RECIMA21 - REVISTA CIENTÍFICA MULTIDISCIPLINAR
ISSN 2675-6218

ENVIRONMENTAL CRIMES IN THE BRAZILIAN NATIVE CHARCOAL PRODUCTION CHAIN

CRIMES AMBIENTAIS NA CADEIA PRODUTIVA DO CARVÃO VEGETAL NATIVO BRASILEIRO

DELITOS MEDIOAMBIENTALES EN LA CADENA BRASILEÑA DE PRODUCCIÓN DE CARBÓN VEGETAL DE LOS BOSQUES AUTÓCTONOS

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e535036
https://doi.org/10.47820/recima21.v5i3.5036

RECEIVED: 02/03/2024 APPROVED: 03/03/2024 PUBLISHED: 03/18/2024

ABSTRACT
The charcoal production chain in Brazil over the last century has always been linked to labour analogous to slavery. After actions by the Ministry of Labour and Employment, this crime has diminished, but it is still part of a system of illegalities that range from land grabbing to the waste of raw materials, the approval of fraudulent forest management projects, to poor supervision and a high level of corruption on the part of environmental management institutions. The charcoal makers as the weakest actors in the production chain and without proper protection from the state, since their profession is not even recognized and they wear PPE that makes it difficult to carry out their work, continue to produce native charcoal independently as a means of survival. This work is part of the doctoral thesis defended by the author at the Open University (UAb), Lisbon, on 19/01/2022 and sought, by searching of semi-structured interviews with 23 charcoal burners (their names have been omitted), to understand a little more about how they are involved in the illegal exploitation of Brazilian forests, in the Amazon, in the Cerrado and Pantanal.

KEYWORDS: Charcoal. Labour analogous to slavery. Land grabbing.

RESUMO
A cadeia produtiva do carvão vegetal no Brasil, no século passado, sempre esteve ligada ao trabalho análogo à escravidão. Após ações do Ministério do Trabalho e Emprego, tal crime arrefeceu, mas continua parte de um sistema de ilegalidades que vão desde a grilagem de terras, ao desperdício de matéria-prima, passando pela aprovação de projetos de manejo florestal fraudados, até a fiscalização deficiente e o alto nível de corrupção nos órgãos gestores ambientais. Os carvoeiros, como atores mais fracos da cadeia produtiva e sem a proteção devida do Estado, sequer têm a profissão reconhecida ou usam EPI, o que dificulta a realização do trabalho, continuando a produzir carvão vegetal nativo de forma autônoma, como meio de sobrevivência. Este trabalho é parte da tese de doutorado defendida pelo autor na Universidade Aberta (UAb) de Lisboa, em 19/01/2022, e buscou, por meio da realização de um inquérito de entrevistas semiestruturadas com 23 carvoeiros (cujos nomes foram omitidos), entender um pouco mais como estes estão inseridos na exploração ilegal das florestas brasileiras, na Amazônia, no Cerrado e no Pantanal.

PALAVRAS-CHAVE: Carvão vegetal. Trabalho análogo à escravidão. Grilagem.

RESUMEN
La cadena de producción de carbón vegetal en Brasil durante el último siglo siempre ha estado vinculada a una mano de obra análoga a la esclavitud. Tras las acciones del Ministerio de Trabajo y Empleo, este delito se ha reducido, pero sigue formando parte de un sistema de ilegalidad que van desde el acaparamiento de tierras, el desperdicio de materias primas, la aprobación de proyectos fraudulentos de gestión forestal, hasta la escasa supervisión y un alto nivel de corrupción en los órganos de gestión ambiental. La falta de transparencia de estos organismos facilita el fraude e impide la concienciación de la población. Los carboneros, como actores más débiles de la cadena productiva y sin la debida protección del Estado, ya que su profesión ni siquiera está reconocida y usan equipo de protección individual que dificultan el desempeño de su trabajo, siguen produciendo

[1] Polícia Federal.

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ISSN 2675-6218

carbón nativo de forma independiente como medio de supervivencia. Este trabajo forma parte de la tesis doctoral defendida por el autor en la Universidad Abierta (UAb) de Lisboa, el 19/01/2022, y buscó, mediante entrevistas semiestructuradas con 23 carboneros (se han omitido sus nombres), entender un poco más cómo están involucrados en la explotación ilegal de los bosques brasileños en la Amazonia, Cerrado y Pantanal.

PALABRAS CLAVE: Carbón vegetal. Trabajo análogo a la esclavitud. Acaparamiento de tierras.

INTRODUCTION

Brazil has adopted a predatory model of forest exploitation, and the native charcoal production chain is part of this, since it uses forest residues produced in the deforestation of the Amazon, Cerrado and Pantanal. The environmental damage caused to these biomes is immeasurable, given the lack of knowledge about biodiversity and the country's native forest potential. Reforestation is seen as one of the medium-term solutions.

Until the 1970s, reforestation in Brazil and around the world had only been carried out with fast-growing species, leading to great concern about the supply of tropical timber, which is generally slow-growing, making it necessary to reforest with tropical hardwoods[18].

In the Amazon, from 1988 onwards, the establishment of pig iron producers that use iron ore and charcoal to produce pig iron. In the Carajás region, an area with a large amount of iron ore deposits, led to an increase in environmental problems in the states of Pará and Maranhão, where runs Carajás railway. The cycle of destruction of native vegetation that occurred in the Cerrado for the production of charcoal has been repeated in this region[13].

At the time, 458,000 hectares of eucalyptus in the municipality of Ribas do Rio Pardo, in Mato Grosso do Sul, and cheap labour were attractive to the pig iron producers[19]. The charcoal burners approve of planting eucalyptus in deforested areas because they see their source of income continuing[1]. Eucalyptus, a fast-growing species, has dominated reforestation plantations in the country and in a way has helped to protect the Cerrado biome (Savannah) from the pig iron producers' hunger for charcoal.

Ribas do Rio Pardo, which concentrated the largest number of charcoal plants, was the target of news reports and scandals in the 1990s, with international repercussions, due to accusations of slave and child labour in the charcoal plants. Following these accusations, measures were taken by the competent bodies and working and housing conditions were improved, as well as a ban on child labour and compulsory school attendance for children[19].

In 2001, Brazil produced 45.3 per cent of its charcoal from native forests[15]. Charcoal consumption in the pig iron sector reached 4.25 million tonnes in 2021, and the cultivated tree sector accounts for 94% of charcoal production[14], of which 360,000 tonnes are produced from forest residues that comes directly from deforestation (most of which is illegal) and residues generated by the timber industry.

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The reality of native charcoal production is usually unknown to its consumers. Charcoal is associated with the destruction of ecosystems and the exploitation of workers, but this activity generates income and is always associated with other activities among small rural producers. The clandestine nature of this production leads to a lack of technical assistance, unhealthy conditions, low self-esteem and fear of inspection bodies[4].

Pereira; Júnior[19] states that self-employed workers in charcoal plants who produce native charcoal have no chance of entering market sectors that are full of technological innovations and demand qualifications. These workers have a low level of education and are not aware of their full rights.

The lack of official and consistent data on the production of native charcoal is related to the fact that most charcoal burners carry out the activity in an unregulated manner[4]. The charcoal plants are itinerant, due to the need to be located close to the raw material (wood native to the Cerrado, Pantanal and Amazon biomes). These factors, coupled with the lack of control and assistance from government bodies, in the labour, social and environmental aspects, make charcoal burners easy targets for control and exploitation by the pig iron producers[19].

Brazilian forests of all biomes are gradually being destroyed. Schmitt[21] states that clear-cutting or selective logging, when carried out without authorization, contaminates the entire production chain for timber, charcoal and other forest products.

In the Amazon, charcoal is produced from logging residues, while in other biomes it is the direct result of extracted firewood. This destruction is endorsed by the State Environmental Agencies (OEMAs), which are responsible for approving fraudulent logging projects that contaminate the charcoal and timber production chains and prevent reputable companies from being able to survive in an environment where free market laws and competition rules are not respected.

Thus, based on this chaotic situation with no prospect of improvement, the aim of this study was to understand the native charcoal production chain, its players, identify the shortcomings of control mechanisms, the weaknesses of forest management, inspection and control systems, and the criminal investigation process, using semi-structured interviews with 23 charcoal burners from different regions of the country.

The aim was also to shed light on the crimes practiced along this production chain, in order to propose a reformulation of environmental policies, the criminal investigation process and the environmental management bodies responsible for inspection and control, so as to put an end to the irregularities that have been practiced for decades.

OBJECT

The subject is the native charcoal production chain, which serves the pig iron producers. The background is the weaknesses of the OEMAs' forest management and the crimes that exist throughout the production process. Native charcoal and wood, as forestry by-products, are part of a framework of environmental crimes that produce immeasurable damage to the environment, which is

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still not well understood by the population and has no short-term solutions from environmental managers.

METHODOLOGY

A two-stage qualitative methodology was used, the first analyzing documents and the second producing semi-structured interviews. We analyzed forest exploitation processes approved by the environmental management bodies of Amazonas, Mato Grosso, Maranhão and Roraima. These processes are rich in fraudulent land documents, fictitious environmental inspections, fraud in the electronic system for controlling forestry credits, both the DOF System (SISDOF) and the Forest Products Trading and Transport System (SISFLORA), as well as gross legal flaws.

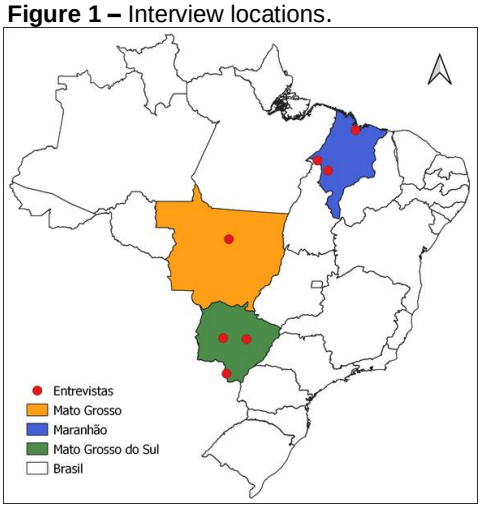
Following a qualitative methodology, an exploratory study was also carried out by conducting semi-structured interviews with the charcoal burners in order to gain a deeper understanding of the contexts in which the charcoal burners' lives take place, about which the knowledge produced is still very limited.

To ensure the anonymity of the interviewees, their names are fictitious. The qualitative data resulting from the semi-structured interviews with the charcoal burners was processed using Maxqda software, which is used in qualitative research to analyze unstructured data. Contents Analysis was used to analyze the information collected, revealing its manifest and latent content.

Sample Construction

By means of convenience sampling, followed by a "snowballing" procedure whenever possible (from the first interviewee to the others). We sampled 23 charcoal burners from the states of Mato Grosso, Mato Grosso do Sul and Maranhão, who work solely in the production of native charcoal, of whom 4 are illiterate and only 1 has completed high school (Figure 1). Qualitative analyses were generated in relation to the charcoal burners community, who are actors within the framework of Brazilian deforestation.

Figure 1 – Interview locations.



Source: prepared by the author.

Documentary Analysis

In addition to the forestry processes approved by the OEMAs, documents obtained from open sources on official web database were used, as well as information from closed databases that is not subject to confidentiality. These sources were obtained from the following sites:

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a. https://www.car.gov.br/publico/imoveis/index
b. https://sigef.incra.gov.br/consultar/parcelas/
c. https://sncr.serpro.gov.br/sncr-web/consultaPublica.jsf?windowId=308
d. http://acervofundiario.incra.gov.br/acervo/acv.php
e. https://servicos.ibama.gov.br/ctf/modulos/dof/consulta_dof.php
f. https://sso-int.ibama.gov.br/sso-interno/login?service=https://sinaflor-int.ibama.gov.br/sinaflor-int/j_spring_cas_security_check
g. https://www.inteligeo.ditec.pf.gov.br/portal/
h. https://monitoramento.semas.pa.gov.br/sisflora2/sisflora.app/publico/#/gfConsultar
i. http://dadosabertos.ibama.gov.br/dataset?q=sinaflor
j. https://monitoramento.semas.pa.gov.br/sisflora2/sisflora.app/#/home
k. http://www.funai.gov.br/index.php/shape
l. http://geocatalogo.mma.gov.br/
m. http://www.sema.mt.gov.br/siteantigo/portalsisflora/
n. http://monitoramento.sema.mt.gov.br/simlam/

DISCUSSION

Importance of Biomass

Charcoal is obtained from the carbonisation of wood biomass. Toneto Júnior *et al*.[24] state that biomass and hydroelectric power are very important in the country's energy matrix and can be used to significantly reduce the current level of emissions at a relatively low cost. This opportunity presented to Brazil is unique among emitting countries and the country would be less affected in a context of transition to a low-carbon economy.

The biomass production chain presents a high demand for human resources. From a social perspective, it has enormous capacity for generating direct and indirect employment, although most of the jobs are unskilled and low-paying. Planted forests contribute to energy generation with firewood and charcoal, preventing deforestation of natural reserves; however, they offer a medium to long-term return on investment[8]. Reforestation with exotic species poses a risk to the ecosystems that encompass the Cerrado, Amazon, and Pantanal biomes.

About 58% of Brazil's greenhouse gas emissions are related to deforestation and changes in land use. Although Brazil is considered a country with vast potential for technological development in biofuels and alternative energy sources, patent data still do not reveal even a minority presence in this technological race[24]. However, an economic and ecological zoning is necessary to determine deforested areas where the planting of exotic species will not pose a risk to biodiversity.

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Deforestation and environmental risks

Actions or omissions that influence the environment are not confined to the territory of the country where they occur. Citizens of all nations should take environmental protection as something they have in common and, therefore, should be recognized as a topic that unites everyone[11].

Deforestation is the major challenge of the Amazon Rainforest. The Amazon Biome has an extension of 4.2 million km² only within Brazilian territory, which is equivalent to 45 times the size of mainland Portugal[6].

Extractivism is seen as one of the solutions for the salvation of the Amazon, but it is only viable while the market is small. When the market begins to grow, farmers are forced to engage in plantations, which leads to the collapse of this activity. This has occurred with almost 3,000 plants cultivated worldwide. Many extractive products have already been or are being domesticated, such as the cacao tree, rubber tree, cupuaçu tree, and guarana tree[12]. Charcoal can be produced from tree prunings in cities and from the material resulting from pasture cleaning, eliminating the need for deforestation.

Deforestation is inherently destructive, but in Amazonian deforestation, it is unacceptable to cut down all trees so that only the wood from valuable species is commercialized, as occurred, for example, in Apuí, Amazonas, on 08/06/2018 (Figure 2). Deforestation, in this case, aims at land grabbing and the establishment of low-productivity cattle ranching, in order to legitimize the illegal occupation of the area.

Figure 2 – Clear-cutting of all trees despite only valuable species being commercialized.

Source: prepared by the author.

The Brazilian government could allocate publicly unallocated areas for the creation of new protected areas and for social purposes. However, when it privatizes these areas in a non-transparent manner, it encourages illegal occupation of new areas, which amplifies deforestation. The new land policy repeats an old pattern of appropriation of public land, rewarding illegal occupants through the sale of land below market prices, which in turn stimulates new occupations of public lands and land conflicts[3].

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In the Amazon, protected areas are deliberately deforested to force a reduction in their size. This is happening in the Jamanxim National Forest (Jamanxim FLONA) in Pará, where both the forest and the conservation unit are being cleared. Land grabbers, loggers, and deforestation always go hand in hand. Most of the large-scale deforestation is carried out by "outsiders," "influential individuals," and "powerful figures"; the majority are from Mato Grosso, São Paulo, and the southern regions of the country. Currently, in the region of Novo Progresso, Pará, land grabbing is driving deforestation. The main deforesters do not raise cattle. They clear the forest and sow pasture to sell the land. "Whoever deforests will be the owner," said one of the defendants in Operation Castanheira, launched in 2014 by the Federal Police[26]. Current legislation encourages such behavior, as it ends up protecting land grabbers and large business owners.

Law nº 13465/2017 expanded amnesty for land grabbers, shifting the temporal cutoff from 2004 to 2008, increasing the possibility of legalizing usurped public lands from a maximum limit of 1,500 hectares to 2,500 hectares, and established negligible prices for titling medium and large properties, with payments ranging from 10% to 50% of the floor price in the table set by the National Institute for Colonization and Agrarian Reform (INCRA). Following the enactment of this law, it is estimated that approximately 60 million hectares are subject to legalization[26]. This vast amount of forest with enormous potential for exploitation poses a global environmental risk of natural resource depletion.

The illegal logging in the Amazon has been predominantly carried out by criminal organizations rather than isolated individuals as many imagine. The Brazilian government must ensure that future generations have access to the same natural resources that exist today or as close to it as possible[16].

Knowledge systems should enable the identification and characterization of potential or actual global environmental risks and seek new pathways to reverse unsustainable trends and find ways to slow down the ongoing destructive activities that lead to depletion of natural resources resulting from economic and social activities[11].

The charcoal makers

Depending on the role the charcoal maker performs within the charcoal-making activity, monthly income can range from one to three minimum wages. It is observed that the average income of charcoal makers is higher than that found in other activities, which is one of the major attractions for these workers. To supplement their income, these workers engage in secondary activities or consider them as their sole source of income, but they return to charcoal making as soon as possible.

The legislation requires charcoal makers to use Personal Protective Equipment (PPE), but the vast majority do not use the equipment specified for each activity. The resistance to use is due to the discomfort associated with wearing them during the activity[1].

The interviewed charcoal makers were self-employed, and none of them reported using PPE properly. They claimed that the existing PPE hinders their work and creates even more adverse

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conditions for the workers, either due to lack of adaptation to their use, lack of awareness of their utility, or the low quality of existing PPE. Charcoal makers Wanderlei and Antony have different perceptions regarding potential risks due to their personal experiences with charcoal making.

> *Look, man! It's relative because, let me tell you! I think about charcoal-making the same way I think about smoking! Some people smoke for 50 years and have nothing wrong! Some smoke for 10 years, get cancer, and a bunch of stuff! Charcoal-making is the same way! 90% of the people I know have nothing wrong!*
> *(Wanderlei, 35 years old)*

> *I have a problem now, actually, because I'm taking medicine for... for my lungs, right! I got an x-ray of my lungs because I worked a lot with the first furnace, you know! And then that furnace smoke did harm to me!* (Antony, 59 years old)

Among charcoal makers, there are cases of pneumoconiosis, which result in health damages and affect the workers' quality of life. Through monitoring and prevention control, it is possible to reduce the risks. It is important for the employer to take responsibility for providing PPE and to conduct training and awareness campaigns for the proper use of these equipment[2]. The charcoal makers justify the use of native plant material by the charcoal kilns, claiming that they utilize the waste from deforestation and are not directly responsible for it[1].

> The charcoal kiln is not to blame! Firstly, the charcoal kiln doesn't work with wood from the forest, let's say, right! If you set up a charcoal kiln in the middle of the forest, then start cutting and burning, of course, there would be a problem... of course, then there would be an issue, right! It would be damaging a virgin forest, but since it works only with residue … (Bráulio, 59 years old)

In addition to the low utilization of residues from sawmills, a high degree of waste was also observed from these industries. Due to the use of outdated equipment and machinery pieces with minor defects from centuries-old trees are either burned or turned into charcoal (Figure 3).

Figure 3 – Wood pieces with minor defects are transformed into charcoal.

Source: prepared by the author.

Charcoal makers also claim that the population and the media discriminate against charcoal production, associating it with slave-like labor and deforestation due to lack of knowledge about this activity. One limitation encountered when interviewing charcoal makers was collecting data at the

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charcoal kilns because even though they are licensed activities, there is fear and distrust due to the activity being frowned upon by the population[1]. Due to the findings of slave-like labor reminiscent of the past century until 2008, there has been a negative impact on charcoal production, as even today in licensed charcoal kilns, there is still prejudice from the population.

The workers who subjected themselves to slave-like labor in the past and those who do so today are individuals living in poverty, chronically lacking basic means of subsistence, and with scarce prospects of obtaining them[17].

Environmental crimes in the production of native charcoal

It is impossible to address native charcoal without studying the context of the native forests that supply the wood (firewood) for its production. The presence of steel mills in the Amazon region or the Pantanal means that the raw material for charcoal production is the native forest itself.

Da Silva e Congilio[6] It was observed that in the municipality of Goianésia do Pará, starting from 2011, the reduced amount of forest residues from sawmills produced in the region forced charcoal suppliers to steel mills to resort to the native forest itself. The loss of native vegetation and its biodiversity was accompanied by the introduction of slave-like labor.

Slave-like labor is associated with maintaining human beings without access to clean water, providing them with poor-quality food, not paying them wages, forcing them to sleep outdoors, and denying them rights and freedom of movement[10], Just as in the case observed in the Santo Antônio do Matupi District, Manicoré municipality, in Amazonas, on 11/08/2018, with wood extractors (chainsaw operators), which is quite common, especially in the northern region of the country (Figure 4).

Figura 4 – Flagrant of conditions analogous to slavery.

Source: prepared by the author.

Similarly, the presence of steel mills in the state of Maranhão has led to increased forest exploitation in protected areas such as the Gurupi Biological Reserve (Gurupi REBIO). Celentano *et al*.[5] reported that Maranhão is the largest producer of charcoal among the Amazonian states, and this

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region has been marked in recent years by forest fires of criminal origin in areas of degraded forests, where wood has been extracted for sawmills and charcoal production.

The main modus operandi of the criminals is the cutting of trees in conservation units, the falsification of forest guides, and the insertion of false data into control systems. Workers are recruited to carry out the forest extraction and accept it because it may be their only means of livelihood[16].

Criminal organizations in the timber industry involve high-ranking public officials, political campaign financing, failures in control systems, and fraud in environmental permits, composing a complex criminal hierarchy. The actions of environmental management agencies (OEMAs) are limited to suppressing the simplest level of this hierarchy; one that, if dismantled, would not even scratch the operationality of the criminal scheme. It is unavoidable to note the involvement of logging companies in electoral campaigns. When the State omits itself, it does so to favor interests with which it has formed alliances[26].

Those who transport, trade, acquire, or store such forest products and by-products are subject to punishment. Enforcement of illegal transportation of charcoal or wood alone contributes little to deterring illegal exploitation, due to the large amount of cargo transported daily both by road and waterway networks[22].

In the forest control systems of the Environmental Secretariats of Mato Grosso and Pará (SEMA/MT and SEMAS/PA), called SISFLORA, there are inconsistencies that demonstrate the lack of centralization of information regarding forest exploitation, which hinders oversight by society and weakens monitoring by the managing authority itself. The failures and lack of convergence between the control systems of the EMAs allow for the generation of fictitious forest credits[23].

Forest credit transactions occur through computerized systems. If an area is embargoed due to illegal deforestation, those who trade or transport cattle or agricultural products produced there will be fined and have their products confiscated. Confiscation has an immediate deterrent effect due to the generated decapitalization. There is intense trade in forest credits, which are illegally generated through fraud occurring in earlier stages of the production chain. These forest credits legalize illegally produced charcoal and sawn timber[22].

Environmental degradation carried out by illegal logging can never be considered insignificant, given the potential harm of the conduct, the significant results, and the continued offending behavior of the perpetrators[16].

This type of fraud is not only detected through cargo inspection. Fraud in the origin of forest credits for charcoal or sawn timber occurs when the OEMA approves fictitious credits either in exploited or non-exploited areas, credits in public areas or areas of suspicious land tenure. Surplus credits are used to exploit unauthorized areas such as conservation units, indigenous lands, and public lands[22].

With the entry of native wood logs into the sawmills' yards, there is a need to justify in the control system (SISDOF), at which point they input false data, relying on suppliers capable of

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providing the necessary forest credits. It is worth noting that they occasionally enlist the participation of corrupt inspection agents[16].

There is a scenario of inefficiency in environmental enforcement, which may compromise the deterrent effect aimed at by coercive logic. It's about improving the performance of public administration to extract the best results from environmental management instruments. There are weaknesses in the exercise of coercive power by the Brazilian Institute of Environment (IBAMA), a federal agency considered a reference in combating deforestation; regarding the Environmental Management Agencies (OEMAs), the weaknesses are even greater. Considering the structuring of these OEMAs that comprise the Amazon region, it is questionable to aim for deforestation reduction[22].

In 1989, IBAMA was created and prevented the decentralization of environmental management actions in Brazil, but on December 8, 2011, Complementary Law nº 140/2011 was enacted. According to this legal provision, most deforestation in the Amazon became the responsibility of the Environmental Management Agencies (OEMAs), while a small portion, belonging to federal conservation units, indigenous lands, and settlements of INCRA, remains under the competence of IBAMA.

Politically, it may not be in the interest of local dominant groups to punish those who secure their votes for public office, but there may be an interest in monitoring and punishing an offender belonging to an opposing political group, using the structures of the OEMAs. Thus, if there is no supplementary environmental enforcement by the federal government, negative consequences for the protection of the Amazon forest may occur[21].

The SEMAS of Pará, a state that consistently leads deforestation rates in Brazil, held a selection process in 2021 for hiring Environmental Management Technicians, with salaries of EUR 440. The contracts of the employees lasted only one year, with the possibility of extension, to work as inspectors of projects and environmental activities in the Amazon region. Only in January 2024 did a new selection process for permanent positions as Environmental Management Technicians begin, with salaries of EUR 580.

The low salaries do not attract the most qualified professionals, and the previously annual contracts, without a structured career, prevented the employee from serving the public structure, but rather whoever is in power. This fact indicates that the lack of structure in the OEMAs is intentional, aiming to hinder enforcement, create difficulties, and make the staff as maneuverable as possible.

Schmitt; Scardua[22] demonstrated that the loss of institutional credibility can motivate the offender to take the risk of committing the offense, given the small possibility of having to bear the sanctions (imprisonment, fine, confiscation, embargo). The certainty of the absence of punishment is related to the inefficiency of public administration in identifying violations and applying sanctions to those responsible.

Deterrence has a preventive nature, causing new illegal behaviors not to occur due to fear of punishment. The deterrent effect is greater the more capable we are of identifying environmental

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infractions and penalizing them. Deterrence is the main indicator of the result of environmental enforcement activity[21].

The severity of the penalty concerns the extent of punishments, assuming that the longer or stricter they are, the more they tend to deter the offense. Environmental enforcement is an activity of environmental administrative police power, which seeks to induce behavior change through coercion, in order to prevent further environmental damage from occurring[22].

Environmental licensing cannot be a mechanism used to legalize illegal activities. The charcoal burner Alípio sums up the sentiment among charcoal makers that it's enough to pay for charcoal (or any other forest product or by-product) to be legalized.

> *Having money and paying the fees, we can do whatever we want... you go knock down that tree over there, without a permit, boy, you're already facing a criminal case! But if you went there, paid to knock it down, then you can knock it down, you can set it on fire, whatever you want... it's just that the government wants money* (Alípio, 40 years old)

Environmental licensing is an administrative procedure in which the environmental agency evaluates in advance projects and activities with effective or potential capacity for environmental degradation. It is the duty of the public authorities to safeguard environmental assets constitutionally. Administrative management of the environment should be based on complex and preventive planning, in order to minimize future risks to the fauna, flora, and biodiversity. Environmental public policies should entail planning and organization of sustainable practices[9].

The initial work of the technical staff of the OEMAs upon receiving the request process for forest exploitation should be to observe the land reality of each rural area proposing timber extraction. The majority of lands exploited in the Amazon are products of land grabbing, and the OEMAs sanction such irregularities by producing forest credits that allow the regularization of forest products and by-products from lands that belong to Brazilian Society.

For land grabbing to succeed, it is necessary to divide the large improper appropriation into several smaller lots (currently, the legislation allows up to a maximum of 2,500 hectares). For each of these lots, an independent process is opened in the federal land agency (INCRA), with different "frontmen" as applicants, so there are several "frontmen" for a single land grabber. The protocols of the processes at INCRA are then traded as if they were land titles, given the certainty that the lands will be legalized in the future[26].

Meanwhile, the charcoal burner Jônatas lives on the outskirts of Rice Road, in the camp known as Eldorado, in the District of Petrolina, municipality of Imperatriz, in Maranhão, where he hopes to be settled one day. To survive, he produces charcoal from the nuts of the Babaçu palm tree (*Attalea speciosa*), abundant in the region.

> *Because we have nothing to do, we can't work. If we go there, we're invading those lands* (Jônatas, 64 years old)

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The regularization of large estates in the country puts a huge amount of land on the market, diverges from the constitutional criteria of social function, and indicates a weakening of agrarian reform policies in the country, undermining the creation of settlement projects and regularization of possessions of traditional communities. Land policies should not be geared towards the market, as it is not capable of solving Brazil's agrarian problems. There is a slow pace and low effectiveness of development actions in already established settlement projects[20]. As a result, we have the regularization of a large amount of land in the name of land grabbers, the absence of a serious agrarian reform policy, and the destruction of the Amazon rainforest.

CONSIDERATIONS

In a brief summary, native charcoal in Brazil, as well as other forest products and by-products, are produced amidst a series of irregularities and environmental crimes ranging from land grabbing (especially in the Amazon) to deficient environmental enforcement, riddled with corruption, protection of large landowners, control of EMAs by political groups, and complete lack of concern for recurring environmental damages and the sustainability of the Amazon, Cerrado, and Pantanal biomes.

In the search for wood and firewood for charcoal production, in Maranhão, due to the conversion of Cerrado areas into pastures, pressure has increased on areas of the Amazon biome, such as the Gurupi Biological Reserve and Indigenous Lands. In addition, in this state, there are serious issues with agrarian reform, which forces many charcoal burners to survive by producing charcoal from Babassu palm nuts (*Attalea speciosa*).

In Sinop, Mato Grosso, the interviewed charcoal burners survive by producing charcoal from the use of residues from timber industries, which, as in the entire Amazon region, benefit from wood sourced from logging projects with environmental licenses filled with fraud, functioning as a veritable forest credit industry that is used for the exploitation of protected areas such as Indigenous Lands and Conservation Units.

In Mato Grosso do Sul, the establishment of steel mills in the Pantanal region compromises the existence of this biome, as cattle ranchers clear areas with savanna vegetation in order to expand exotic pastures (*Brachiaria spp*.); the resulting wood is used to produce charcoal that supplies the pig iron steel mills. The specific legislation recently approved for the Pantanal allows for the maximum exploitation of this biome, without protecting it, practically decreeing its end in the near future.

In all regions, charcoal burners unanimously agreed on the use of Personal Protective Equipment (PPE); most products available in the market are incompatible with the temperatures and other adverse conditions faced by charcoal burners, and they only use them in the presence of labor inspectors. In addition to charcoal burners, wood and firewood extractors also suffer from situations akin to slavery. In this regard, since 1995, the Special Mobile Inspection Group, under the Labor Inspection Secretariat (SIT) of the Ministry of Labor and Employment (MTE), as well as the creation of the "dirty list" of employers, have drastically reduced the cases of these human rights violations.

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The pig iron steel mills are the main users of native charcoal, but they outsource production, which effectively exempts them from labor rights and direct involvement with present environmental crimes, as well as reducing the price paid for the product (because it is outsourced and illegal). At the other end is the charcoal burner, whose profession is not even recognized.

The sustainable management plans that should allow for the longevity of forests are riddled with fraud and serve only to formalize the documentation of illegally produced wood and charcoal. The crimes committed along the wood and charcoal production chain are conducted by national and even transnational groups (in the case of wood), and involve public officials, forestry engineers, politicians, land grabbers, and loggers.

The ongoing operations of IBAMA and the Federal Police operations, such as Jurupari, Pharisaios, Salmo 96:12, Hymenaea, Canafístula, Arquimedes, Akuanduba, and Handroanthus, are part of a body of attempts to contain organized crime plaguing the forests, which so far have managed to slow down the pace of destruction of Brazilian forests, but without successfully protecting them.

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