Socio-environmental sustainability: a case study in the good future community in Barcarena in the Paraense Amazon

Sustentabilidade socioambiental: um estudo de caso na comunidade do futuro bom em Barcarena, na Amazônia Paraense

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ABSTRACT

The present article brings some critical reflections regarding the socio-spatial and environmental condition of the Comunidade of Bom Futuro, in the municipality of Barcarena, PA. These are observations made from the field work, aiming to carry out an analysis of the impacts caused in the community, having as main instrument the geographic analysis observed in the field, the empirical data of the local inhabitants and secondary data, which provide the basis for this discussion, these data will be discussed from the results obtained by the tables and graphs of the tool of analysis of the state of sustainability - MESMIS. The results show that the use of natural resources and socio-spatial and environmental changes have drastically transformed the local landscape, demonstrating that the interest of the capital invested by the company Hydro Alunorte linked to the Norwegian group Norsk Hydro aims at the unrestrained use of resources, without guaranteeing quality of life of the majority of the population. It concludes that the systematization through MESMIS reached a value considered far below the critical level of its global sustainability (Note 2.5: 10.0), which proposes immediate actions by the public power to soften the current situation in the community in question.

Keywords - Socioenvironmental Analysis; Sustainability; Comunidade Bom Futuro-Barcarena.

RESUMO

O presente artigo traz algumas reflexões críticas sobre as condições socioespaciais e ambientais da Comunidade de Bom Futuro, no município de Barcarena, PA. São observações feitas a partir do trabalho de campo, com o objetivo de realizar uma análise dos impactos...
carrados na comunidade, tendo como principal instrumento a análise geográfica observada em campo, os dados empíricos dos habitantes locais e os dados secundários, que fornecem a base Para esta discussão, esses dados serão discutidos a partir dos resultados obtidos pelas tabelas e gráficos da ferramenta de análise do estado de sustentabilidade - MESMIS. Os resultados mostram que o uso dos recursos naturais e as mudanças socioespaciais e ambientais transformaram drasticamente a paisagem local, demonstrando que o interesse do capital investido pela empresa Hydro Alunorte vinculada ao grupo norueguês Norsk Hydro visa o uso irrestrito de recursos, sem garantir a qualidade de vida da maioria da população. Conclui que a sistematização através do MESMIS atingiu um valor considerado muito abaixo do nível crítico de sua sustentabilidade global (Nota 2.5: 10.0), que propõe ações imediatas do poder público para amenizar a situação atual na comunidade em questão.

Palavras-chave: Análise Socioambiental; Sustentabilidade; Comunidade Bom Futuro-Barcarena.

1. INTRODUCTION

The present work is the result of field activity, promoted by the Specialization Course in Geography and Environment, Federal University of Pará - Campus Ananindeua. The proposal was to make an interdisciplinary approach on the subject of environment and mining activity in the community of Bom Futuro, in the municipality of Barcarena - PA. The municipality of Barcarena is located in the intermediate and immediate geographical region of Belém. The municipal seat has the following geographical coordinates: 01º 30' 24" south latitude and 48º 37' 12" longitude west of Greenwich. The municipal hydrography has as main water bodies the Marajó Bay, the Arrozal hole, Barcarena river, Itaporanga river, Moju river and Uruenga river. Much of these are of paramount importance for navigability in the region.

The city of Barcarena, which concentrates a large production of ore in the state of Pará and region, is of great interest to large companies and markets. In it is installed the company Hydro Alunorte, linked to the Norwegian group Norsk Hydro. Mining projects and mining and metallurgical activities in Barcarena cause great impacts of different natures and with different results, among them the social, economic, environmental and structuring impacts of urban areas, thus generating different economic dynamics in the same territory.

Thus, this work aims to make a brief analysis of the socio-environmental impacts caused by the mining activity in the Bom Futuro community, having as main instrument the geographic analysis observed in the field, local residents' speech and secondary data, which provide the basis for this discussion, these data will be discussed from the results obtained by the tables and graphs of the MESMIS social-environmental analysis tool. In this context, it was discussed how the uses of natural resources and socio-spatial changes transform the local landscape, showing that the interest of capital aims at the unrestrained use of resources,
without guaranteeing the quality of life of the majority of the population. Barcarena is one of the mining territories that help connect Pará on an international scale from the transformation of bauxite. This provides that this territory becomes a space of dispute and conflicts, that arise from the implantation of great projects, created without popular participation and without return of local social responsibility.

2. METHODOLOGY

2.1. AREA OF WORK

The Bom Futuro community is located in the District of Vila do Conde, City of Barcarena. This community is characterized by its proximity to its water bodies with the area of influence of the tailings basins of the company Norsk Hydro Alunorte (Map below).

![Figure 1. Map of the study area location.](image_url)

2.2. METHODOLOGICAL PROCEDURES

At first moment, it was made a discussion in the classroom, and carried out the secondary data collection, from the bibliographic survey. Theses, dissertations, books, articles, articles published on the Internet were consulted, as well as maps and documents with demographic information of the place, such as the databases of the Brazilian Institute of Geography and Statistics - IBGE and Institute of Economic, Social and Environmental
Development of Pará - IDESP, as directed by Oliveira (2000), since this exercise is necessary to discipline the look about the local reality, fine-tuning the analyzes and allowing a more critical position on the part of the researcher.

In the field, we used as an open interview tool, in which we recorded with the permission of the speaker all the conversation we had, we also used notebooks, and worksheets of the tool MESMIS - Framework for Evaluation of Natural Resource Management Systems Incorporating Sustainability Indicators based on Massera (et al., 1999) and Silva (et al., 2013) adapted to the context of the Northeast of Paraense. After applying the tool together with the family and guided tour of the property, the data were systematized and integrated, allowing a systemic analysis of the same.

3. RESULTS AND DISCUSSIONS

The mineral exploration in Brazil was initially given as a strategy as a result of the crisis of capitalism established in the 1970s by countries considered as "central nations". This strategy was achieved through the search for "central nations" by countries not yet developed with the purpose of installing their industrial plants and thus expanding their capital (GOMES et al., 2017). As a consequence of this, in relation to the Amazon Pará, the implementation of several large projects were realized as: Trombetas (1960), for the exploration of bauxite; Grande Carajás (1970), for the exploitation of iron ore and for the mine-railroad-port complex; hydroelectric plant of Tucuruí (1970); Albrás-Alunorte (1976), for the production of alumina and metallic aluminum and others (NASCIMENTO, 2009).

Mineral exploration and agriculture are considered the two basic anthropic activities for the world economy, through them, the man extracts natural resources that are used thus feed the entire economic matrix of a country. Among the two, the mineral exploration is the one that evidently causes a greater environmental impact due to impact not only the area from which the exploration is made in itself, but also neighboring areas that are used as sterile sites for tailings dumps from that activity (SILVA, 2007).

In general, the mining activity basically implies suppression of vegetation or impediment of its regeneration. In many situations, the topsoil of higher fertility is also removed, and the remaining soils are exposed to the erosive processes that can result in silting up the surrounding water bodies. The quality of river waters and reservoirs in the same basin may be adversely affected by the turbidity caused by fine suspended sediments as well as by
pollution from leachate and hauled or contained in effluent from mining areas such as oils, grease, heavy metals and can even reach groundwater (BERNARDIN et al., 2004).

All previously mentioned impacts may have damaging effects on the ecosystem balance, such as habitat reduction or destruction, scaring wildlife, death of terrestrial and aquatic fauna and flora specimens, including extinction species, disruption of flow corridors and biota movement, among others. In relation to the anthropic environment, mining can cause not only environmental discomfort but also health impacts caused by noise, air, water and soil pollution. The disfigurement of the landscape is another aspect generated by mining whose impact depends on the excavation volume and the visibility due to its location (MECHI et al., 2010).

In the specific case of what was observed and what was reported by the interlocutors of the Bom Futuro community, the anthropic activities linked mainly to the mining activity and the present dump in the community, has brought a series of impacts that reflect in the decrease of the quality of life of the dwellings. Good future has around 1000 residents, and has approximately 400 houses, the water supply is made by artesian well, however this water is not suitable for consumption, with this, the water supply (for consumption) is made by the company, but not all residents receive this water, and according to reports, there is no exact delivery schedule. According to a report of diligence carried out by the Legislative Assembly of the State of Pará (2018), since 2000, at least 22 environmental accidents were recorded in the municipality of Barcarena. What hit the Bom Futuro community directly, occurs on the weekend of February 17 and 18, 2018.

After visits on the property and application of tools such as the timeline; cross-country hikes; with the family and the application of the MESMIS tool, we can observe in Figure 02 that, in a relatively short period of time (less than five years), the family responsible for the experience of ownership has not been able to reverse an aggressive process of anthropization of the space. The result of the systematization of the MESMIS, reached a critical value of its global sustainability (Note 2.5: 10.0).

| Table 1. Results of the indicators, used in the property analysis, Bom Futuro Community, Barcarena - PA. |
|---------------------------------------------------------------|
| Dimension                  | Ideal | Bom Futuro |
|----------------------------|-------|------------|
| Environmental              | 3,3   | 0,8        |
| Social                     | 3,3   | 1,0        |
| Technical-economical       | 3,3   | 0,7        |
| General                    | 10,0  | 2,5        |

Source: Field Search. Authors, 2018.
Figure 2. Current state of ownership sustainability, Bom Futuro Community.

Source: Field Search. Authors, 2018.

Regarding the indicators, the most important are those related to productive activities, which used to be grown vegetables and vegetables, for consumption and for sale, and after the dump and leaking of the waste from the mining company, it was no longer possible to produce.

From the existing weaknesses, it is observed in the details of figure 02 that the economic dimension is the most affected, but this limitation is explained to a great extent by the imposition of the environmental conditions that the property is in and the low economic capacity of the family, using only the assistance of the Federal Government, through Bolsa Família to guarantee the family's livelihood.

The other fragilities of the property, pointed out by the MESMIS tool, are explained more by two reasons that extrapolate the familiar project, namely: a) the landscape left by the model of space exploration, mining and waste disposal (dump) and; b) due to lack of basic sanitation policies and still living with the pressure of the mining company in the region in the search for the continuous exploitation of the ore, with no return to the families that are close to the exploited areas, contributing to a reduction in the quality of life dimension.

In summary, one of the most limiting factors of property is related to the biophysical environment, that is, limited access to water resources in the property, due to the absence of permanent sources of water, since the existing well was isolated for use, including domestic. The family depends on the distribution of water made weekly by the mining company, both for consumption and for all domestic activities. From a systemic perspective (BOURGEIOIS, 1983), it can be inferred that the current project of the family is based on surviving the inclemencies, without presenting much perspective:

   Everything, I had a lot of pepper, they all died, I had a papaya foot, it died all right, and then it appeared in people like that, like an itch, right now that we
"stopped" [...] bath with this water, the people so giving water here people, we do not know until the day goes. (Literal transcript of the interview granted by a resident on July 5, 2018).

The following image shows a general graph of all the points raised in the visit of the property, from the interviews and observations:

Figure 3. Systematized points from the data provided and observer in the family property interviewed, Bom Futuro Community, Barcarena-PA.

Source: Field Search. Authors, 2018.

Grouping the critical points raised, we can cite: from the economic point of view, we can infer from the observations and interviews, which stems mainly from the conditions of the environment via a large environmental imbalance caused by the reduction of areas of natural vegetation, introduction of mining activities increased incidence of diseases, progressive reduction of natural soil fertility, lack of productive areas, employment opportunities and income, which leads to a low level of family income.

From the environmental point of view, the progressive reduction of natural resources is considered as the main limiting factor to maintain the current productive activities of the property, reduction of water resources, water quality has been affected by the mining activity, aggravated by the recent environmental disasters, and deforestation has reduced natural diversity giving visibility to a pasture presence in the landscape.

From the Social point of view, poor access to public services has caused a low quality of life for the family in the community, in line with a low level of family organization, since
they do not present a level of trust in community leaderships, little collective participation in decisions, lack of public services linked to health, and precariousness in community education services, since the college is in the center of Barcarena.

4. CONCLUSION

The human being has passed, to be considered as a result of the environment that surrounds it, and must act in the environmental defense as an imperative objective for the protection of humanity. From this perspective, the notion of socioeconomic development arises in harmony with the preservation of the environment. Sustainable development as a path only makes sense if it is directly associated with the process of building more sustainable societies and vice versa, since a sustainable society is no more than a society capable of building and rebuilding in a human and environmental development logic (natural, social, cultural, political and economic). In view of the environmental problem and the emergence of the concept of sustainable development, it is essential to incorporate sustainability as a key objective in the training of future citizens, contributing to a correct perception of the world, generating responsible attitudes and behaviors for resolution of the complex problems of contemporaneity and that can contribute to the construction of a more sustainable society.

On the other hand, to reject sustainable development as a process (even if subject to different conceptual interpretations) that can generate alternative solutions to the development model that has put us in the current crisis, obviously does not seem to be the best solution. Some authors consider that the utopia (for some) and the project (for others) of "sustainable development" have put in jeopardy not only the unlimited economic growth and predator of nature, but the very mode of production and capitalist consumption, demanding new forms of economic and social organization. Thus there is an incompatibility of principles between sustainability and capitalism, generating a basic contradiction that has been at the center of all debates. They seem to be irreconcilable in the current context of capitalist globalization.

Population growth has been accompanied by intense urbanization according to a model that mainly serves the capitalist economic interests linked to the powerful sector of extraction of natural resources in Barcarena. This policy has been responsible for an intense disturbance and reduction of sources of fresh and potable water: diversion, channeling and landfill of water courses; waterproofing of extensive soil surfaces, which has an effect on the recharge of aquifers; contamination of watercourses and groundwater, among others. In addition, a type of speculative urbanization pushes the lower-income population to the
periphery, which usually ends up occupying risky areas, often urbanized, without any planning or urban infrastructure. The intense and disorderly urbanization is thus associated with growing social exclusion, with a marked increase in the number of people who do not have access to the fundamental rights of the human being: housing, health and education.

As reported by the resident, this situation has resulted in the increase and dominance of crime, chemical dependency, promiscuity, increased diseases, child prostitution, trafficking in illicit drugs, among others. Associated with disorderly migratory flows, associated with ethnic, racial and/or religious conflicts, new and old forms of female discrimination, attacks on children's rights, marginalization of various kinds, etc., are now indicators of crisis and they are factors of enormous pressure with which the local society confront.

Finally, although older cultures and traditions have expressed concerns about the sustainability of natural resources, history shows that many societies predicted some situations and changed the course of history, but others have disappeared. It seems that in the last two centuries a scientific and technological knowledge has developed that has distinguished this society from others that disappeared in the past, does not mean, however, that we will be unharmed. It is necessary to recognize and consider other conditions, in addition to being fully aware of the impact of human actions on the environment and this is reflected in the interview of the resident of the Bom Futuro neighborhood in Barcarena.

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