TRANSMUTED EXPLORATION IN EFFECTIVE DEVELOPMENT FOR THE AMAZON

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Abstract

The present article presents historical information about the periods of exploitation, transmuted in the figure of a fallacious development, which in the last 300 years, has not brought effective gains to the population residing in the Amazon. The criticism is based on the historiography of events that took place since Portuguese explorations with sertão drugs in the 17th and 18th centuries; going through the economic cycle of rubber and mining of minerals; the exploitation of wood from the migratory flow encouraged by the military governments; reaching the present day with the production of agricultural

commodities and hydroelectric enterprises. The false developmentalist conceptions make use of the extent to which the Amazon was exploited in the name of false development, said by those who exploit it in the name of progress and not as the effective and sustainable development of those who reside in the Amazon. All of this has resulted in gains for the few, resulting in the social, economic and environmental imbalance of many.

Keywords: development, Amazon, exploitation, Developmental policies.

Introduction

What to expect in terms of development for the Amazon in the next 30 years? We started the article with this simple question, but at the same time, it becomes so complex, especially when we think in terms of present and future, that is, what is being done today so that we have a promising future for the north of the country? The proposal of this article, based on the main question, is intended to make us reflect on the importance that the Brazilian Amazon has for its residents and for the rest of the residents in the country, whether from an environmental, social or economic perspective.

Rhetorically, a response like the one we initially questioned becomes evident if we consider the immense myopia of Brazilian governments in the last 60 years, when implementing development policies for the Amazon. The world, for some time now, knows its importance, but historically, through the events that will be reported in this article, it is clear that in the last 300 years it has not yet discovered that the main Amazon is settled the country's wealth, its biodiversity.

Developmental policies implemented to develop the region failed one after the other, were real hoaxes, which lured the accounts of big capital more than resulted in improvements for the region, and further impoverished the large mass of people living in the urban and rural areas of the cities. from the Amazon.

In the Amazon, temporary, ephemeral policies have been developed, resulting in more social ills than permanent benefits. In the long run, the demands of the most vulnerable in society for better schools, hospitals and infrastructure in cities and rural areas have not been harvested and are not being reaped.

The Amazon, historically, is considered a peripheral region, in a peripheral country, when analyzed in the broad geopolitical and economic space of the country (Gonçalves, 2019).

The regional development of cities and rural locations in the Amazon originated from developmental outbreaks, promoted by the opportunism of capitalism. So it was with the backwoods drug cycle, the rubber cycle, mining and, more recently, the construction cycle of large hydroelectric works. Historically, it is an economy based on looting, which has always occurred through expropriation in "[...] extractive activities of primary products, with very low added value, destined for commercialization and industrialization in more developed centers, without retention surplus to the local economy " (Mello, 2015, p. 93).

The very truth of all this, as Nobre and Nobre (2018) would say, is that the effective development policies for the Amazon, idealized by the military governments and which were still perpetuated soon after the process of redemocratization by many democratic governments, was always for geopolitical reasons never escaped from economies other than the production of commodities: spices, rubber, livestock, soybeans, corn, mineral exploration, hydroelectric energy, among others.

In this article, we will present the historical process of exploration and regional development, created for the Amazon, and with that, show the insignificant result generated by deceptive and apparent developmental practices for the region.

We will not attribute the historical phases of the sertão drugs, the rubber cycle and the artisanal mining cycle as development policies, but we will use them as an exploratory practice for those who came here and did not leave positive legacies for the people living in the Amazon.

The article is organized into six topics, all of which emphasize periods, cycles and or passages that effectively marked the economy in the Amazon. The first topic deals with drugs in the sertão, the first economic cycle recognized by national history. Then, we approached the rubber economy, which we understand to have been a national dream in the Amazon rainforest that in a meteoric way did not materialize in effective development. The third topic, we deal with mining and mining, a second unfulfilled dream of a development so expected for the Amazon, this topic was divided into two subtopics, the first deals with the Carajás project and the false hope of social development for the State from Pará and in the second subtopic we present the artisanal mining of Serra Pelada in Pará and that of the Madeira River in Rondônia. The fourth topic, we deal with the continuous and intermittent exploratory cycle of the extraction of noble wood from the Amazon, motivated by the migratory process encouraged by the military governments in the 1970s and 1980s. Finally, we present the effective development as an analysis of the phases and or periods discussed in this article.

1. Economic Period of Drugs in the Hinterland: First Conception of Economic Exploration of the Amazon

In the middle of the 16th century, while the northeast of the country was already being explored by the Portuguese, Dutch, French and others, teeming with the sugar economy, at the expense of hearts in the minds of African slaves; in the north of the country, between the seventeenth and eighteenth centuries the exploitation of drugs in the hinterland in the region of lower Madeira and tributaries of the Amazon River began, it was “[...] when the Portuguese, from Recife and Salvador, they moved to the region in order to keep out English, Dutch and French competitors who took over the hinterland's drugs ”(Cardoso; Muller, 1977, p. 21).

As it is still an inhospitable place, as the Brazilian region was, to a large extent, without the minimum condition to settle there, there were not, according to Prado Jr. (2011, p. 223) enough people to make the exploitation of the discovered spices in the Amazon. In his words: "The few whites, the relative multitude of indigenous people who were not efficient for the service that was required of them, could not handle the task". However, the existing labor force at the site, the indigenous, which, unlike other operating practices, was well suited to the activities required by the explorers (Prado Jr., 2008), after all, a large part of what they did in return, for the indigenous people it was very common, “[...] penetrate the forest or the rivers to harvest the products or capture the fish [...] Harvesting, hunting, fishing, are already their resources in the state of nature [...] ”(Prado Jr., 2011, p. 224). Thus, the indigenous people lived and thus exchanged their services with the so-called futile knick-knacks that the explorers handed them over. Another important group of people who contributed cooperating with the process of extracting drugs from the hinterland, were

the descendants of the Mamelukes, who came from Pernambuco and Maranhão and also by the few mestizos found in the Amazon region (Teixeira, 1999).

The exploitation of drugs in the hinterland, did not become evident as a form of regional development in the conceptual molds of the term, not least because, the explorer's own thought was not to settle, or take root in the region. In the Amazon, the process of economic exploitation was difficult, especially when considering the distances for the disposal of products, which today does not differ much from that time.

Many natural products were found in the Brazilian Amazon, which could be used as spices and other culinary and healing purposes. Cloves (Syzygium aromaticum), vanilla (Vanilla planifolia), cinnamon (Cinnamomum verum), indigo (Indigofera suffruticosa) sarsaparilla (Smilax rough), cocoa (Theobroma cacao), in addition to: chestnuts (almonds), aromatic roots, oilseeds, woods, and other native products. (Cardoso; Muller, 1977; Prado Jr., 2011).

It is in the process of extracting drugs from the backland that the Amazon region will find its first economic base (Prado Jr., 2008). Of course, it cannot be considered that backcountry drugs were a circular economy, based on the standard economic concept. What is concluded from this is that those few explorers who remained were those who founded the first urban societies in the region, however, over time, and with the conditions of the place, were the first to seek other economic sources, still based on the exploratory paradigm and accumulation of wealth.

The process of expropriation of wealth that did not stay and did not translate into effective development, which were materialized in the figure of the products that were extracted from the land, were through a rudimentary process, a primitive form, different from the current way, occurred in the current times, in which the Amazon biome is destroyed to make pasture for cattle and the extensive cleaning of huge strips of land for planting grains (soybean and corn).

Because it did not leave positive legacies in the case of civilizing development in the areas explored, it cannot be said that during this period there was a depletion of drugs from the backcountry, or from other sources such as wood (Prado Jr., 2008). The explorations, although marked in the history of the country as the first economic cycle of the Amazon, were unsystematic, not had a negative environmental impact in that period, but an economic impact for the population that lived here.

2. Rubber Economic Period: The Chimera of a Development in the Amazon Rainforest

Another important moment of this economy of saquepation was the economic cycle of rubber that "[...] it is born and develops with the objective of cheapening, through the imposition of colonial prices to rubber [...]" (Cardoso; Muller, 1977, p. 24). The raw material of latex was in great demand due to the first Industrial Revolution, which needed more than ever destand insum for the production of tyres, pulleys and other goods derived from the sap of the rubber tree (*Hevea brasiliensis*) (Marta, 2018).

For most historians and researchers who have studied the economic cycles of rubber there is unanimity when it comes to periods of rise and decline. For this large majority, the first economic moment of the Amazon occurs between the years 1870 and 1920. In this period, known as *the Belle Époque,* the phase of rubber expansion lived its main moment, which was marked by the construction of buildings similar to

the large urban centers of Europe (Oliveira; Trinity; Machado, 2012). All the richness of the period is due to the fact that the Amazon is practically the only place in the world with rubber production.

Amazon rubber was the fastest demand raw material for the expansion of the world market (Furtado, 2007). "In 1878, one hundred percent of the world's production of the product was Brazilian" (Cardoso; Muller, 1977, p. 28). "As global demand for the product was constantly increasing [...]" (Oliveira; Trinity; Machado, 2012, p. 11),thanks to industrial expansion in England, the Amazon had what the first Industrial Revolution wanted to project itself to the rest of the world industrially. However, it was not so easy, because the automotive industry aimed to produce cars scalarly, but the progressive reduction of fixed costs, but it was faced with low latex production capacity and also the difficulty of logistics, which was due to latex extraction inside the forest, storage and mainly transport to latex processing centers in Europe.

The country was not prepared to take advantage of this opportunity and transform it into effective development, nor create barriers to incoming competitors, which soon after in the declining phase, resulted in the production of rubber by Malaysia, with higher productivity and costs much more attractive to the demanding market.

As there was not yet an urban nucleus and population contingent in the entreposted cities (Manaus and Belém), capable of catalyzing the rubber collection and transport process, it was necessary for the country to encourage the migratory flow of northeasterners to the Amazon. According to Cim (2003, p. 3) it is estimated that "[...] around 1872 to 1900, about 150 to 300,000 northeastern migrants entered the Amazon, much of this migratory flow was motivated by the historic drought that occurred in the years 1877 to 1879, and even before that, by the "[...] crisis caused in the cotton hinterlands of the Northeast by the resumption of the American position in the international cotton market, after the end of the Civil War in which that country was involved" (Gonçalves, 2019, p. 36).

Cim (2003),also comments, that with the arrival of northeasterners to work in latex extraction, the first international conflict between Brazil and Bolivia occurred, which was motivated by the invasion of Bolivian territory to collect the syringe by Brazilians in lands where the State of Acre is currently located. From this, the agreement known as the Treaty of *Petrópolis* results, in which Brazil committed itself to build a railway from the city of *Guajará-Mirim* to *Porto Velho* (Leal, 2018). This railroad aimed at transporting rubber, Brazilian and Bolivian. The fundamental strategy was that *Porto Velho would* be a rubber warehouse in Europe by the Madeira *River* (Marta, 2018). The agreement provided for the construction of the railway, a payment in two installments of £1 million. The first sight and the second with ninety days (Cim, 2003).

In 1912 the *Madeira Mamoré Railway* (EFMM) was inaugurated, which was soon not sustained by the malaysian rubber competition itself.

It was very common for migrants to think about leaving their homelands with the intention of enriching and returning. Those northeasterners beset by drought and lack of choice of jobs, intended the return to the hinterland, so as most of those who came here, since the times of the drugs of the hinterland, came here to work, raise money and thus resume their lives in lands in which they will be born (Gonçalves, 2019).

The flow of international capital to the Amazon occurred in order to capitalize greater and better results with rubber, was all destined to enable the production and scalar transport of latex.

In 1912, at the time of the inauguration of the EFMM, the country exports 42,000 tons of rubber to Europe. This moment was odd for the country's export history, because 81% of them were precisely, 41% related to coffee and 40% of rubber (Oliveira; Trindade; Machado, 2012).

Sumptuous buildings such as the stheaters: Amazonas in Manaus, the Peace in Belém are built by anew elite of rubber, inspired by the European bourgeoisie that had provided electricity, telephone, and access to classical music and arts (Oliveira; Trinity; Machado, 2012). Ports are built in Belém and Amazonas; among other resulting infra structural investments originating from the rubber cycle.

The entire flow of resources to finance Brazilian rubber resulted in effective development and or economic sustainability for the population living in the affected cities. With the economic decline of rubber, after the second cycle, the population that had migrated from the northeast of the country began to swell the urban centers of the cities of Manaus and Belém, resulting in many social problems (Becker, 2015).

3. Economic Period - Mining and Mining: The Second Chimera of a Development in the Amazon

3.1 Carajás the False Hope of Development for the State of Pará

Unlike rubber, mining (legal and illegal mining) was a little more lucky if we analyze the enterprises in the state of Pará and consider the temporality that involves the economic process of mining versus *the* extraction of rubber. The first case, still persists today, while the second cycle, had its collapse in the face of the decrease and cessation of international demand.

The current legal mining in the state of Pará *promoted by Cia. Vale do Rio Doce* (CVDR) does not differ much from previous enterprises in the Amazon, when compared in terms of what leave local societies legacy for economic development. A good example of this is what occurs in the region of *Carajás.* An area rich in iron ore, where the average *per capita income* is the highest in the state of Pará, is also above the national average, close to R$ 50,000.00 (Nobre; Noble, 2018). However, social indicators such as health and education services are quite different from those in other parts of Pará, and well below the national average. This means that, in practice, the wealth generated in the effectively rich place as the *Carajás* region does not translate into quality of life or basic services to citizens.

For Benatti (1997, p. 11),the projects implemented in the region of the great *Carajás* "[...] it has been shown to be highly income concentrators and generators of few jobs [...]" this is because a large part of the people who reside and work directly and indirectly to meet cvrd's demands, are from outsourced jobs, or autonomous service providers, who in the vast majority do not have employment ties. Only 25% of the workforce operating in *Carajás,* in the iron ore complex, are fixed workers, approximately 1,700 people. The other, are hired from outsourced companies (Benatti, 1997).

At the time when the *Carajás* mineral reserve was discovered in 1967, during the period of the Brazilian dictatorial governments, the mineral potential found was: iron, copper, gold, kaolin and bauxite. Financed by external investments, the research was carried out by government agencies, the DNPM (National Department of Mineral Production) created in 1934 in the government of Getúlio Vargas and cprm (Mineral Resources Research Company) which was created in 1969.

The *Carajás Mineral Reserve* has indicated that it has a resounding capacity to exploit iron ore. *Carajás* has the capacity to be exploited for at least 500 year (Benatti, 1997; Gonçalves, 2019).

Ten years after the discovery of the *Carajás* mineral reserve, the federal government publishes Decree-Law No. 1813 of November 24, 1980, which establishes *the Grande Carajás* Program (PGC), its objective was to promote regional development and improve the quality of life of the populations that encompassed the project region.

The PGC was organized to be a:

[...] integrated planning of natural wealth, the manufacture of a wide range of products from raw material to final product, and intensive use of local insum, dilution of massive investments in infrastructure, maintenance of the ecological balance of the region and the social well-being of populations (Benatti, 1997, p. 2).

In fact, an innovative proposal for the time, but, nothing that has been materialized the way it was planned.

3.2 Artisanal Mining in Pará and Rondônia: Mining that has no Development

Motivated by the need to pay foreign debt and also with the intention of expanding national monetary reserves, which were practically consumed by the increase in the price of oil (Veiga; Silva; Hinton, 2002) on the international market, in the face of the OPEC crisis in the early 1970s, the military government encouraged the practice of mining in areas that had exploitative potentials.

The intention of the military government was to populate some more areas still poorly inhabited, such as the Federal Territories of Rondônia-RO, and Roraima-RR. To this do, he decided to create the Mining Reserves in the Amazon.

Seven mining areas were created through an ordinance of the Ministry of Mines and Energy, two in Rondônia, with a total size of 455.77 km²; one in Roraima 120 Km²; three in Pará with 29,697 km²; and one in Mato Grosso 1,210 Km². The areas totaled 31,483 km², representing 13.3% of the Amazon mining area (Veiga; Silva; Hinton, 2002).

A remarkable moment of this period, was what occurred in the early 1980s, exploded the mining of *Serra Pelada* in Pará. About 100,000 brazilian men from various parts of the world (Veiga; Silva; Hinton, 2002) were concentrated in the region in search of making riches with their own hands. Like an anthill, the men descended into a huge hole (pit), dug from both removing land with pickaxes and shovels, they gathered that land in bags and climbed on makeshift stairs ravine above. Serra Pelada, in 1983, produced about 14 tons of gold, until the 1990s production reached 90 tons (Veiga; Silva; Hinton, 2002) extracted from the world's most famous mining, which inspired several films of national and international production.

Veiga; Silva and Hinton (2002, p. 270), comment that "[...] mining represents an activity absolutely consistent with the lack of rural development planning in most developing countries", which certainly reinforces the entire period in which the Amazon has passed and passes, with the lack of an effective economic development. "The mining of Serra Pelada, housing at its peak more than 80,000 workers, was the best expression of this image of wealth-misery that this development model engendered in the Amazon" (Porto Gonçalves, 2019, p. 107).

In Rondônia the mining of the Madeira River (alluvial) in the 1980s was also no different from the *Serra Pelada mining* in Pará. Pre-snare between the late 1970s and mid-1990s a large influx of migrant adventurers from various parts of the country, with the promise of quick and easy enrichment(Marta, 2018).

The beginning of mining in Rondônia occurred in the late 1950s with the exploration of cassiterite "[...] prospectors discovered large deposits of cassiterite in the region, this news soon spread throughout the area and the major centers of the country, its repercussion was immediate, attracting huge contingent of migrants to the region" (CIM, 2003, P. 7).

The gold found in the Madeira River, and cassiterite in the 1980s according to Cim (2003) were the two main economic products of the then Federal Territory of Rondônia.[1] Cim (2003), comments that in 1987, mining on the Madeira River produced a lot of individual wealth and also a lot of social and environmental problems, contributing to the increase in violence, consumption of "[...] drugs, prostitution, diseases, gambling, alcohol abuse and degradation of moral principles are frequent consequences of the chaotic occupation of prospectors [...]"(Veiga; Silva; Hinton, 2002, p. 247).

The economic benefits obtained by the prospectors did not compensate for the deplorable socioeconomic conditions left in the communities formed by the mining (Veiga; Silva; Hinton, 2002).

Cim (2003, p. 8), within the same measure contributes by also mentioning that:

> [...] benefits were almost nil. It was a predatory extraction and high environmental impact [...]. The exploitation of gold left as a legacy: environmental pollution, contamination of the water table, in fish, huge erosões of the bed and river banks, environmental destruction, fuel oil pollution, tailings thrown into the waters, abandoned equipment and sedimentation of the navigable channel, violence in its broadest sense, in addition to many destroyed families, all added to many social problems, now existing, fruit of greed, easy profit and "social status"".

The truth that is known about mining, whether in *Serra Pelada or* even in the Madeira *River*, is that they proved that there was no materialization of an effective development, on the contrary, leaves many social ills as pointed out by previous researchers.

The history of artisanal mining shows us that it has always been so, and it always leaves more burden than bonus to local society.

4. Continuous and Intermittent Period of Wood Exploration, *Soybean* and Livestock Commodities.

4.1 Migratory Flow and its Consequences for The Exploitation and Commercialization of Madeira in Rondônia

The migratory flow occurred in Pará and especially in Rondônia occurred due to the openings and paving of the highways: BR-153 (Belém-Brasília), BR-163 (Cuiabá-Santarém) and BR-364 (Cuiabá-Porto Velho), the latter being the main promoter of migration from the south, south and southeast of the country; and the incentives to donation lands in the federal territory of Rondônia (TFR).

This intensive migration occurred from 1970, through two major programs. The first included five projects and had as main umbrella the Integrated Colonization Projects (PIC) and the second had two other projects, which were based on the Directed Settlement Projects (PAD), these programs distributed lots of 100 ha, on

[1]Rondônia was elevated to the state category in December 1981 and its installation in January 1982.

the br-364 axis, all facilitated migration (Aubertin; Becker, Becker, Swain; Ferreira et al., 1988), for the new Brazilian eldorado.

According to Aubertin; Becker, Becker, Swain; Ferreira *et al.* (1988) migrants came from various parts of the country, but those who populated Rondônia the most between 1979 and 1984 were those who came from: Paraná with 30% of migrants, Mato Grosso with 16%, São Paulo with 9%, Mato Grosso do Sul with 8%, Espírito Santo 7% and Minas Gerais 7%. Rondônia in 1950, had approximately 36,935 inhabitants, thirty-five years later this number increased almost 600%, the most significant decade of this increase was 1980, which had 342% population growth(Aubertin; Becker; Swain; Ferreira et al., 1988).

The vast majority of these migrants, when they were not settled in the plots given by the state, stayed in the cities with the intention of working in the trade or even to undertake some kind of business in the cities along the BR-364 that were in the process of urban training. Other groups, were the prospectors who came in large quantity and here were staying. All migrants who received lots from the state began to intensify deforestation for timber marketing and for agriculture and livestock.

The arrival of migrants motivated the extensive illegal exploitation of timber in the region, where deforestation along the BR-364 and some roads near the highway predominated. The timber companies settle in the "[...] attempt to work with precious woods for export (mainly mahogany and imburana). In this way, we find nothing less than, in the brand new *city of Rolim de Moura,* more than 100 sawmills in activity" (Aubertin; Becker; Swain; Ferreira *et al.*, 1988, p. 177).

The new economy of the new State of Rondônia is formed from deforestation for agriculture and livestock, financed in part by the felling and marketing of noble timber and in others, by the state's tax incentive programs, which effectively was an important driver of deforestation in the 1970s to 1980s, largely these incentives were credits with interest well below those practiced by the financial market.

4.2 Soybeans and Livestock: Continuous and Intermittent Deforestation to Serve Agribusiness

The State of Rondônia, as well as the other regions of the Amazon, were in the 1960s places of difficult access to land, nothing from there came out, nor, nothing arrived there. With the opening of the BR-364 and its seam, it was facilitated the flow of both illegally exploited timber, as well as the arrival of more migrants who came with the intention of making fortunes in the new Brazilian eldorado. A large part of the migrants who arrived here contributed to boost the growth of the state, and obtain wealth from the land.

To transport some of the *main commodities* and have a significant reduction in cost, it was necessary to create a multimodal transport route, partly occurring by BR-364, and the other part by the Madeira *Waterway*. Therefore, Rondônia, its capital, is considered an important region for the transport warehouse between other *commodity-producing states in the* central region of the country and some Andean countries. To reinforce that. Aubertin; Becker, Becker, Swain; Ferreira *et al.* (1988, p. 178),commit that basically, every border city has as its function "[...] be a place of exchange between the rural world, which provides the products of the pioneer front, and the industrial centers of the country, interested in these products [...] The city acts as a mediator between "center" and "periphery"." The proof of this is that most of the cities of the Amazon, especially those of Rondônia are places of passage of grains, meat and other *agricultural commodities* to countries such as: China, and some countries of Europe.

The monoculture of soybean more recently, has been one of the products, which in a legal way, has been leaving many environmental problems to society and almost nothing of materialized wealth in effective development. The grain economy that was once concentrated in the southern center of the country is beginning to expand to the northern region. Rondônia has been expanding the areas of soybean cultivation year after year and once again, enriching few landowners with the invasion of indigenous lands and reserves destined for environmental preservation.

Costa Silva (2014) exposes that soybeans in Rondônia began in 1997 in the southern region of the state. In that year, 636 ha were used to produce 1,260 ton, in 1998 this number jumps to 7,892 ha, producing 15,790 ton., and in 2010, 110,723 ha, resulted in 385,388 ton.

More recent data indicate that there was not proportionally a productivity gain in soybean production. Comparing the extreme periods in the historical series in table 01, 2015/2016 with 2019/2020 there was an increase of approximately 38% of the planted area for a productivity Kg/ha of 8%, when production increased by 49%.

Table 01 – Evolution of Soybean Production in Rondônia 2015 to 2020

Period	Planted Area (thousand ha)	Production (thousand ton.)	Productivity (Kg/ha)
2015/2016	252,6	765	3.028
2016/2017	296	930,3	3.142
2017/2018	333,6	1.095	3.282
2018/2019	333,7	1.109	3.324
2019/2020	348,4	1.138	3.268

Source: Embrapa (2020)

Livestock farming, resulting from the felling of wood and burning is another period that enriches few to the detriment of many. Cattle raising alone accounts for 80% of all deforested areas in the Legal Amazon (Nobre; Noble, 2018). It is quite true that, the tax incentives for the sector have decreased greatly, but, technological improvements and management of geological conditions in areas such as the east of the Amazon have made room for increased productivity and a significant reduction in costs(Vieira; Toledo; Silva; Higuchi, 2008).

For each hectare used by livestock there are on average an occupation 1.35 head of cattle (Nobre, 2019 (a)). Only for the economy of livestock, soybeans and other economies considered unsustainable has already deforested 1,000 square kilometers of the Amazon rainforest (Nobre; Sampaio; Borma; Castilla-Rubio et al., 2016),and of this total, 170,000 square kilometers are abandoned by livestock and agriculture (Nobre, 2019 (a)). This shows that there is idle capacity in the deforested areas for grazing, and that there is a great inefficiency in livestock considering that these 17% of idle capacity could have been avoided as an area deforested for pasture use, because certainly, there are studies that show that it is not necessary to expand the pasture areas more to obtain more productivity.

A study conducted in 2018 by the Institute of Conservation and Sustainable Development of the Amazon (IDESAM) shows that more productivity can be achieved by the adoption of good practices with recovery

and management, performing a division of pasture into pickets, including forage plants and tree species in the pasture system, with this, the IDESAM report indicates that the amount of animal per hectare can be increased by up to four and a half times, from 0.75/ha to approximately 3.5/ha (Silva; Carrero, 2018).

Nobre (2019 (b) exposes another data on the amount of cattle capacity per hectare. According to him the national average is between 1.3 and 1.4 head of cattle per hectare.

Regardless, the productivity numbers per hectare are low, only with pasture management can one reach an average of around 3 to 3.5 heads per hectare.

It is necessary to think of livestock as an economy of sustainable intensification, to use what is already destined for it, without the need to increase the amount of pasture to the detriment of a false illusion of increased productivity.

5. Economic Period of hydroelectric power plants in the Amazon

The history of dam construction in the Amazon dates back to military governments with the completion of two hydroelectric dams in the late 1970s and three others in the 1980s. The first hydroelectric plant in the Amazon was built *in the Federal Territory of Amapá* in 1975, certainly motivated by the exploration of manganese from the Serra do Navio deposit. The *Coaracy Nunes dam* on the *Araguari* River, had an installed capacity of 68MW, and its reservoir occupied an area of 23 km². The second dam was in 1977, *the Curuá-Uma,* in the river of the same name, its electricity generation capacity was 40MW, and had 78 km² of occupied area for its reservoir.

The 1980s were one of the most differentiated and striking in terms of energy projects in the Amazon. It was during this period, where the resources of the Amazon were most explored in an unplanned way, and where the need to undertake a developmental discourse for the Amazon in the name of the great capital, encouraged by the military governments of the time, was more vociferous. A big lie, which has not developed in any way the region, on the contrary, left and has been leaving a trail of huge environmental problems in the name of the poliactive interests.

The *Tucuruí hydroelectric*plant in Pará is agood example of this, built on the *Tocantins River,*was inaugurated in 1984, its installed capacity is 3,960MW, formed a reservoir of 2,430 km², the energy generated in Tucuruí was destined to meet the demands of Albrás-Alunorte for aluminum production and Alumar that benefited bauxite(Fearnside, 2015b; Marques; Souza; Alves, 2019).

Another example was the event in the *Amazon* with the construction of the *Balbina hydroelectric*plant, inaugurated in 1987. Built on the *Uatumã River,*it started to generate 250MW, flooding 2,360 km² (Fearnside, 2015b) a larger areas of hydroelectric reservoir that effectively did not translate into potential energy generated. The construction of *Balbina,*as well as all hydroelectric plants built in the 1980s, resulted in more burden than bonuses. *Balbina* flooded part of the *Waimiri-Atroari indigenous* reserve; caused fish deaths with a lack of wateroxygenation extending 145km downstream of the river; resulted in loss of vegetation along the road connecting the dam to the BR-174 highway, among other socioeconomic and environmental problems(Manaus-Boa Vista). (Fearnside, 2015b)

The Samuel hydroelectric *plant located* in the municipality *of Candeias do Jamari-RO* was the last of the dams built in the 1980s in the Amazon. Like its predecessors, it did not result in energy efficiency compared

to the already known burden stemming from its constructions. *Samuel*, on *the Jamari* River, started to generate 216MW of installed capacity, occupied an area of the reservoir of 540 Km². Initially budgeted at US$ 835.97 million, its costs in the end reached much higher figures, Fearnside (2015a, p. 18) comments that "No information has ever been released specifying the final cost of the dam and its transmission lines", but author, makes a comparison with: Balbina, *Tucuruí* and Itaipu *in terms* of *kilowatt* installed. While the first plant compared it to *Samuel*, the second went on to have$675/kilowatt and the third $1,206/kilowatt, *while Samuel has* logged $3,870/kilowatt. *Samuel*, it was a poorly planned hydroelectric plant, the site where it was built was flat, which required the construction "[...] 57 km of dikes to limit the lateral expansion of the reservoir and thus increase the elevation uneven that could be created without flooding an even larger area." (Fearnside, 2015b, p. 19). A cost far above the power generation capacity.

The environmental damage with *samuel's construction is many*, *approximately* 420 km² of forest was lost; there was a significant increase in wood exploration, given the migratory process itself; many significant losses of the ichthyofauna of the region, given the very conversion of the current water system to the lentic of still water; elevation of the water table in cities close to the dam; among other social effects and related to human health.

The biggest problems of the plants built in the Amazon in the 1980s, due to the lack of planning, this all caused many future problems, which today society pays for the increase in the generation of gases effect studies; the impacts on human health with the increase in the number of cases of[2]malaria resulting from the increase of mosquitoes in the areas of the reservoirs; with the identification of the high concentration of mercury (Hg) in fish in the region and in people living in riverside localities, among other social diseases resulting from hydroelectric plants built in the Amazon.

As hidrelétricas de *Belo Monte* (PA), *Santo Antônio* e *Jirau* (RO) foram outros empreendimentos que vieram e deixaram muitos rastros nocivos na Amazônia, dentre eles o aumento desenfreado populacional sem as mínimas infraestruturas de saúde, transporte e segurança, comportáveis para suprir o grande volume de pessoas que migraram para trabalhar nas frentes de trabalho das cidades desses empreendimentos, que ao cessarem deixam mais ônus do que bônus a sociedade local.

Not unlike hydroelectric projects of the 1980s, the plants of the years 2000/2020 also had their social, economic and environmental burdens, with some technological differentials in the production of electricity. *Santo Antônio* is generating 3,568MW, occupying a reservoir area of 350 Km²; Jirau *Plant*,3,750MW, occupies 361.6Km² of reservoir; *Belo Monte* has an installed capacity of approximately 11,233MW and its reservoir is at 516Km²(Fearnside, 2015b).

Although the size of the reservoirs of the hydroelectric dams mentioned above are much smaller than that of hydroelectric plants built in the 1980s, there are still many harmful impacts on society, which are not the same as those already widely reported, but new problems harmful to health to the environment and to traditional peoples living in the affected localities. It is known that many were the learnings with the *disastrous ventures of Balbina and Samuel*, but there are still impacts resulting from the constructions of Santo *Antônio, Jirau and Belo Monte* that are too expensive when compared to the benefits that such enterprises result in Amazonian society.

[2]Carbon dioxide (CO_2); Nitrous oxide (N_2O); Methane ($C H_4$)

6. Effective Development

By reflecting analogously on Arrighi's theory (1998) it is understood that the development previously conceived, planned and or emerging for the Amazon was an illusion. This is the Brazilian periphery trying to transform itself into a semiperiphery through an equipurpose of pseudoprogress without an effective development. One cannot conceive of a development model for the Amazon, paraphrasing Keynes, that in the long run we will all be dead. That is, we will deforest and burn to raise cattle, we will make forest turn beautiful fields of soybeans, corn and other grains, we will savanna the Amazon because it is independent of what is done, we will all be dead in the long run, after all, it is better that few get along in the present, because the future to God belongs, and if God and Darwin want, the most adapted will be alive somewhere still preserved. There is no way to think of a predictable type of development like this, even if it can be a collective benefit, which in this case is not.

A Amazônia precisa de um tipo de desenvolvimento que preconize a inclusão do pleno exercício dos direitos civis, políticos e cívicos; precisa de desenvolvimento pautado em sustentabilidade, pois é necessário que as políticas para o desenvolvimento sejam concebidas em longo prazo, passíveis de continuidade, sem que possam exaurir em partes ou na totalidade o bioma que a sustenta; que seja um desenvolvimento sustentado porque economicamente é importante que esse desenvolvimento se auto sustente (Sachs, 2008) e gere resultados equilibrados a sociedade do norte do país.

Verdadeiramente não dá pra se pensar em uma teoria desenvolvimentista que enxerga apenas oportunidades de negócios ao grande capital, como o caso de Rondônia enquanto entreposto e fluxo de produtos commoditizados, Pará, que tem no minério de ferro seu principal produto, o qual todo o entorno dos empreendimentos são destinados a viabilidade desse produto. É preciso, pensar uma teoria de desenvolvimento para Amazônia que preveja uma abordagem em que as regiões possam enfatizar a inovação e o uso de tecnologias como forma mais adaptável ao seu desenvolvimento, possibilitando o enraizamento permanente das atividades econômicas locais (Fochezatto, 2010).

Conclusion

Tod the periods treated in this article are not inclusive, and do not sustain themselves in the long term economically, leave many negative impacts on society and the local economy. Porto Gonçalves (2019, p. 14) reminds us that: "[...] the development model that was tried to be implemented was imposed on the region by people outside it [...]" and so it has been since it originates and stands by the world order, sometimes in colonialism, sometimes in imperialism (Porto Gonçalves, 2019),and now more recently by globalism when the Amazon is internationalized, sometimes in imperialism (Porto Gonçalves, 2019),and now more recently by globalism when the Amazon is internationalized.

The truth is that it is not today that a new type of development for Amazon is discussed. Anderson, Anderson, "Anderson". Alegretti; Almeida; Schwartzman *et al.* (1994, p. 14) said that it was necessary to think of the Amazon as a provider of another type of economy "[...] sustainable forest product economy; a model of use of natural resources that accelerates, diversifies and compatible economic progress with social development and the preservation of the standing forest".

It is necessary to conceive an economy that is based on biological and biomimetic assets of the biodiversity of the Amazon (Nobre, 2018(a)). According to Mittermeier; Mittermeier; Brooks, Brooks, "Brooks". Pilgrim *et al.* (2003), in the Amazon these assets revolve around 40,000 species of vascular plants and 30,000 endemic. In only one hectare of the Amazon forest one can have between 400 and 750 trees (Vieira; Toledo, Toledo, Silva; Higuchi, 2008).

In the region where there is the highest concentration of deforestation, popularly known as the deforestation arc there can be in an area of 1 km² of the forest 45,000 to 55,000 (Ter Steege; Pitman; Sabatier; Castellanos et al., 2003).

This bioeconomy is superior to the current one, because it is inclusive, is sustained and sustainable. It shows the opposite of the economy that has its bases in exploiting the finitude of natural resources, on the depletion of these, to explain their traditional economic models. A model that has already been proven by the history of development for the Amazon as a real failure, when we think of environmental, economic and social development.

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