benefiting from the creation of several CU's for sustainable use. According to the National System of Conservation Units (SNUC), created by Law 9,985 of July 18, 2000, one of the main functions of sustainable use CU's is to guarantee the traditional way of life of these populations, normally characterized by sustainability, high dependence on natural resources, use of rudimentary technologies and in low scale (DIEGUES, 1999). Therefore, the pressure for deforestation in these areas is naturally lower, maintaining environmental health and favoring the balance of ecosystem services. According to Becker (2010) in recent times, the functions of ecosystems have come to be valued economically through environmental services. This allowed the creation of mechanisms to reduce emissions coming from deforestation and degradation, which would involve the development of a national strategy for such mechanisms, the implementation of national policies for the commercialization of carbon credits, until reaching the stage of payment for effective emission reductions.

Thus, despite observing institutional barriers that compromise the effectiveness of the norm, this legislation also the opportunity for traditional indigenous and non-indigenous populations to voluntarily contribute to reduction of GHG emissions by engaging in REDD projects in CU's of sustainable use in indigenous lands. However, nature CU's, established by Law by Law no. 9,985/2000 provides for two categories of conservation units: sustainable use and full protection. The full protection units, by their own destination and permission only for the indirect use of their natural resources, would not give rise to the payment/receipt of rewards for reducing the pressure for deforestation, precisely because it does not characterize the voluntariness or plus in the provision of a service, even if it is performed by a legal entity in the management of that unit. Note that in this regard, there is no voluntariness even in the act of creating conservation units, as in accordance with article 225, Paragraph 1, I, II, III, VIII, of the Brazilian Federal Constitution. It is the duty of the Public Power to protect the ecosystem and its processes, in addition to biodiversity and genetic heritage. To achieve this goal it is necessary to establish protected areas or CU's. It is possible to do so purpose by using vacant land. Thus, based on the assumption that Article 225 contains a fundamental right, there is

no margin for the state's discretion, which must protect the ecologically balanced environment for current and future generations.

It should be noted that the integral protection units, provided for in article 7, Paragraph 1, of Law 9,985/2000, are intended to "preserve nature, with only the indirect use of its natural resources being permitted, except in the cases provided for in this Law". Such exceptions are measures aimed at the regeneration of ecosystems impacted in some way. Therefore, there would also be no voluntariness, since the manager of the conservation unit, normally in the public domain, would be bound by mere compliance with the law.

The opportunity in this spatial category resides in units of direct and sustainable use, mainly (but not exclusively) in extractive reserves (ER) and sustainable development reserves (SDR), both under article 14 of Law 9,985/2000. RESEX, as provided in article 18 of the law, permits the sustainable exploitation and/or management of natural resources by traditional populations, based on a management plan. We also note, in Paragraph 7 of the same article, that forest management will only be admitted on a sustainable basis, and should be complementary to the other activities developed at each RESEX. In any case, as mentioned, all activities carried out inside the unit are subject to the management plan, which shall be elaborated with the participation of traditional communities, which after approval by the deliberative council bind the residents of the area. In this respect, there is again some doubt regarding the characterization of the voluntariness of any environmental service provided by residents. Thus, a situation is configured in which, although management is allowed, it would not be mandatory. This situation leads to positive and additional results in the conservation of the environment, with favorable repercussions on the maintenance and increase of ecosystem services. In such cases, therefore, such services should be measured and rewarded proportionately.

There is no difference considering the SDR. The greatest peculiarity in this type of unit is related to the needless expropriation of all areas covered in the act of creation. The SDR is compatible with private property, provided that the activities carried out by landowners within it are compatible with the management plan. Again, there is a need to consider the voluntariness and additionality of environmental services provided there, in order to result in the right to a reward.

It is important to note that the Amazonian law, by encouraging mechanisms to reduce emissions from deforestation and degradation, opened an interesting opportunity for the integration of the state system of CU's

into the carbon credit market. As previously highlighted, the articulation between the management of CU's in the state of Amazonas and the effective implementation of projects to reduce emissions from deforestation and degradation depends on an active institutional state system, including the participation of traditional communities. Therefore, even in such a state system, the dismantling of public bodies like CEUC and CECLIMA, the contingency and/or budget reduction imposed to the SDS, in addition to human resource restrictions, can lead to the socio-environmental ineffectiveness of the current legislation. However, there is still a nice opportunity beyond the system to make the norm and indigenous lands effective, as described in the next item.

5 REDD AND INDIGENOUS LANDS

According to Benjamin (2000), Law 9985/2000 defines two families of CU's: those of integral protection and those of sustainable use. The author also affirms that the legislation is exemplary, allowing the inclusion of other types of protected areas in the system, such as indigenous lands, and the biosphere reserve. Such position is quite opportune, as it brings indigenous lands closer to sustainable use units, allowing a certain similarity of intentions, which would give rise to some limitations to the indigenous people's use of their own lands. Such limitations should lead environmental management in indigenous lands to sustainability, seeking to make ethnodevelopment compatible, as recommended by 169 of the International Labor Organization (ILO), with the achievement of the fundamental right to an ecologically balanced environment.

In this context, the development of REDD projects in indigenous lands emerges as a viable alternative. According to Santilli (2010), Brazil has 110 million hectares of indigenous lands, which corresponds to 13% of the national territory; in addition, 98% of these lands are located in the Brazilian Legal Amazon, representing 22% of the region's territorial extension. The other protected areas that are part of the SNUC, also located in the Legal Amazon, add up to a total area of approximately 13 million hectares, or 15% of the region, with 3% of the extension of the system overlapping 7% of indigenous lands. Finally, the author highlights that deforestation on indigenous lands in the Amazon is low, reaching about 2% of the total extension as a result of plantations, villages and areas previously degraded by non-indigenous possessions.

Corroborating the previous information, Dourado et al. (2016) argue

that between 2004 and 2006, the expansion of indigenous lands and CU'S in the Amazon was of approximately 24 million hectares, promoting a deforestation reduction of 37%. This allows us to infer that indigenous lands are important to ensure climate change mitigation actions, especially at the regional level.

Thus, Santilli (2010) states that the main goal of the development of the REDD projects in indigenous lands is to prevent the pattern of deforestation observed outside these areas from being repeated inside. It is worth remembering, however, that the state of Amazonas own development model contributes to the success of such projects, as the Manaus Industrial Pole continues to play an important role as a population and economic attractor to the capital, indirectly protecting the interior of the state (BECKER, 2010).

The large concentration of indigenous lands in the Amazon region can also, according to Santilli (2010), serve as a barrier to the arc of deforestation (among eastern Pará, northern Mato Grosso and central Rondônia states). Such areas should be prioritized for the implementation of REDD projects, as they are in the region of greatest pressure of deforestation in Northern Brazil. Table 2 presents data on the approximate carbon stocks existing in 12 indigenous lands in the Amazon.

Table 2 Aerial biomass carbon in indigenous lands in the Brazilian Legal Amazon

Indigenous land	Area (ha)		tC/ha		Total carbon (t)	
	Carneiro, A. 2009	Saatchi et al. 2009	Carneiro, A. 2009	Saatchi et al. 2009	Carneiro, A. 2009	Saatchi et al. 2009
Yanomami	9,589,302	1,432,598,612	1,057,057,107	111	1,432,598,612	1,057,057,107
Vale do Javari	8,561,824	1,264,825,726	1,115,596,131	131	1,264,825,726	1,115,596,131
Alto Rio Negro	8,034,176	1,201,268,666	997,494,125	125	1,201,268,666	997,494,125
Menkragnoti	4,928,083	694,721,947	397,510,659	81	694,721,947	397,510,659
Trombetas/Mapuera	4,002,902	619,695,304	533,986,516	134	619,695,304	533,986,516
Kayapó	3,307,878	407,685,159	276,689,280	84	407,685,159	276,689,280
Waimiri-Atroari	2,602,964	392,191,734	386,105,488	149	392,191,734	386,105,488
Tumucumaque	3,069,940	386,346,228	357,213,753	117	386,346,228	357,213,753
Mundurucu	2,397,454	256,179,665	255,441,207	107	256,179,665	255,441,207
Xingu	2,646,405	234,674,949	181,892,004	69	234,674,949	181,892,004
Alto Rio Guamá	280,416	42,788,995	33,499,680	120	42,788,995	33,499,680
Sete de Setembro	244,196	36,285,040	25,781,850	106	36,285,040	25,781,850
				Grand Total	6,969,262,025	5,618,267,800

Source: Santilli (2010, p. 15).

According to Santilli (2010), if hypothetically the indigenous people decided to remove 20% of the forests from their lands, which is possible by inserting the limits of usufruct in the context of the new Forest Code (Law 12,651/2012), that would result in future emissions of 2.8 GtC, which represents 460% of the total volume of emissions that Brazil intends to reduce by 2020. This clearly indicates the importance of not only maintaining environmental management in these areas, but also implementing projects of environmental REDD services as a way to reduce the pressure for deforestation. Such providences would furnish viable economic alternatives to indigenous people, who could opt for voluntary actions to maintain protected areas greater than the limits established in environmental legislation. In that case, they would be entitled to proportional rewards for environmental services provided, in addition to the foreign exchange revenues from the sale of carbon credits.

5.1 Indigenous Lands and Environmental Management

In a succinct manner, it should be noted that the eventual implementation of environmental REDD service projects in indigenous lands would meet the objectives advocated by Decree no. 7,747 of June 5, 2012, which institutes the National Policy for Territorial and Environmental Management of Indigenous Lands (PNGATI) (BRASIL, 2012b). The said decree is in accordance with the Convention 169 of the International Labor Organization (ILO), reaffirming the role of indigenous peoples and their empowerment in view of ethnodevelopment based on self-determination. Such diplomas also reaffirm the autonomy of indigenous peoples, in the daily exercise of usufruct over their lands. However they impose some limits. As mentioned above, indigenous lands can be considered conservation units for sustainable use outside the system (BENJAMIN, 2000). Thus, a plan for environmental management plan to such lands could provide instruments for environmental protection, which at the same time would allow the practice of clean development mechanisms, such as REDD projects.

Although Decree 7,747/2012 provide for ethno-mapping and ethno-zoning as substrates of the environmental management plan, i.e., despite guaranteeing the participation of indigenous communities in the preparation of such plans (BRASIL, 2012b), according to Oliveira and Tsamaren (2017), there are different internal intricacies (culturally and institutionally established), until effective decision-making. It is also important to note

that indigenous peoples have their own temporality, which may end up bringing ineffectiveness to legal provisions, when pressed for the economic use of their lands in the traditional way (such as agriculture and livestock). Unfortunately, immediateness does not spare traditional populations, also influenced by expectations of short-term gains.

Thus, a small warning becomes necessary: proposals for the implementation of REDD projects must be brought to the indigenous peoples, causing the internal decision-making bodies to appreciate them in a participatory manner, along the lines of the previous consultation instituted in Convention 169 of the ILO.

CONCLUSION

We verify that in this case the rescue of the norm's effectiveness occurred by indirect ways. As we could observe, the Amazonas legislation, when adopting the principles of precaution and prevention opened up numerous possibilities for implementing environmental protection projects, whether they are on indigenous lands or not. In a context of reduction of deforestation and greenhouse gas emissions, the advantages for indigenous lands comes from the biotic integrity of the systems, the large protected areas, and the large carbon stocks available. However, the most important of all are their strategic location, as an effective way to contain the arc of deforestation coupled with the empowerment of indigenous peoples to adopt a sustainable usufruct model, towards an ethnodevelopment led by themselves, and which is in accordance with the Convention 169 of the ILO. It would be a way to reconcile the emission reduction commitments assumed by Brazil before the international community and, at the same time, respect the right to difference, constitutionally guaranteed to indigenous peoples.

We observed a great similarity between indigenous lands and conservation units for sustainable use. In both cases, eventual benefits from the provision of environmental services by traditional peoples (indigenous and non-indigenous), as well as from the implementation of REDD projects, should mandatorily revert to these populations, since the state does not demarcate indigenous lands and not even create conservation units voluntarily, but does so by constitutional determination. Thus, it is not possible to reward the state for complying with constitutional norms, and giving effect to the fundamental right to an ecologically balanced environment. Such rewards could also undermine the principle of equitable access to

natural resources, enabling the state to provide a kind of illicit enrichment by replacing or excluding the real beneficiaries of the environmental services' provisions.

Thus, it is up to traditional peoples to implement voluntary actions that are more restrictive and beneficial to the environment (provision of environmental services) in addition to what the law itself determines by defining legal reserve areas, permanent preservation areas, management plans and plans of environmental and territorial administration. Such possibilities do not require additional regulation to the existing legal framework previously analyzed. We conclude that the sustainable livelihoods practiced by the indigenous people and other traditional communities in their territories would serve as a provision of environmental services and, consequently, as a form of partial rescue of the effectiveness of the Amazonas law, many years after its edition.

REFERENCES

AMAZONAS. Governo do Estado. *O Amazonas*: dados. Available at: <http://www.amazonas.am.gov.br/o-amazonas/dados/>. Access on: Oct. 5, 2019.

AMAZONAS (Estado). *Lei n. 3.135, de 5 de junho de 2007*. Institui a política estadual sobre mudanças climáticas, conservação ambiental e desenvolvimento sustentável do Amazonas, e estabelece outras providências. Available at: <http://online.sefaz.am.gov.br/silt/Normas/Legisla%E7%E3o%20Estadual/Lei%20Estadual/Ano%202007/Arquivo/LE%203135%2007.htm>. Access on: Oct 4, 2019.

AMAZONAS (Estado). *Lei n. 4.266 de 01 de dezembro de 2015*. Institui a Política do Estado do Amazonas de Serviços Ambientais e o Sistema de Gestão dos Serviços Ambientais, cria o Fundo Estadual de Mudanças Climáticas, Conservação Ambiental e Serviços Ambientais, altera as Leis Estaduais n. 3.135/2007 e 3.184/2007, e dá outras providências. Available at: http://online.sefaz.am.gov.br/silt/Normas/Legisla%E7%E3o%20Estadual/Lei%20Estadual/Ano%202015/Arquivo/LE%204.266_15.htm. Access on: Oct 4, 2019.

AMAZONAS (Estado). *Lei n. 3.184, de 13 de novembro de 2007*. Altera, na forma que especifica, a Lei n. 3.135, de 05 de junho de 2007, e dá outras providências. Available at: <http://online.sefaz.am.gov.br/silt/Normas/>

Legisla%20Estadual/Lei%20Estadual/Ano%202007/Arquivo/LE%203184%2007.htm. Access on: Oct 4, 2019.

BECKER, B. K. Ciência, tecnologia e inovação: condição do desenvolvimento sustentável da Amazônia. *Parcerias Estratégicas*, Brasília, DF, v. 15, n. 31, p. 15-33, jul./dez. 2010. Available at: http://www1.cgee.org.br/hotsites/cd_berthabecker/pdf/2010-4cncti.pdf. Access on: Mar 17, 2017.

BENJAMIN, A. H. V. Uma primeira leitura da nova Lei do Sistema Nacional de Unidades de Conservação. *Revista da Associação Paulista do Ministério Público*, São Paulo, ano 4, n. 34, ago./set., 2000. Available at: http://bdjur.stj.jus.br/jspui/bitstream/2011/27906/Regime_Brasileiro_Unidades.doc.pdf. Access on: Mar 23, 2017.

BEZERRA, J. A Amazônia na Rio + 20: as discussões sobre florestas na esfera internacional e o seu papel na Rio + 20. *Cad. EBAPE.BR*, Rio de Janeiro, v. 10, n. 3, p. 533-545, set. 2012. Available at: <http://www.scielo.br/pdf/cebape/v10n3/05.pdf>. Access on: Mar 26, 2020.

BRASIL. *Lei n. 9.985, de 18 de julho de 2000*. Regulamenta o art. 225, § 1º, incisos I, II, III e VII da Constituição Federal, institui o Sistema Nacional de Unidades de Conservação da Natureza e dá outras providências. Available at: http://www.planalto.gov.br/ccivil_03/LEIS/L9985.htm. Access on: Oct 5, 2019.

BRASIL. *Lei n. 12.187, de 29 de dezembro de 2009*. Institui a Política Nacional sobre Mudança do Clima – PNMC e dá outras providências. Available at: http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2009/lei/12187.htm. Access on: Oct 5, 2019.

BRASIL. *Lei n. 12.651, de 25 de maio de 2012a*. Dispõe sobre a proteção da vegetação nativa; altera as Leis n.s 6.938, de 31 de agosto de 1981, 9.393, de 19 de dezembro de 1996, e 11.428, de 22 de dezembro de 2006; revoga as Leis n.s 4.771, de 15 de setembro de 1965, e 7.754, de 14 de abril de 1989, e a Medida Provisória n. 2.166-67, de 24 de agosto de 2001; e dá outras providências. Available at: http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12651.htm. Access on: Oct 5, 2019.

BRASIL. *Decreto n. 7.747 de 5 de junho de 2012b*. Institui a Política Nacional de Gestão Territorial e Ambiental de Terras Indígenas – PNGATI, e dá outras providências. Available at: http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/decreto/d7747.htm. Access on: Oct 07, 2019.

BRASIL. Ministério das Relações Exteriores. *Organização do Tratado de Cooperação Amazônica (OTCA)*, 2017. Available at: <http://www.itamaraty.gov.br/pt-BR/politica-externa/integracao-regional/691-organizacao-do-tratado-de-cooperacao-amazonica-otca>. Access on: Apr. 6, 2017.

CAMARGO, T. R. L. *Tutela jurídica dos sistemas de compensação de serviços ambientais*. Manaus: UFAM, 2015.

DIEGUES, A. C. *Biodiversidade e comunidades tradicionais no Brasil*. São Paulo: NUPAUB/USP, PROBIO/MMA, CNPq, 1999.

DOURADO, M. F. et al. A gestão ambiental e territorial de terras indígenas: uma questão climática. *Brasíliana – Journal for Brazilian Studies*, London, v. 5. n. 1, p. 230-253, 2016.

FEARNSIDE, P. M. A água de São Paulo e a floresta amazônica. *Ciência Hoje*, Rio de Janeiro, v. 34, n. 203, p. 63-65, 2004.

GREENPEACE BRASIL. *Governador do AM enfraquece gestão de UC's do estado*, 2015. Available at: <http://www.greenpeace.org/brasil/pt/Noticias/Governador-do-AM-enfraquece-gestao-de-UCs-do-estado/>. Access on: Mar 23, 2017.

IBGE – INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. *Censo Demográfico de 2010*. Available at: <http://www.ibge.gov.br/home/estatistica/populacao/censo2010/default.shtm>. Access on: Mar 10, 2017.

OLIVEIRA, R. S.; TSAMAREN, L. M. S. Projeto Jacitara: uma iniciativa comunitária de valorização cultural. In: SILVEIRA, E. D.; CAMARGO; S. A. F. *Socioambientalismo de fronteiras: sobre uma Amazônia Múltipla*. Curitiba: Juruá, 2017. p. 91-110.

ROESSING NETO, E. *Análise da relação entre a Lei n. 3135/2007 do Estado do Amazonas e o Direito Internacional à luz da doutrina antiformalista francesa*. Florianópolis: UFSC, 2009.

SANTILLI, M. Terras indígenas e crise climática. In: VALLE, R. S. T. *Desmatamento evitado (REDD) e povos indígenas: experiências, desafios e oportunidades no contexto amazônico*. Brasília/São Paulo: Instituto Socioambiental e Forest Trends, 2010. p. 9-20.

SANTOS, F. P. Gestão de UCs no Amazonas: avanços e desafios para a conservação ambiental. *Revista Geonorte*, Manaus, v. 8, n. 1, p. 102-124, 2013.

SERRAO, E. A. O. et al. Evaluation the drought 2005 and 2010 in Amazon: analysis the Solimões Basin. *Revista Geográfica Acadêmica*, Boa Vista, v. 9, n. 2, p. 5-16, 2015.

SOARES, T. J.; HIGUCHI, N. A convenção do clima e a legislação brasileira pertinente, com ênfase para a legislação ambiental no Amazonas. *Acta Amazonica*, Petrópolis, v. 36, n. 4, p. 573-580, 2006.

VIANA, V. M. Bolsa Floresta: um instrumento inovador para a promoção da saúde em comunidades tradicionais na Amazônia. *Estudos Avançados*, São Paulo, v. 22, n. 64, p. 143-153, 2008.

Article received on: 08/26/2019.

Article approved on: 03/04/2020.

How to mention this article (ABNT):

CAMARGO, S. A. F.; GOMIDE, P. H.; CAMARGO, T. R. L. Climate Change and Projects of Environmental Services in Indigenous Lands of State of Amazonas. *Veredas do Direito*, Belo Horizonte, v. 17, n. 37, p. 309-330, jan.-abr. 2020. Available at: <http://www.domhelder.edu.br/revista/index.php/veredas/article/view/1503>. Access on: Month day, year.