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DIAGNOSIS OF MANAGEMENT OF SOLID WASTE OF THE CIVIL CONSTRUCTION: ENVIRONMENTAL APPROACH IN THE MUNICIPALITY OF ITACOATIARA- STATE OF AMAZONAS (BRAZIL)

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SUMMARY

The expansion of the construction sector in the municipality of Itacoatiara (AM) has led to a significant increase in the generation of solid waste, which is often deposited in irregular places. However, actions have been taken to reverse these environmental impacts, including the enactment of municipal laws that establish guidelines, criteria, procedures for the management of construction and demolition waste (RCD), and determine responsibilities among generators, transporters and municipal agencies. The present study aimed to estimate the generation and mapping of the main sites of irregular disposition of Itacoatiara RCDs. In order to do so, the research was carried out in two stages. First, it was visited the state and municipal public agencies and agents involved in the generation and collection of wastes in Itacoatiara, in order to estimate the generation of RCDs. Already, the mapping of the deposition sites of the RCD was done by means of photographic surveys in loco in regional poles determined by the City Hall of the city. With the research it was possible to understand the agents involved in the generation, treatment and disposal of solid waste related to civil construction in the municipality of Itacoatiara. In which irregular provisions were found at different points in the city. A fact that promotes the degradation of the different environments involved directly and indirectly to these materials; And that the implementation of waste management programs related to civil construction is the guiding factor for reducing the volume of these materials in the municipality.



KEYWORDS: Itacoatiara, Waste, Degradation, Environment and Management.

INTRODUCTION

Waste generated by the construction industry, both construction and demolition (RCD), has caused major problems in all Brazilian municipalities. The reasons are the greatness of its volume around 50% of all solid urban waste Generated; Its origin caused by the waste of the activity, depleting the natural resources, contrary to principles of sustainable development and degrading the landscape. Irregular disposal causes damage to the environment and the quality of unrecoverable lives. It causes clogging of rainwater galleries increasing the cost of urban cleaning, silting up of water resources, landfills of permanent preservation areas, suppression of vegetation cover, and proliferation of disease vectors (Schalch, 2005).

With the development of techniques and methods to make sustainability and recycling feasible, the trend would be to discourage day-to-day waste disposal at the jobsite, thus making environmental problems mitigable. Where recycling practices become one of the most effective alternatives for low environmental impact and cost reduction, with the creation of other new products of the same raw material, ensuring reuse. According to Silva (2006), almost all sectors of the construction industry generate solid waste, due to the waste materials in the buildings. For municipal public coffers this also means a great loss, since they end up having almost responsible for the removal and locomotion of these accumulated wastes (Azevedo, Kiperstoke Moraes, 2006).

In view of this context, the Amazonas Environmental Protection Institute (IPAAM), in partnership with the State Secretariat for the Environment and Sustainable Development of Amazonas (SDS) and the Amazonas Association of Municipalities (AAM), signed an agreement Interinstitutional cooperation for the development of a program to support municipalities in the preparation of their respective municipal plans for the management of solid wastes (RS), and was signed on March 17, 2011, at the Legislative Assembly of the State of Amazonas (AAM, 2011a). In this sense, the Municipality of Itacoatiara located on the left bank of the Amazon River, east of the State of Amazonas, seeks to solve the problems generated by small and large generators of construction waste. However, for this cycle to be established, it is fundamental that the Municipal Manager and constructor / generator is aware of the importance of its role in this process, making possible the adoption of a rational and creative posture that facilitates the evolution of constructive techniques and management of Human resources, thus enabling the reduction of different forms of waste and environmental impacts. In this sense, this study proposes to make a qualitative diagnosis of the current situation of construction and demolition waste (RCD) after the Construction of the River Port in the Municipality of Itacoatiara-AM, so that future actions can be taken in order to meet current standards and , As a consequence, to contribute to the preservation of the environment.

METHODOLOGY

Study area

This research was conducted in Itacoatiara municipality located in the metropolitan region of Manaus by Complementary Law No. 52 of May 30, 2007 (as amended by Law 59/2007), in the state of Amazonas , the left bank of the Amazon River on the highway AM-010-266 km, 175 km away in a straight line and 201 km via river from Manaus (Figure 1), latitude 12°44'26 " east and a longitude 60°08'45" west , with an altitude of 612 meters , And has its limits defined as follows: To the North with Silves and Itapiranga, to the South with the Municipalities of Altazes, Careiro and New Olinda of the North to the East with Boa Vista do Ramos and Uricurituba and to the West with the Capital Manaus and the municipality Rio Preto da Eva, with a land area of 10.2412 km² in its totality (IBGE, 20115). Inserted in the largest river system in the world, the Municipality of Itacoatiara is located in the Amazon Basin that has as main element of drainage the Amazon River that bathes the mentioned municipality.

The municipality has an average annual minimum temperature of 25 ° C and 34 ° C as the maximum average. In the vegetation of the municipality the Amazonian biome predominates. In 2009, the municipality had 106 health facilities. Its Human Development Index (HDI) is 0.711, and considering below the national average and compared to the HDI state that was 0,780.0 soil municipality is classified as red soil Photo / yellow, with sand on earth dystrophy -firm. In the lowland areas, the domain is alluvial soils, of the Gley type Low Damp Distrophic, presenting medium and high natural fertility (Brazilian Soil Classification System of Embrapa / SiBCS, S / D).

Itacoatiara has important civil constructions, such as the fluvial port, responsible for a large amount of

freight transport, being the second largest fluvial port in the country, as cargo arriving from cities such as Belém, Cuiabá, Santarém and Manaus arrive daily. Thus, with increased demand, the Government of Amazonas built the new fluvial port of Itacoatiara, 280 km away from the capital, completely renovated and expanded. The modern structure of the new port includes a floating main passenger terminal for loading, unloading and berthing of vessels, a guardhouse and an ice factory. In addition, this port has sheds for merchandise storage, an outpost of human trafficking prevention, tourist assistance, spaces for leisure and support of men of the Military Police and Fire Brigade, this one aims at the conservation of the environment, defense Diffuse and collective interests of society; Because of it, citizens, faced with the unsatisfactory performance of representatives of members of the Executive and Legislative Branch, may demand continuous and closer participation of the decision-making bodies on the environment. (MACHADO, 2010, p.101). However, the generation of debris in this expansion was directly proportional to the growth and economic development of the society, providing inadequate disposal of construction and demolition waste (RCD). According to Morais (2006), the inadequate disposal of construction and demolition waste (RCD) is one of the major problems in the management of municipalities, as they cause significant impacts on the environment

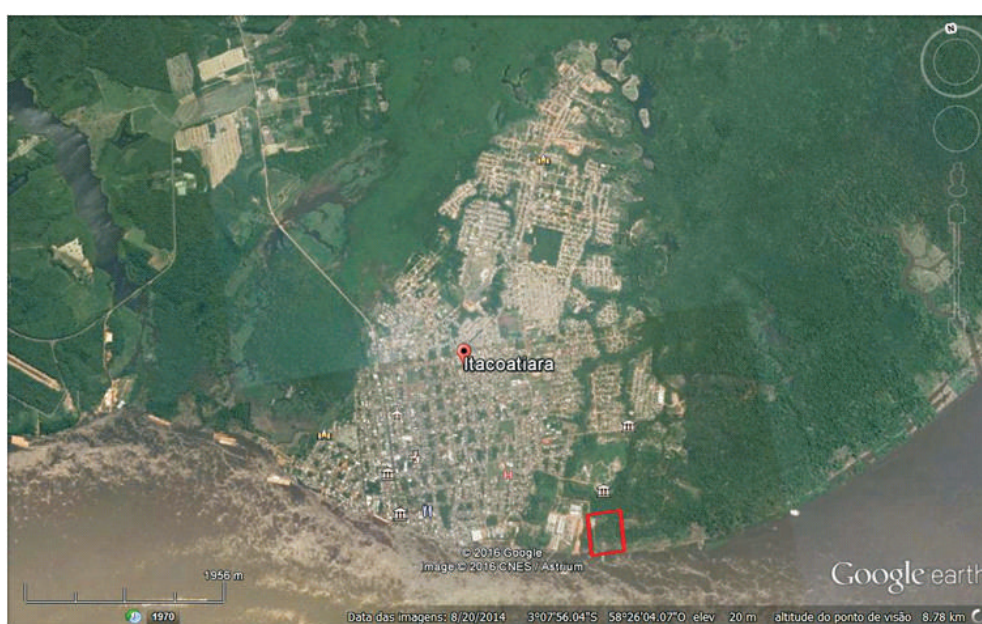


Figure 1. Location of the Municipality of Itacoatiara-AM

Source: Adapted from Google earth

RESEARCH PROCEDURE

The first part of the study focuses on the theoretical framework, consisting of articles, newspapers, books, scientific journals that will base the research on the practice of solid waste management by Municipal Managers and Construction Company operating in Brazilian municipalities. These theorists will contribute to conceptualize and explain what would be solid waste, management, laws and guidelines in the CONAMA resolution, environment and its aggravating factors, environmental impacts, pollutants and pollutants, among others.

Second part of the study refers to the stages of development in which it is divided into two phases: the first one refers to the diagnosis of the situation of the construction and demolition residues in the region under analysis, the municipality of Itacoatiara-AM. In this sense, a field research was carried out to identify the areas of irregular deposition of the construction and demolition residues (RCD), by means of a photographic record with the purpose of collecting qualitative data referring to the cargo movements, given final destination, types Equipment used, etc .; and second, the presentation of the Integrated Plan proposal for Construction Waste Management of the municipality concerned, the agents of the definitions involved and their responsibilities, pointing to the guidelines for waste management proposal.

RESULTS AND DISCUSSION

Possibilities for RCD and recyclable material applications by Municipal Managers and Construction Company operating in Brazilian Municipalities

From the data collected in the theoretical research, it was verified that in Brazil, the legislation referring to construction waste is Conama Resolution no. 307, of July 5, 2002, which establishes guidelines, criteria and procedures to be adopted by governments municipal and agents involved in the handling and disposal of the RCD, so that the environmental impact produced by these wastes are minimized (BRAZIL . , 2002; Tessaro et al, 2012) .The resolution CONAMA diretrizes para 307 establishes that local district and Federal develop and implement structured and sized from each local situation policies, and these policies take the form of an Integrated Plan for Construction and Demolition Waste Management (PIGRCD), incorporating necessarily (BRAZIL, 2002;. Tessaro et al, 2012): (A) Municipal Construction and Demolition Waste Management Program (PMGRCD), with the technical guidelines and procedures for The responsibilities of small generators and transporters; And (b) Construction and Demolition Waste Management (PGRCD) projects that guide, discipline and express the commitment of correct action on the part of the large generators of waste, both public and private. the main objective of not generating waste and subsequently the reduction, reuse, recycling and proper disposal (Tessaro et al., 2012).

The economic benefits of recycling as a substitute for RCD irregular depositions are clearly noted in urban cleaning costs for municipal administrations due to the high cost of irregular disposal, correction of ground deposition, and control of diseases costing on average \$ 10 / m³ RCD, from a cost 25% less for recycling (Lamb et al . , 2001; Tessaro et al, 2012.). One of recycled aggregate of using options is the use in flooring, which, besides the advantage of reducing the amount of waste in landfills, brings benefits such as (Leite et al, 2007;.. Tessaro et al, 2012) :(a) (B) small or no expansion, that is, with water inlet or saturation, there were no changes of volume in the compacted layers (D) improvement in the sanitation conditions of the municipalities and economy with the urban cleaning, collaborating with municipal solid waste management programs, and (c) gain of resistance due to self-cementing, due to the possible presence of pozzolanic activity;) Saving of natural mineral resources, due to the lower speed of exploration of the deposits, with consequent decrease of aggression to the environment, (f) reduction of the costs (G) the need for smaller areas for landfill and boot maintenance, due to the extension of the life of the existing ones; and (h) reducing energy consumption and generation deco 2 production and transport materials.

Accordinging Kartam et al. (2004) and cited by Tessaro et al. (2012), recycled RCDs can also be used as an aggregate for low-strength concrete, road paving, drainage or containment structures, the production of cement blocks, the manufacture of pre-cast blocks For paving of sidewalks, etc. The efficiency of RCD recycling can be improved if there is a set of instructions accompanied by technological advances and scientifically tested procedures. The combination of RCD with alternative synthetic materials has also been studied, such as strips or rubber grains from used tires and bottles Pressed PET. These materials can be used instead of natural granular materials in drainage systems. The presence of a geotextile involving alternative drainage material can serve as a filter element for the system. The use of these alternative materials, in addition to providing an environmentally friendly destination for such waste, can represent substantial savings in regions where conventional drainage materials are scarce or expensive (Palmeira, 2010).

Accordinging Scremim (2007) and cited Tessaro et al. (2012), the Construction and Demolition Waste Management Support System is a software developed to assist municipalities in the management of RCD. The software allows, through an interactive and accessible interface, functions such as provision of information regarding RCD to the Users, assistance in the diagnosis of RCD in the municipality and, from the diagnosis, proposition of management alternatives. With regard to the information related to RCD, the software provides the user with an explanation of the information needed to use the tool and how to collect the data Necessary for the diagnosis of RCD in the municipality. At this stage, spreadsheets and tokens are provided that are used to collect and record data related to the agents involved in the generation and collection of the RCD. After the user is familiar with the subject and has collected basic information about the RCD in the municipality , The information is recorded in the system that stores and processes that data. The system can be fed with data as they are obtained, thus forming a database with information such as: (a) register of the agents involved in the

generation of RCDs, (b) registration of the agents involved in the collection and transport (D) qualitative and quantitative characteristics of RCDs in the municipality; And (e) registration of areas that can be used for the installation of voluntary delivery points (PEV), transshipment and sorting (ATT) and landfill areas. After the diagnostic stage, the system provides information that can assist in the Actions for the correct management of this waste. It is suggested to the user to raise: (a) characteristics of the areas of ENP, ATT and landfill; (b) suggestions of final destination for each class of waste, through the provision of technical works of the area; And (c) examples of environmental education and inspection programs necessary for the implementation of other actions.

Diagnosis of deposition of solid waste (RS) in the Municipality of Itacoatiara-AM

In general, the State of Amazonas does not yet have a State Policy of SR, however, according to information from the State Secretariat for the Environment and Sustainable Development (SDS) of Amazonas, the sector that would be responsible for formulating the policy would be The Deputy Executive Secretary of Geo Diversity and Water Resources (SEGEORH), which also has the mission to promote the sustainable use of geo diversity and water resources (SDS, 2011). With regard to the panorama of the SR sector in the State, the interior still presents very precarious figures. In Itacoatiara-AM there is no integrated solid waste management (Figure 3). It is dumped in a landfill containing all kinds of waste without adequate treatment, such as: household waste, slaughterhouse waste, tree pruning, construction waste, among others. Due to the lack of selective collection sufficient to allocate the large volumes of waste generated daily by the company.



Figure 3. Garbage from Itacoatiara Municipality.

Source: Authors.

According to TCU (2012), the municipality has a legal framework for urban management (Master Plan, Posture Code, Environmental Code, Code of Works, etc.). In 2001 the city administration, through an agreement (SIAFI No. 432 825) with the Ministry of Environment (MMA) proposes the construction of a *terrosanitário*, an area of 847,000 m², the same location where the waste was deposited. However, the works carried out did not characterize the existence of a sanitary landfill (TCU, 2012). The project approved in the MMA consisted of the construction of slurry ponds and guardhouse; Acquisition of equipment (balance, crawler and bucket), as well as urbanization works. The landfill would be built in an area of 847,000 m², the same location where the waste was deposited. The agreement lasted from December 31, 2001 to April 30, 2003. However, slurry ponds were built, as well as the *guarita*, but everything is abandoned in the trash and undergrowth. The equipment is scrapped and abandoned and there is no trace of urbanization. There is also no evidence that the site has been operationalized as a Landfill.

According to TCU (2012), the collection service is carried out in 27 neighborhoods. The City also maintains the collection in the rural communities: Novo Remanso, Vila de Lindóia and Engenho. There is no quantification of waste generation, but only estimates. According to the City Hall, 196 tons of waste are collected per day. IPAAM data indicate a per capita generation of 0.5 kg inhab / day. The RSSS are collected by the City Hall in an appropriate vehicle for transportation. Although transportation meets the standard correctly, all health waste is dumped in the dump without any treatment. There are no ditches for the disposal of health waste.

According to TCU (2012), Itacoatiara has a Collectors Association composed of 25 people. During the DRS survey, scavengers were camped in improvised shacks along the access road and also collected recyclable / reusable waste without any protective equipment (Figure 4). Presence of waste pickers in the dumps exposes a social problem, a sad scenario, a situation of vulnerability, subject to risks not only in health, but also social risks. It is touching the situation of the children, evidenced by the lack of attendance and lack of school performance. Boys and girls lose the right to childhood, the possibility of studying, playing and raising new horizons.



Figure 4. Scavengers' shelter

Source: TCU (2011)

The interdependence of the concepts of environment, health and sanitation is now very degraded, which reinforces the need to integrate the actions of these sectors in order to improve the quality of life of the population. In search of an alternative that minimizes this problem, it is evident the importance of a project directed to the issues related to the social, economical and environmental aspects of solid waste in the Municipality of Itacoatiara (Figure 5).



Figure 5. Waste that could be used in social project.

Source: Authors.

The municipal wastebasket of Itacoatiara located at Rua Dr. Luzardo de Melo, (Coordinates 03 ° 08 '53.0 "S and 58 ° 25' 43.9" W), neighborhood of Jauari II, within the urban area since 1997. It occupies A land of 15 hectares the area is also close to Lake Canaçari and the Piramiri and Igaipauá streams that flow into the Amazon River. Since February 2011, the municipal administration, following guidance from the IPAAM, has initiated a process of remediation of the area, with access for circulation throughout the solid waste deposit, in order to facilitate the unloading, separation of waste by area and covering in trenches. Ditches were also built for the disposal of health waste and carcasses. The unloading point was transferred from the access road to the inner

part of the dump (TCE, 2012)

The results of this research are in agreement with the observations made. During the visit of the TCE technicians (2012) to the solid waste deposit in Itacoatiara for the survey report (Figure 6), the main failures were:

- A) Waste deposited without any type of separation treatment or coverage;
- B) Presence of residences within 100 meters (urban area) and an invasion area at the back of the dump;
- C) Bird risk, the garbage dump is less than 7km from the local airport in violation of CONAMA Resolution 004/95;
- D) Disordered waste discharge;
- E) Wastes without coating;
- (F) about 8.0 (eight) hectares of open-pit waste;
- G) Presence of scavengers mainly children;
- H) Inadequate burning of waste.



Figure 6. Solid waste disposal in Itacoatiara.

Source: Authors.

Deposition diagnostic Waste Construction and demolition - RCC in Itacoatiara-AM Municipality

Construction and demolition waste (RCC) are basically composed of remnants of buildings and works in general. Subdivided into two groups: Class "A" and Class "B". In the Class "A" group there are 19 masonry, mortars, concrete, asphalt and soil, and can be reused or recycled. They make up on average 80% of the total composition generated. In the Class "B" group packaging, pipes, wiring, metals, wood and gypsum, also reusable or recycled for other uses. They correspond on average to 20% of the total generated, with half being debited to the timber (MMA, 2011). It is estimated that there is a ratio in the generation of RCC and RSD of approximately two to one, and average for typical per capita generation of 520 kilos per year, which can be higher in municipalities with a stronger economy and reduce in poorer municipalities. Considering the apparent density, RCC undifferentiated equivalent to 1,200 kg / m³, and "A" class of 1,400 kg / m³ and Class "A" ground 1,500 kg / m³ (MMA, 2012, p.55). In this sense, it was verified that disposal of the waste generated in the construction site is done in buckets (figure 7), and these are located at the door of the work, and later are sent to the landfill Itacoatiara or Manaus and other places not informed In boats (Figure 6 and 7). And the collection is done every 2 days, by the disk buckets. The justification of the company for not recycling waste, is that the city does not offer any support for this type of activity are very in areas of permanent preservation (APP), near water courses and area várzea. Em Itacaatiara is It is very common to see these wastes deposited in inappropriate places, such as clandestine boot-off, on the banks of the streams, in vacant lots far from the city. This causes silting of the banks of the waterways, as well as the clogging of manholes and galleries, producing environmental and social problems.



Figure 7: Deposition of construction site waste.

Source: Authors

By simply disposing of this debris, it ends up wasting a material that could have been reused. One of the materials that can be reused in the work itself is of mineral origin. From the generation and collection, in the worksite recycling the mineral debris is sent through pipelines to a mini processing center, where it is crushed to be normally used as aggregate. The main advantage of processing and reusing the waste in the very site where they were generated is the economy, reducing the cost of the work. The fact that the construction company does not have to discard a material for which it has already paid and the reduced cost of transporting it are the main reasons. "If processing is done at the site, there is a reduction in the volume of rubble per tonne." This fact would reduce the expense of the builders with the removal of the debris, if it is necessary to reuse it in another work. As it is estimated that only 20% to 25% of the waste is generated by the builders (the rest would be the responsibility of self-), Recycling at the site would not have a very significant impact on the urban problems caused by the rubble. For this reason, several cities are already studying the creation of waste recycling plants.

There is a deep relationship between the flows and the stocks of the materials of the site, the event of generation of waste. Therefore it is important to note:

- Proper conditioning of the materials (figure 8) is of extreme importance for the storage of the various materials, obeying basic criteria of:

I - classification;

II - frequency of use;

III - maximum stacking;

IV - distance between the ranks;

V - alignment of the batteries;

VI - distancing of soil;

VII - separation, isolation or involvement by slats, cardboard, styrofoam etc.

VIII - preservation of the cleaning and protection against the humidity of the place.

Good organization of material storage spaces makes it easy to check, control inventory and optimize the use of inputs. Even in tight spaces, it is possible to carry out an adequate packaging of materials, respecting criteria of:

I - intensity of use;

II - distance between stock and places of consumption;

III - preservation of the operational space.

Materials classified for reuse must meet the criteria listed above.



Figure 8. Deposit of materials

Source: Authors.

- The organization of the site and its advantages (Figure 9): Good organization means avoiding waste in the use and acquisition of replacement materials. In cases, the materials are scattered throughout the work and end up being discarded as waste. The execution of the services in the work ends up transforming into a large warehouse, being able to have "leftovers" of scattered supplies and about to become waste. A prática de circular pela obra sistematicamente, visando localizar possíveis "sobras" de materiais para reavê-lá de forma classificada e novamente disponibilizá-los até que se acabem, pode gerar economia substancial. Isso permite reduzir a quantidade de resíduos gerados e aperfeiçoar o uso da mão de obra, uma vez que não tem a necessidade de transportar resíduos para disposição. A redução da geração de resíduos também envolve redução dos custos de transporte externo e destinação final.



Figura 9. Armazenamento dos materiais

Fonte: Os autores.

- Planning the disposal of waste (Figure 10): In the space of the preparation of the construction projects, the disposal of the waste should be considered, considering the aspects related to the different packaging and the definition of efficient flows, as the next items approach.



Figure 10. bay photo

Source: Authors

In Itacoatiara, there are approximately 10 companies involved in the collection of civil construction waste registered in the Municipal Secretariat of Public Cleaning - SEMULSP, which operate the waste market, according to data provided by the Secretariat itself dated October / 2016. Large parts of these materials are destined directly for the municipal sanitary landfill, given that some of the land that was destined for this boot-out ceased operations due to lack of environmental documentation that is fundamental to the operation. Another important fact is that there are also different companies For boot-off and those for reuse and recycling of construction waste, as they have the following characteristics:

A) Reuse and recycling of construction waste: Seek the separation and final destination of construction waste, taking into account reuse and recycling. The few that have licensing only receive the waste, when they are not also hired to demolish buildings, including in the service provided to the destination of the waste generated.

B) Boot-off: it is limited to the licensing of an area for depositing useless waste that has no use in construction, such as contaminated, saturated and other soils. These types of waste can not be sent to licensed companies for the reuse and recycling of construction waste, since it is a different activity / service.

C) Collection of solid waste from civil construction: most of them only carry waste, having as one of the licensing requirements, proof of final destination for areas or companies licensed to receive specific waste from civil construction.

In the municipality of Itacoatiara, the issue has its own characteristics which can be addressed as:

- The historical environmental education of the municipality, in which late urbanization can be considered and, in this way, with great need for the management of construction and demolition waste.
- Due to its geographic condition, since it is almost always surrounded by rivers, forest areas, the existence of adequate disposal sites for such waste and those that currently exist do not present a waste management plan, thus stimulating clandestine sites Which reduces the quality of life and increases the costs of urban cleaning and maintenance.

In general, the municipality of Itacoatiara-AM has a positive aspect in relation to cleanliness, mainly due to the services of sweeping, weeding and pruning, carried out in a regular way, which does not correspond to the precarious reality of the dump that does not have Any form of remediation of the negative environmental impacts beyond the free access of the collectors populations in conditions of total insalubrity. Although the urban cleaning takes place on a regular basis, the hordes for the later collection, when this service is delayed, end up becoming boot-stops since the population takes advantage to discard all kinds of materials in these halls, thus hindering the possibilities Reuse (composting). With regard to bulky waste, the municipality carries out sporadic operations according to the advent of the demands, in the so-called "clean-up workplaces" that occur at least twice a year, when the general population discards household appliances, furniture, Remnants of pruning done on their land. The heaps are usually arranged in all urban roads of the cities and districts, and are concomitant

with a more aggressive weeding that includes besides sidewalks and guides, the cleaning of vacant lots and other public spaces. The uprights are generally collected with the use of mechanical shovels and bucket trucks. As for construction waste, there is a peculiar situation. The municipalities carry out sporadic collections according to the advent of public works, however it is common that such services are extended to a small percentage of individuals without the collection thereof. On the other hand, it is common for individuals to dispose of these materials on the ground as paving or leveling. Only the municipality of Manacapuru has autonomous agents that offer buckets, popularly known as "Disk-Entulhos". Although industrial solid waste (RSI), agrosilvo-pastoris and solid waste from the health services (RSS) is the responsibility of the generators (BRASIL, 2010a), the three municipal governments do not have specific regulations or some form of collection Differentiated, all being dumped in the dump next to the other RS. Perhaps it was the ideal time to regularize and review shared accountability to these sectors, including setting fines based on existing standards.

Regarding legal compliance, Iranduba and Manacapuru were in the attention stage while Novo Airão was in a favorable stage. However, regardless of the results, it was clear that the problem is not in the existence of the legislation itself, but in the fulfillment of the same. In this sense, the three municipalities have legal mechanisms that govern Municipal Councils for the Environment, but only Novo Airão has held some meetings with the most effective participation of institutions external to the municipal public power. The existence of the dumps, in a way, proves a certain permissiveness around the legal processes of interdiction by the oversight agencies and licensors like IPAAM and Public Prosecutor. Regarding the environmental impacts of the dumps of each municipality, despite the alarming figures of the three municipalities, Iranduba was still the Municipality that complied with some of the recommendations made by the IPAAM as the overlap of the RS masses in general. However, the situation of the municipalities of Manacapuru and Novo Airão are extremely worrisome since they present similar negative aspects with a more serious picture in Manacapuru due to the size of the area and the amount of scavengers in the place. Both dumps would require immediate intervention. Therefore, it is concluded that the three municipalities only manage some of the services of the system, practically maintaining the same modus operandi already executed by most Amazonian municipalities.

CONCLUSIONS

As a result of this diagnosis, there is a clear need to implement a CDM management plan in the municipality of Itacoatiara-AM, following the principles described in Law 12,305 / 10, regulated by Decree No. 7.404 / 10, in order to To treat selective collection as a fundamental instrument for the success of the National Policy on Solid Waste. In this sense, it can be seen that the software "Support System for the Management of Construction and Demolition Waste" can be an important alternative to obtain the necessary information for data collection in the diagnosis of RCD in the municipality.

On the other hand, it will be necessary to develop a plan for the social insertion of the collectors, with the articulation of their activities with a selective collection system, involving environmental awareness and education, including institutions such as schools, universities, churches and other influences on the community. This proposal will aid the adaptation of the landfill into a controlled landfill until the design of a Landfill project to be implemented in a compatible area for the activity, recovery of the area currently used as a deposit, drainage installation and treatment of gaseous and liquid effluents; The water table of the area by means of piezometric wells and present conclusive technical reports; To adopt, immediately, adequate procedures for the collection, transportation and final destination of the RSSS - Solid Waste of Health Service; Provide due environmental licensing of the area defined for the construction of the future landfill, as well as the technical studies and the landfill project; Conjugate the normative, planning, operational and financial actions to structure the selective collection system in the municipality; With private companies in order to generate mechanisms and incentives for recycling to potentiate the market for recyclables in or out of the municipality.

It is hoped that this diagnosis will serve as support for the implementation of this management plan by the local authorities, thus contributing to compliance with legislation and, consequently, to the preservation of the environment.

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