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ENVIRONMENTAL EDUCATION AS A TOOL FOR RAISING AWARENESS OF THE PROBLEM OF SOLID WASTE IN THE RESEX MARINHA MESTRÉ LUCINDO

EDUCAÇÃO AMBIENTAL COMO INSTRUMENTO DE CONSCIENTIZAÇÃO PARA A PROBLEMÁTICA DOS RESÍDUOS SÓLIDOS NA RESEX MARINHA MESTRE LUCINDO

EDUCACIÓN AMBIENTAL COMO HERRAMIENTA DE CONCIENCIACIÓN SOBRE LA PROBLEMÁTICA DE LOS RESIDUOS SÓLIDOS EN LA RESEX MARINHA MESTRÉ LUCINDO

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ABSTRACT

The rampant generation of solid waste and its resulting disposal on slopes has been a major problem in marine extractive reserves (RESEX). Local populations, culturally and emotionally connected to the site and who sustain themselves through extractive activities, can become key allies in preserving forest balance, as they sustain themselves with goods produced by the ecosystem itself. Environmental education contributes to the conservation of these areas by encouraging the population to conserve them. In this context, this study sought to analyze the environmental perceptions of residents of the Vista Alegre district in the municipality of Marapanim, Pará, regarding the mangroves. Data collection included semi-structured questionnaires and environmental education initiatives, such as meetings and cleanup drives, stemming from a partnership between the government and the public sector. Through short interviews conducted after the initiatives, it was possible to identify that the community understands its role in environmental conservation, and the government understands the need to implement more initiatives focused on good environmental practices in conjunction with residents of local communities. Furthermore, the cleanup campaign provided a broader perspective on the need for cooperation between governments to change local realities.

Keyword: Solid Waste. Environmental Education. Environmental Perception.

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RESUMO
A geração desenfreada de resíduos sólidos e o decorrente descarte nas encostas têm sido uma grande problemática em Reservas Extrativistas (RESEX) marinhas. Populações locais, vinculadas culturalmente e afetivamente ao local, que se sustentam com atividades extrativistas, podem se tornar grandes aliadas em atividades de preservação do equilíbrio florestal, pois se mantêm de bens produzidos pelo próprio ecossistema. A educação ambiental contribui para a conservação dessas áreas ao incentivar a população a conservá-las. Neste contexto, este trabalho buscou analisar a percepção ambiental dos moradores do distrito de Vista Alegre no Município de Marapanim - PA com relação ao mangue, tendo como instrumento de coleta de dados a elaboração de questionários semi estruturados, além da realização de ações de educação ambiental, como reuniões e mutirão de limpeza, oriundos de uma parceria entre poder público e sociedade, onde foi possível identificar, por meio de pequenas entrevistas realizadas posteriormente as ações, que a comunidade entende seu papel na conservação do meio ambiente, e o poder público entende a necessidade da realização de mais ações voltadas para as boas práticas ambientais em conjunto com moradores de comunidades locais. Além disso, a realização do mutirão de limpeza trouxe uma visão mais ampla quanto a necessidade da cooperação entre governanças para a mudança da realidade local.

Palavras-chave: Resíduos Sólidos. Educação Ambiental. Percepção Ambiental.

RESUMEN
La generación descontrolada de residuos sólidos y su consiguiente disposición en laderas ha sido un problema importante en las reservas extractivas marinas (RESEX). Las poblaciones locales, cultural y emocionalmente vinculadas al sitio y que se sustentan mediante actividades extractivas, pueden convertirse en aliados clave para preservar el equilibrio forestal, ya que se sustentan con los bienes producidos por el propio ecosistema. La educación ambiental contribuye a la conservación de estas áreas al incentivar a la población a conservarlas. En este contexto, este estudio buscó analizar las percepciones ambientales de los residentes del distrito de Vista Alegre, en el municipio de Marapanim, Pará, respecto a los manglares. La recopilación de datos incluyó cuestionarios semiestructurados e iniciativas de educación ambiental, como reuniones y campañas de limpieza, derivadas de una colaboración entre el gobierno y el sector público. Mediante breves entrevistas realizadas después de las iniciativas, se pudo identificar que la comunidad comprende su papel en la conservación ambiental, y el gobierno comprende la necesidad de implementar más iniciativas centradas en buenas prácticas ambientales en colaboración con los residentes de las comunidades locales. Además, la campaña de limpieza brindó una perspectiva más amplia sobre la necesidad de cooperación entre los gobiernos para transformar las realidades locales.

Palabras clave: Residuos Sólidos. Educación Ambiental. Percepción Ambiental.

1 INTRODUCTION

The Lucindo Marine Extractive Reserve (RESEX) was created through Decree s/n of October 10, 2014. The reserve is located in the municipality of Marapanim, the municipality belongs to the northeast of Pará, also known as the salt region. The RESEX takes its name in honor of Lucindo Rabelo da Costa, a great icon of Marapanim's musical culture.

The RESEX emerged from the social struggles during the 1970s and 1980s in the Amazon, the first RESEX created in Brazil was the Alto Juruá Reserve, in 1990, in the state of Acre, instituted after the murder of environmental activist Chico Mendes, in 1988, while the first Marine RESEX was created in 1992, on the coast of Santa Catarina, and it is called Pirajubaé.

The Brazilian Amazon is home to populations in environments with different natural resources and that have developed different ways of life and use of these resources, the need to create legal mechanisms for the protection of these populations, their ways of life and cultural practices, took shape from the creation of the National System of Conservation Units (SNUC), which presented the concept of Extractive Reserves, which are conservation units of sustainable use, which integrate residents and users of resources in their management (SILVA JUNIOR et al., 2019).

The creation of Marine Extractive Reserves (REM) are tools to preserve the environment from accelerated degradation caused by the irresponsible exploitation of natural resources. According to Pimentel (2019), the REM are new territories and involve the multiterritorialities of the peoples of the coastal zone, and were implemented with the perspective of mitigating environmental impacts by predatory use of resources from the ecological set of mangroves, linked to the great ecological and social importance, with a view to establishing integrated and participatory management between government institutions and extractive populations.

From the perspective of Pimentel (2019), the territory of a RESEX is divided into agents of domination and appropriation, the agents of domination are represented by the public power, such as Federal Government Institutions (IBAMA, INCRA, ICMBio), State (SEMAS, EMATER), Municipal (CITY HALLS AND SECRETARIATS) and Government (NGOs). The agents of appropriation are the local communities, which use the rivers, the mangrove swamp and its resources for food and a source of income, and which over the years have built representations, meanings and identity of the region.

The communities that live within the REM are largely composed of fishermen, shellfish and crab gatherers, family farmers who depend directly on the natural resources extracted from the RESEX to survive. Environmental degradation within marine RESEX is becoming

more and more notorious, threatening the source of food and income of the local community that depends on mangroves and rivers.

The vast majority of REM are located in rural areas, where the problem of solid waste becomes even more pronounced, due to the lack of waste collection and the lack of sanitary landfills, causing waste to be disposed of irregularly in mangroves. Alencar and Sousa (2019), point out that the lack of waste collection in rural areas leads residents to dispose of it on their own, in certain locations, in the summer period, residents burn waste, while in rainy periods, the practice is to bury waste.

Environmental education is a tool that helps to bring out the population's environmental perception, directing them to a healthier relationship with the environment. Environmental education seeks, among other aspects, to generate a new behavior that aims to link knowledge about the environment and the daily life of communities, in order to raise awareness and arouse interest in the environment. (BRAGA; SILVA; RODRIGUES, 2020).

For Vieira (2017), the links that extractivist populations have with nature can contribute to the construction of an Environmental Education, beyond formal spaces, constituted with everyday life. Also according to the author, Environmental Education needs to offer understandings that society has different relationships with nature, that is, an environmental education based on culture and the sense of belonging that extractive populations have with nature.

Education in conservation units contributes to the conscious action of the local population in the face of environmental problems, causing the duty to protect and conserve the place where they live. (BRAGA; SILVA; RODRIGUES, 2020). In this perspective, the objective of this study is to analyze the environmental perception of the residents of the Mestre Lucindo Extractive Reserve and to develop an Environmental Education action in the territory, aiming at raising awareness about the proper disposal of waste and the promotion of good practices for the preservation of the environment.

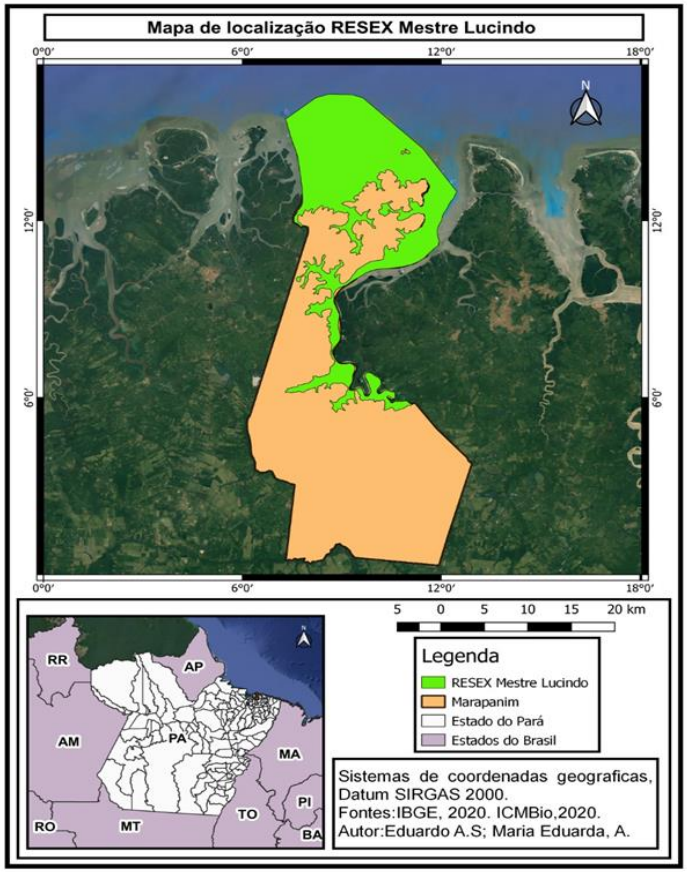
2 METHODOLOGY

2.1 CHARACTERIZATION OF THE STUDY AREA

The RESEX Mestre Lucindo occupies an area of 26,464.88 hectares, is inhabited by 29 communities (Figure 1), and its management council is made up of 23 institutions. This REM began its operation on April 20, 2018, its social and community organization is structured in eight poles, each of which has a management committee, which is divided into community associations and the main Association, called the Association of Users of REM Mestre Lucindo (CANTO et al., 2020).

Figure 1

Location map RESEX Mestre Lucindo



Source: Authors, 2021.

The first conversations related to the creation of a RESEX in the Marapanim region began in 2005, but it was on April 13, 2013 that the first meeting took place with representatives of the Leadership Committee of the Fishing Peoples of Marapanim, led by representatives of ICMBio on the creation and management of conservation units. The creation of the RESEX was the target of an institutional and organizational power dispute between community leaders and local non-governmental organizations, because for the residents the creation of a RESEX could bring improvements to the local economy (BRASIL, 2014).

According to Canto et al. (2020), the main conflict in the Mestre Lucindo Extractive Reserve is related to fishing and the use of mangroves in crab harvesting and preservation of riparian forests. The problem is more accentuated due to the lack of dialogue and cooperation between representatives of the council and the communities and poles with institutions linked to fishing and crab gathering issues.

Another conflicting factor is the irregular disposal of solid waste within the RESEX, as residents dump the waste directly into the mangrove swamp or burn it, which can result in fires within the RESEX. The lack of regular waste collection is a determining factor for

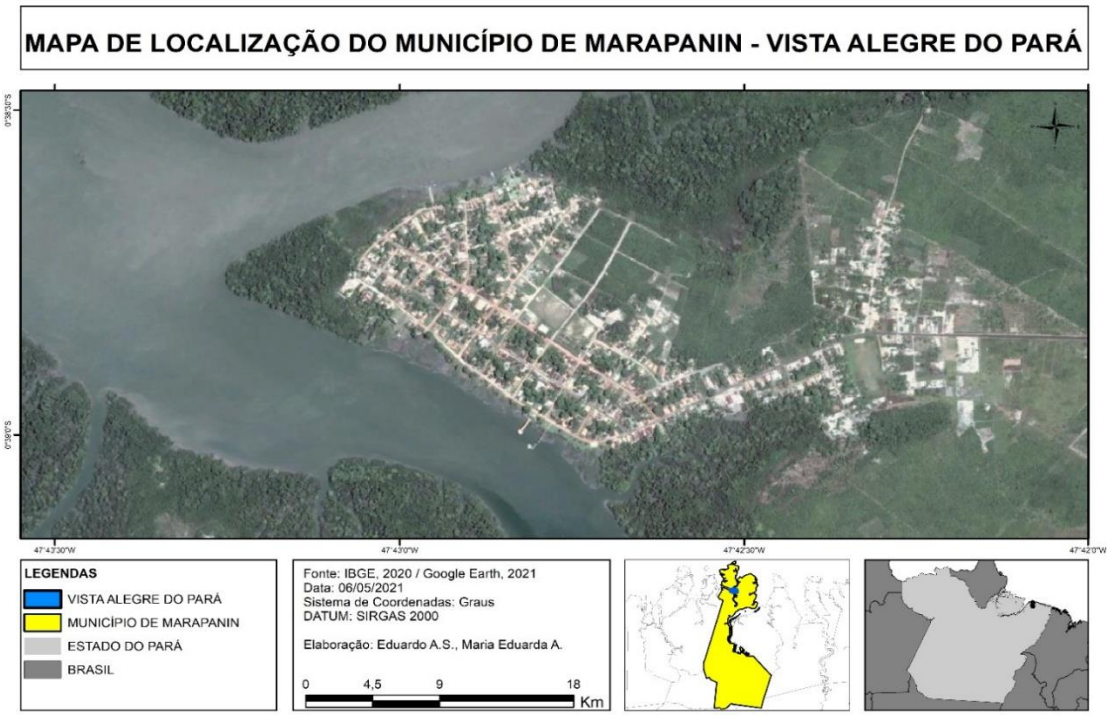
incorrect disposal to occur. Canto et al. (2020) point out that there is no prospect of a solution to the conflicts, due to the lack of interaction between the subjects involved in the management of the RESEX, indicating a low level of social management.

The localities that make up the REM Mestre Lucindo have exuberant beaches, which are a destination for many tourists, which accentuates the devastation of the coastal vegetation that is located near the beaches, stimulates the opening of roads and real estate speculation. These factors caused by disorderly tourism cause negative impacts on the ecosystem that constitutes the coastal landscape of REM Lucindo, such as the devastation of mangroves and sandbanks (CAMPOS; BIRTH; MENDONÇA, 2017).

This research was carried out in the district of Vista Alegre, where a part of the Marine Extractive Reserve of Mestre Lucindo is located, belonging to the municipality of Marapanim, located in the Mesoregion of the Northeast of Pará, microregion of Salgado (Figure 2). Created in October 2014 due to its unique social, cultural and tourist characteristics, it totals 26 thousand hectares of area, where it houses several traditional communities that value the sustainable use of the natural resources existing there.

Figure 2

Location map of Vista Alegre district



Source: Authors (2021).

The district of Vista Alegre (better known as Vila de Vista Alegre) is located northwest of the Municipality of Marapanim, access to the district can be made by land and water. By

land, access to the locality is carried out by PA 318 that connects Marapanim to the District of Vista Alegre do Pará. The district is surrounded by mangroves and the Cajutuba and Camará rivers that surround it the entire length of the shore that is composed of wooden and concrete piers for mooring vessels, it also has a ramp used for vessels coming from other municipalities or for landing fish, because Vista Alegre serves as a reference point for residents of the islands near the district for different activities, Among them the sale and purchase of fish, access to the health center, sports and leisure activities, etc. The Cajutuba and Camará rivers are essential for the residents, as they are the rivers that supply a large part of the food consumed by the local population, through the exploitation of fish, the extraction of crabs, oysters, shellfish, mussels and others.

According to Abreu (2011), it is estimated that there is a population of approximately 3,000 inhabitants, comprising between 400 and 500 existing families. Its population is basically made up of artisanal fishermen (rural fishermen), shellfish and crab collectors, family farmers with small swiddens. There are three neighborhoods in the interior of the village: 1. Pedreira; 2. Central; 3. Suraba, which develop parallel to the main streets of the waterfront, in front of the Cajutuba and Camará rivers. It is worth noting that the Northeast of the State of Pará is characterized by its diversity in terms of morphology and vegetation, especially in the coastal zone, in which estuarine areas stand out for having a vegetation cover with a predominance of mangroves (BRASIL, 2014).

2.2 METHODOLOGICAL PROCEDURES

This research is characterized as descriptive, where, according to Almeida (2006), it seeks to describe the characteristics of a certain population or phenomenon, or to establish relationships between variables. In addition, they involve standardized data collection techniques (questionnaire, observation), and generally take the form of a survey. The research method, on the other hand, will follow a case study model, which Pereira et al. (2018), define as a description and analysis as detailed as possible of a case that presents some particularity that makes it special, this type of study can bring a wealth of data and information contributing to the knowledge in the area of knowledge that if used. Thus, the methodological path took place in 7 stages:

1. BiblioFigureic survey;
2. Technical visit;
3. Preparation of the questionnaire;
4. Determination of the sample size and application of the questionnaire;
5. Analysis of the data obtained and elaboration of environmental education actions;

6. Carrying out actions together with the community;
7. Evaluation of the expected results.

The research process began with the biblioFigureic survey and recognition of the study site through a technical visit, where it was possible to identify the real problem and the main points of accumulation of solid waste on the slopes. During the month of June, a closed questionnaire was prepared that would be applied to the population living within the delimited study area.

According to Aragão and Mendes Neta (2017), the questionnaire is characterized by a set of questions addressed to the probable informant(s), the researcher must formulate a series of clear, direct and objective questions, eliminating subterfuges and doubts of any kind. This makes it much easier to organize the data (responses) in a tabular model for the purpose of categorizing, quantifying, and analyzing the survey data. It is worth noting that the application of the questionnaire was intended to obtain qualitative and quantitative data. For Yin (2015), qualitative and quantitative methods are not mutually exclusive and can be important, complementing each other and allowing a better understanding of the phenomena under case study.

49 questionnaires were applied, 1 questionnaire per family, directed to residences that are close to the edge of the district, consequently houses that have constant access to the mangrove. The questions asked in the questionnaire focused on the disposal of solid waste, the relationship that the community has with the mangrove and the resident's perspective on its future.

Additionally, a meeting was held with the Municipal Department of the Environment (SEMMA) of Marapanim, to discuss the possibility of holding the event, define competencies and establish a work schedule. The meeting was held with stakeholders, academic staff and SEMMA, on the occasion the team met with representatives of the Marieta Nunes State School (Figure 3) to discuss the role of the school community in preserving the environment and take the invitation to the joint effort, at the same time, the dissemination of the action was carried out that took place together with representatives of the community through consultations, home visits and dissemination on the local radio.

Figure 3

Meeting with school representatives and dissemination of the task force

Source: Authors, (2021).

Therefore, with the help of the Municipal Environment Agency, school representatives and volunteer residents, they met to carry out the cleaning effort. The meeting point was at the Municipal pier, with a meeting to inform the route and for the distribution of equipment to carry out the activity, such as gloves, plastic bags and *bags* (Figure 4) to store the waste collected.

Figure 4

Plastic bags, gloves and plastic bags

Source: Authors, (2021).

The volunteers covered the entire delimited area, and the collected waste was packed in the bags, until it was collected. Hours after the action was completed, the waste collected was collected by the city hall to give it final destination. On the occasion, 20 volunteers participated and the waste removed from the mangrove along the route was deposited in the Bags. (Figure 5).

Figure 5

Bags and handling

Source: Authors, 2021.

After the end of the cleaning effort, a simple interview was conducted with some of the participants, to understand how important the task force was for the community and public agency and how actions like this can influence environmental awareness, especially related to the incorrect disposal of solid waste.

3 RESULTS

3.1 SOCIOECONOMIC PROFILE OF THE RESPONDENTS

The mean age of the respondents was 51.1 years, they were in the age group of 19 to 86 years, the gender of the respondents corresponds to (51%) men and (49%) to women. The number of residents per residence is on average 4 people, the length of residence ranged from 1 year to 86 years (31.8 years on average). The professional occupations were varied: retired (30.61%), informal work (20.4%), formal work (14.28%), fisherman and shellfish picker (14.28%), unemployed (18.39%), pensioner (2%).

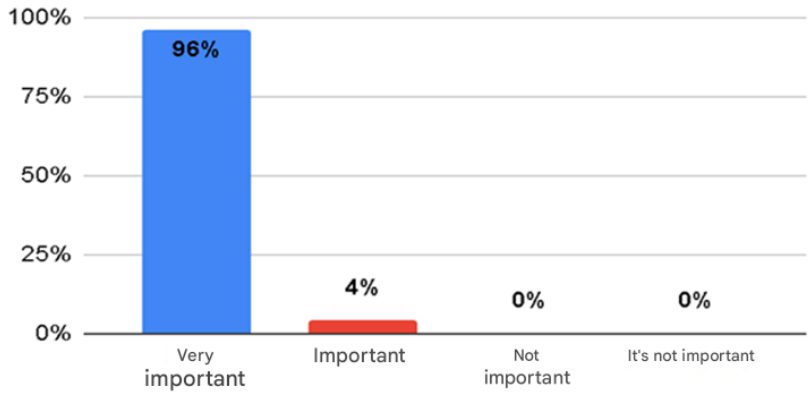
The average salary income of the respondents was R$921.00. Regarding education, it was found that (39%) of the respondents completed high school, (12%) did not complete high school, only (8%) completed elementary school, (37%) did not complete elementary school, (2%) completed higher education and (2%) are illiterate. This is similar to data found in other studies of Brazilian municipalities and communities, carried out by Pires et al., (2016), Godoy and Souza (2018) and Coelho, Lucas and Sarmento (2020).

3.2 RESPONDENTS' ENVIRONMENTAL PERCEPTION

The results obtained from the analyses referring to the environmental perception of the respondents revealed that the population understands the importance of the mangrove and the negative effects of the irregular disposal of solid waste in the mangrove. When asked about the importance of the mangrove (96%) of the respondents stated that the mangrove is very important (Figure 6), another question was asked in relation to the effects of solid waste dumped in the mangrove, (96%) of the respondents believe that the waste dumped in the mangrove results in problems for the environment (Figure 7).

Figure 6

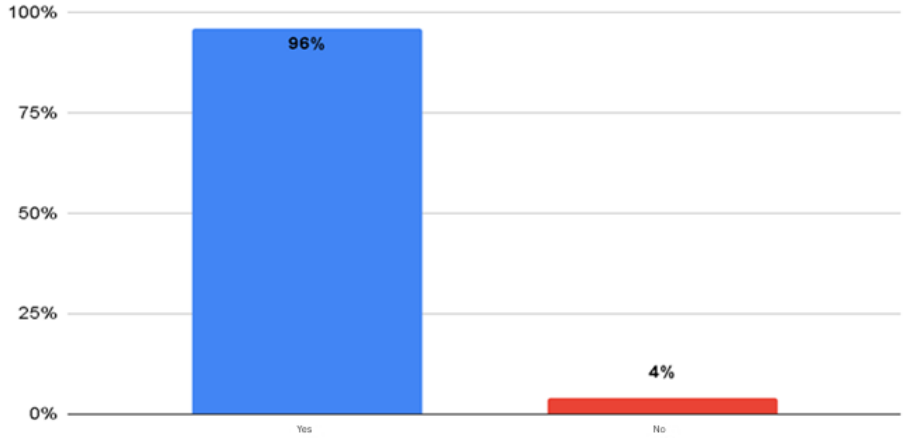
Question "How important is the mangrove for you?"



Source: Authors, (2021).

Figure 7

Question "Do you think that the garbage thrown into the mangrove brings problems to nature?"



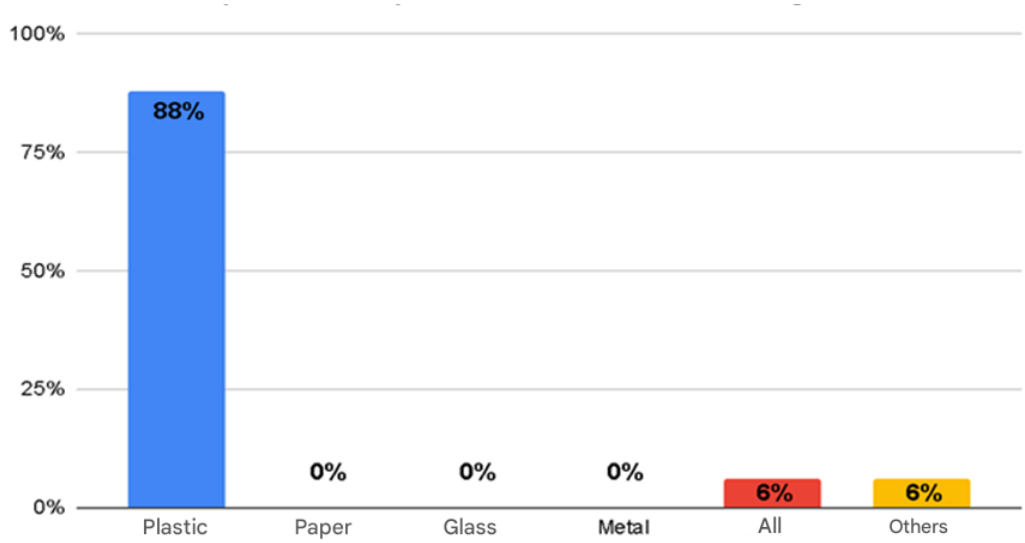
Source: Authors, (2021).

In the research carried out by Assis et al. (2020), in the Soure Marine Extractive Reserve, it was shown that 98% of informants have a high perception of the mangrove swamp and recognize the influence of solid waste on the environment. Because, for some residents, the mangrove is extremely important, not only for the provision of food, but mainly for the continuity of some species. The data obtained reflect the great sociocultural significance of the mangrove for the local community, as part of the food consumed daily by the community is taken from the mangroves and rivers that surround the district of Vista Alegre.

Regarding the types of solid waste that are frequently found in the mangrove, 88% of the interviewees answered plastic (Figure 8). The population reported the large number of pet bottles found in the mangrove swamp and during the inspections in the study area it was possible to verify the large presence of plastics of all types in the entire area of the site that surrounds the district of Vista Alegre, however, the presence of pet bottles is high in relation to other types of plastic materials (Figure 9). According to reports from residents, this happens due to the lack of waste collection by the government, the Marapanim environment department informed that the collection is carried out once a week, however, the residents oppose this statement, reporting that the collection is not done once a week, This goes beyond the collection deadline informed by the Department of the Environment.

Figure 8

Question "What type of garbage do you find the most in the mangrove?"



Source: Authors, (2021).

Figure 9

Pets bottles in the mangrove

Source: Authors, (2021).

During the application of the questionnaires, the residents revealed that, due to the inefficiency of waste collection, they burn it, which is carried out in their backyards or on the banks of the river where the mangrove is located (Figure 10). Others reported that they leave the waste in the right places on the day of collection, but that they end up in the mangrove swamp due to lack of collection.

Figure 10

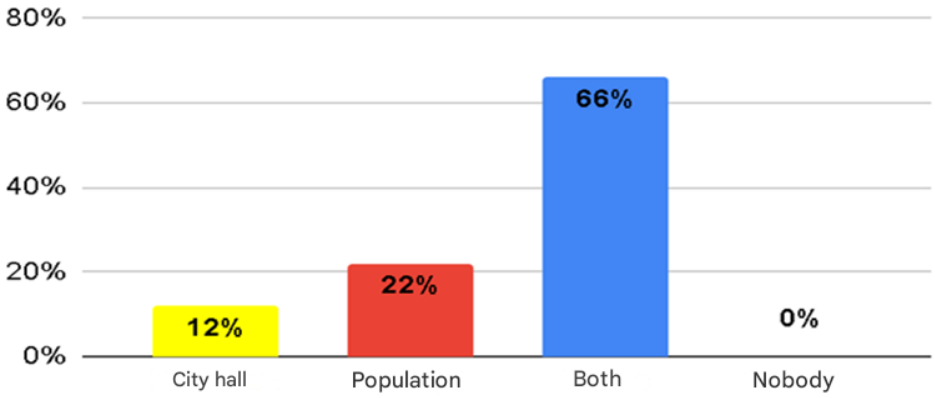
Waste burning site

Source: Authors, (2021).

When asked about who has the duty to take care of the mangrove, 66% of the respondents said that both the population and the city hall need to take care of the mangrove (Figure 11), indicating that the population is aware of its role in relation to the preservation of the mangrove. According to Assis et al. (2020), populations have a high perception of the influences of solid waste in their daily lives, but the little government assistance and the lack of a management program for this waste do not allow them to use effective strategies in their proper destination.

Figure 11

Question "Who do you think has the duty to take care of the mangroves?"



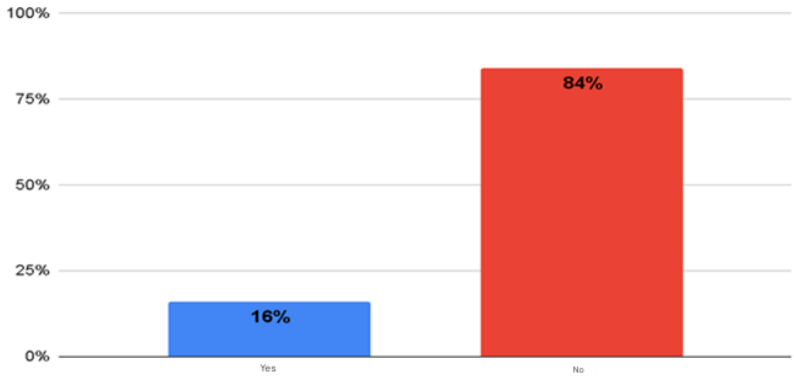
Source: Authors, (2021).

In meetings with the local environmental secretariat, the deficiency in the scope of preservation actions in the region was exposed, due to the insufficient number of technicians, and this factor makes it difficult to carry out preservation measures and actions throughout the municipality of Marapanim.

When asked about the existence of an environmental protection area in the place where they live, 84% of the respondents stated that they were unaware of the existence of protection areas in the district of Vista Alegre (Figure 12). This result is similar to the work of Coutinho et al (2015), carried out in the REM of Itaipu, where 78% of the interviewees answered that they did not know any RESEX close to their homes.

Figure 12

Question: "Can you tell if the municipality you live in has any environmental protection area?"



Source: Authors, (2021).

Regarding the question "Do you think it is important to have an environmental protection area in the place where you live?", 100% of the respondents stated that they believe it is important to have a protection area in Vista Alegre. Then it was asked, "Are you interested in participating in an environmental education action?", 90% of the respondents said they are interested.

The results obtained indicate that the residents have a high understanding of the importance of protecting and preserving the environment, however, it becomes notorious that there is a great problem when the vast majority of the respondents do not know that the place where they live is an environmental protection area, even if there is an indication (Figure 13), the term extractive reserve is still unknown to the local population.

Figure 13

Indication plaque of the RESEX Marinha Mestre Lucindo

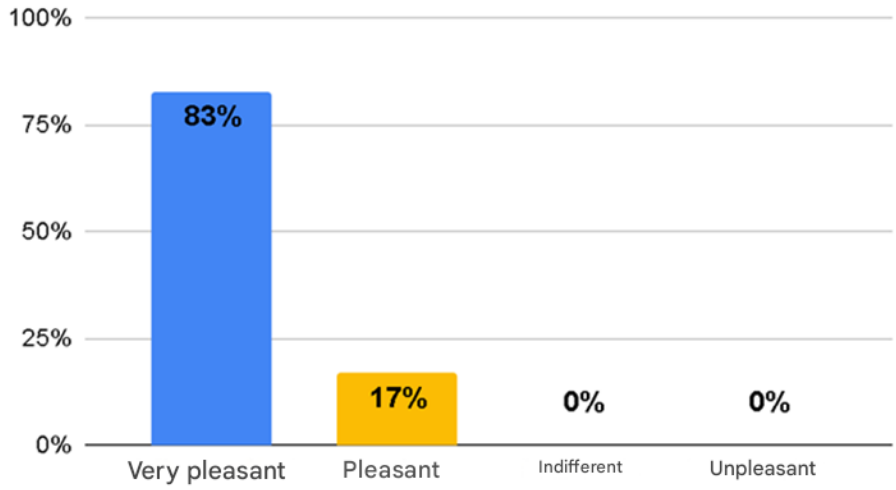
Source: Authors, (2021).

According to Coutinho et al. (2015), there is a need to disseminate the implementation of the RESEX to the population and promote environmental education projects for greater clarification. From this perspective, it is essential that there is a greater approximation between the managers of the RESEX and the community, through meetings and environmental education actions, the results obtained show that the population is interested in protection and offers itself as an agent of protection practices, however, there is a lack of tools that bring this community closer to environmentally correct practices, which would consequently result in a decrease in the incorrect disposal of solid waste.

When asked about the feeling that the place where they live provides, 83% answered that it is very pleasant (Figure 14). Similarly, Pires et al. (2016), investigating the perception of the residents of Parque do Bacaba in relation to the benefits that the park provides, the majority (81%) stated that the Park brings benefits to their lives.

Figure 14

Question "What feeling does the place where you live give you?"



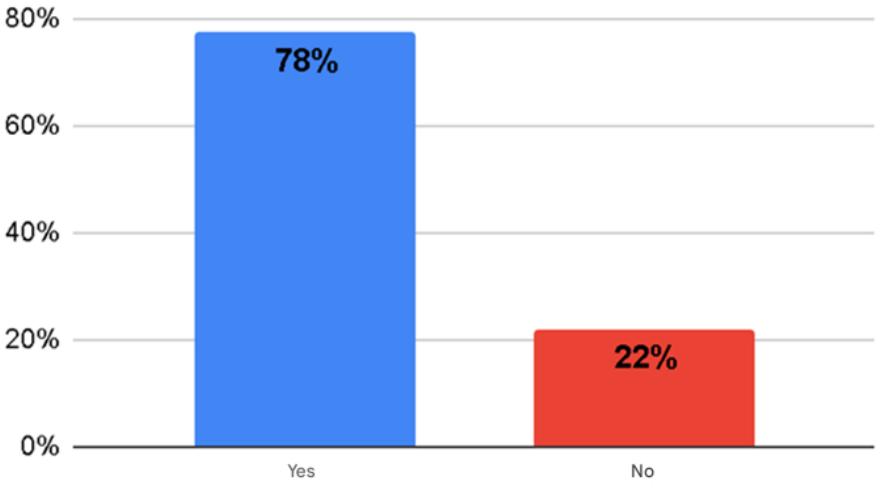
Source: Authors, (2021).

When asked if they would like to change something where they live, 78% answered yes (Figure 15). During the application of the questionnaires, part of the residents reported that they would like to see significant changes, such as the creation of a well-structured waterfront, the creation of an artificial beach, improvement in local safety, more frequent cleaning and more care for nature by the residents. These results indicate that most of the respondents observe and identify the various demands that exist in the district of Vista Alegre. The desire to create an artificial waterfront or beach expressed by some respondents indicates the desire for Vista Alegre to become more urbanized, as the current configuration

is little urbanized and the district has few leisure and social spots, motivating part of the residents to want more interesting and attractive areas for tourists.

Figure 15

Question: "Is there anything you would like to change where you live?"



Source: Authors, (2021).

3.3 ENVIRONMENTAL EDUCATION ACTION

The environmental education action was attended by 20 participants, within this group are members of the local community and representatives of the public power. The mangrove cleaning task force provided all participants with active contact with the environmental problem of solid waste in the Mestre Lucindo REM (Figure 16), favoring the awakening to the concern with the preservation of the mangroves that surround the city. Stern, Powell, and Hill (2014) define active participation as participants who are actively involved in the educational experience not only as passive verbal receptors, but also as active receptors.

Figure 16

Cleaning effort

Source: Authors, (2021).

The approximation of the community with the local environmental problems is fundamental, because through the task force the participants acquire the perception that they are part of the problem and that they need to change some behaviors to minimize such obstacles, as shown in the answers in Table 1.

Athman and Monroe (2001) point out that the content within environmental education actions is transmitted more effectively when incorporated into a local context, which facilitates sensitivity and knowledge about local problems, contributing to a greater connection with the environment in which they live, therefore, environmental education actions that bring participants closer to the local context, help the community to prevent and minimize environmental problems through a sense of personal and civic responsibility.

Table 1

Question to the local community "What did you learn from this environmental education action?"

Participant	Age	Answer
1	40 years	*That we must take care of the mangrove and not throw garbage, because then we will be preserving it for our children and grandchildren.*
2	13 years	*I learned that we must preserve the environment.*
3	22 years old	*I learned that we must take more care of nature and take more care of my locality.*
4	19 years old	*We learned to preserve the environment and that it is very important for our culture.*
5	43 years old	*I learned that we must make people aware of preserving nature, especially the mangroves*
6	45 years	*I learned that we should not throw garbage in the sea, bottles and plastic bags, we should preserve nature*

Source: Authors, (2021).

Silva, Flores and Zanin (2011) argue that environmental education should be a permanent process in which individuals and the community become aware of their environment and acquire knowledge, values, skills, experiences and determination that make them able to act and solve present and future environmental problems. In this context, from the observation of the answers of the participants interviewed after the action (Table 1), it is

possible to observe that the word "preserve" is present in all the answers, and preserving for these people has the meaning of caring, caring for and protecting the environment in which they live. This result shows that the cleaning task force generated positive impacts, revealing the effectiveness of the environmental education action, contributing to the improvement of the environmental perception of the participants of the action.

The participation of representatives of the public authorities in the environmental education action was extremely positive, as it made it possible to bring the community and its representatives in the public administration closer together. The task force brought the representatives of power closer to the reality of the problem of solid waste in REM Mestre Lucindo, showing the need to carry out more environmental education actions.

When asked about the importance of carrying out environmental education actions, as shown in chart 2, the representatives of the public authorities reported their concern with the problem of solid waste in the Mestre Lucindo REM and emphasized the importance of carrying out environmental education actions in the localities that make up the district of Marapanim, as the issue of solid waste is not only a reality in the community of Vista Alegre. They also reported the difficulty of carrying out actions like this in the region, due to the lack of structure in the local environmental department and lack of technicians to meet the needs of the entire municipality.

Table 2

Question to the representatives of the public authorities "What was the importance of carrying out this environmental education action?"

Name	Answer
Representative of the Secretariat of Fisheries	*The environmental education action carried out directly helped in new views on garbage disposal, leading the community itself to reflect. As for the public power, such action was of paramount importance from the moment it directly involves us as the secretariat to experience the practice, brings reflections and concerns with the environmental problems seen there, thus arising a need to educate ourselves, so that we can guide other communities that go through the same situation.*
Representative of SEMMA-Marapanim	*For us at SEMMA it was a great satisfaction to work with the students, because as our human resources are limited, this ends up limiting the development of more educational actions such as the one promoted in Vista Alegre. In my perception, the cleaning effort, despite being a one-off initiative, serves as a warning for residents to see the place where they live with more attention and zeal, because by throwing solid waste on the riverbank, this starts to turn against them, as it harms the reproduction of fishing resources, contributes to the proliferation of vectors, in*

	addition to causing visual pollution. So, it is hoped that, with more actions like this, residents can awaken to a sharper awareness of environmental problems, especially in the place where they live.
Representative of SEMMA-Marapanim	*The environmental education action was very important for the environment and especially for the interior of Vista Alegre. There could be more actions like these, because our mangroves have a lot of garbage, a small action like this would be very important for the environment.*

Source: Authors, (2021).

3.4 ENVIRONMENTAL EDUCATION AS AN INSTRUMENT FOR THE PROBLEM OF SOLID WASTE

The relationship of the population with the environment in which they live is not only related to environmental perception, as factors such as access to education, politics, economy, culture, among others, influence the way the population relates to the environment. Environmental education emerges as a tool for transformation, in the sense of improving people's environmental perception, and thus ensuring a balanced environment for all.

Environmental education involves several aspects, going beyond the efforts to improve the environmental perception of the group involved. Silva and Pessoa (2013) argue that environmental education is no longer being conceived with an emphasis on only one of its aspects, which is the ecological, also taking into account the economic, social, ethical, political, scientific, technological and cultural aspects.

According to Eckert et al. (2017), environmental perception, associated with environmental education, allows the researcher to know the public involved, based on the reality of the group. This focus is important for strengthening local actions, capable of adding benefits to the environment and providing a sustainable relationship between communities and the environment, directly contributing to participatory socio-environmental management and local development.

In this way, environmental education is a key instrument to minimize environmental problems, however, dealing only with the ecological aspect is not enough to achieve significant transformations within scenarios such as REM Mestre Lucindo, because the situation within it is beyond the environmental perception of the local community, because it involves structural problems, such as: the lack of daily collection of solid waste, lack of sanitary landfills, the lack of technical staff in the municipal secretariats to carry out environmental education actions. This scenario does not only represent the municipality of Marapanim, but a large part of the communities of Pará.

4 CONCLUSION

This study aimed to carry out an Environmental Education action as a result of the problem of solid waste in the RESEX Marinha Mestre Lucindo, in the district of Vista Alegre in the municipality of Marapanim, in order to raise awareness among the population for the correct management of waste in the mangrove area that surrounds the coast of the district.

The results obtained from the application of the questionnaires reveal that the population of the district of Vista Alegre has environmental perception and understands that it is necessary to care for and preserve the mangrove swamp that surrounds the locality where they live, however, the problem of solid waste in the current scenario of REM Mestre Lucindo is complex, as it involves several factors in addition to the environmental perception of local residents.

The environmental education action carried out in the form of a cleaning task force served as a tool to bring the local community and representatives of the public power closer to the problem of solid waste in the RESEX, this environmental education action allowed the participants to understand and further develop the need and desire to care for and preserve nature.

The realization of the cleaning task force together with representatives of the public power, allowed the employees of SEMMA of Marapanim, to identify the need to carry out more environmental education actions throughout the municipality of Marapanim, they reported that the difficulty of carrying out environmental education actions is related to the insufficient number of technicians in the SEMMA of the municipality, And due to this factor, they are unable to meet all the demands that exist in the place. The approach made possible by this environmental education action was positive for all involved, where everyone understood that they are part of the solution to the problem of solid waste in REM Mestre Lucindo.

Therefore, it is concluded that from the results obtained through this study, it is possible to observe that environmental education is a fundamental instrument to combat the problem of solid waste in the REM Mestre Lucindo, however, there are other tasks to be carried out in the district of Vista Alegre to achieve a significant reduction in waste that is dumped and deposited in the mangrove, it is necessary to improve the collection of solid waste, distribute more garbage cans throughout the district, it is essential that there is an increase in the technical staff of SEMMA in Marapanim so that more actions like this can be carried out more frequently and thus minimize the problem of solid waste in REM Mestre Lucindo.

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