The natural ecomuseum of mangrove: educational and reforestation actions

O ecomuseu natural do mangue: ações educativas e de reflorestamento

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ABSTRACT
Green areas in the context of cities are essential element for the well-being of the population, because it has the purpose of improving the quality of life and environmental preservation, in this sense. This research aimed to identify and analyze the educational and reforestation actions carried out by the EcoMuseu Natural do Mangue, located in the Sabiaguaba neighborhood (Fortaleza-CE), through environmental education activities and the reforestation of the area in its surroundings. The proposal is to get visitors to know initially the museum's collection, where they will have a lecture on the ecosystem and its preservation, after they will be led by monitors on an ecological trail through the mangrove where they will have the opportunity to experience one of their richest experiences of environmental education. An education for a new look at the mangrove and awareness that the construction of "a new world is possible", paraphrasing Paulo Freire. The methodology applied in this article was bibliographic, through the reading of authors who conceptually and theoretically address the issues related to the proposed theme. Among the results obtained, in 2015, there was an increase of about 10% of mangrove reforestation in the entire area of the park. Since reforestation and environmental education are among the most effective alternatives for the recovery of a degraded area.

Keywords: EcoMuseu Natural do Mangue, Educational actions, Reforestation, Environmental education

RESUMO
As áreas verdes no contexto das cidades entram como elemento essencial para bem-estar da população, pois tem a finalidade de melhorar a qualidade de vida e a preservação ambiental, neste sentido. Esta pesquisa teve por objetivo identificar e analisar as ações educativas e de reflorestamento realizadas pelo EcoMuseu Natural do Mangue, localizado no bairro Sabiaguaba (Fortaleza-CE), através das atividades de educação ambiental e do reflorestamento da área no seu entorno. A proposta é levar os visitantes a conhecer inicialmente o acervo do museu, onde terão uma palestra sobre o ecossistema e sua preservação, após serão conduzidos por monitores em uma trilha ecológica pelo mangue onde terão a oportunidade de vivenciar uma de suas mais ricas experiências de educação ambiental. Uma educação para um novo olhar para o mangue e conscientização de que a construção de “um novo mundo é possível”, parafraseando Paulo Freire. A metodologia aplicada nesse artigo foi bibliográfica, através da leitura de autores que abordam conceitualmente e teoricamente os assuntos relacionados à temática proposta. Entre os resultados obtidos, constatou-se em 2015 o aumento de cerca de 10% de reflorestamento de mangue em toda área do parque. Visto que o reflorestamento e a educação ambiental estão entre as alternativas mais eficazes para a recuperação de uma área degradada.

Palavras-chave: EcoMuseu Natural do Mangue, Ações educativas, Reflorestamento. Educação ambiental

1 INTRODUCTION

The mangrove is "Coastal ecosystem of transition between terrestrial and marine environments, characteristic of tropical and subtropical regions, subject to tidal regime" (SCHAEFFER-NOVELL, 1995).

They are known as the "nursery" of life at sea, because they play an important role as an exporter of organic matter to the estuaries, contributing to primary productivity in the coastal zone. For this reason, they are complex ecosystems and the most fertile and diverse on the planet. Mangroves are transitional environments formed by the encounter of river waters with those of the ocean, occurring in sheltered coastal regions.

Given the scenario of inadequate exploitation of mangrove areas, mainly caused by deforestation, burning and real estate speculation, it is necessary to adopt reforestation measures and sensitize the education of human beings the need for recomposition and preservation of the environment.

Thus, the EcoMuseu Natural do Mangue, located on the east coast, sabiaguaba neighborhood, city of Fortaleza – state of Ceará, still rural neighborhood, with few inhabited areas (where about 30 families live), surrounded by three lagoons, a river, mangroves, large sheet of dunes and the sea. This EcoMuseum was designed to, through the realization of ecological trail through the mangrove associated with the visit to its archaeological collection, educate the eyes of visitors (students and tourists) and the whole community to social and environmental issues and the importance of protecting and conserving the mangrove ecosystem, thus contributing to the sustainable development of the community that guarantees the quality of life today , but does not destroy the resources needed by future generations. Among its main activities, reforestation and field classes.

The dynamic developed by EcoMuseu is to take visitors on site to know and interact, visiting the collection, getting caught in the roots during the expedition through the mangrove areas and actively participating in reforestation. Each person who passes through the EcoMuseum leaves its mark, that is, its planted tree.

The methodology applied in this article was bibliographic, aiming to elucidate and support the work carried out by the NGO, through the reading of authors who conceptually and theoretically address the issues related to the proposed theme, and showing the most recent results of the environmental education process culminating in good growth of the mangrove area.

This article aimed to identify and analyze the educational and reforestation actions carried out by the EcoMuseu Natural do Mangue, located in the Sabiaguaba neighborhood (Fortaleza-CE), through environmental education activities and the reforestation of the area in its surroundings. The research will be distributed during the text in the form of concepts about the main themes relevant to the context, we will situate the reader as to the place where the actions occur, and how they are developed and we will show some of the results obtained and expected with the accomplishment of this work, such as the growth of the reforestation area.

2 MANGROVE AS AN ECOSYSTEM AND ITS IMPORTANCE

"From roots stuck in the ocean, the mangrove sustains rich marine life and thrives where other trees cannot survive" (National Geographic – 01.02.07).

Mangroves live on the edge, with one foot on the ground and the other at sea, these botanical amphibians occupy a zone of destitating heat, mud and salt contents that would kill a common plant in a few hours. However, mangroves are complex ecosystems and the most fertile and diverse on earth. (superambiente.blogspot.com.br - 2007).

Each mangrove has an ultrafiltration system that prevents the absorption of much of the salt and a complex root system that allows it to survive in the zone between tides. Some have roots called pneumatóphores, hollow as a snorkel, which protrude over the sloth and allow the plant to breathe. Others use adventitious roots as anchor to keep their trunk upright even in the soft sediments of the tidal edge.

For Schaeffer-Novelli (1999) mangroves stand out as a source of particulate and dissolved organic matter for adjacent coastal waters constituting the basis of the trophic chain with species of economic and/or ecological importance; shelter area, reproduction, development and feeding of marine, estuarine, limbic and terrestrial species, in addition to landing migratory birds; coastline protection against erosion, silting of adjacent water bodies, flood prevention and storm protection; maintaining the biodiversity of the coastal region; absorption and immobilization of chemicals, filter of pollutants and sediments, as well as treatment of effluents at their different levels; source of recreation and leisure associated with its landscape appeal and high scenic value and source of protein and various products, associated with the subsistence of traditional communities living in areas surrounding the mangroves.

Many human communities rely on mangroves for survival and use a range of natural resources from the ecosystem and its surrounding waters. Historically, the

anthropic pressure on mangroves has been very strong, even considering that in the conception of some people such places are inhospitable, unhealthy and dangerous, were not easily accessible and few ventured into them, until the arrival of real estate and housing industries.

Lately, due to population pressures, food production, industrial and urban development, there has been greater destruction of mangroves worldwide. As the search for land and natural resources grows, we observe the mangrove areas gradually being occupied even by projects of the State (agent responsible for its preservation), aiming at urban expansion and the settlement of populations. The degradation processes are strong because it is in the coastal zone of the continents that human occupation occurs with greater intensity, consequently subjecting not only mangroves but also to other coastal ecosystems to pressures (cities, industrial centers, ports, landfills, tourist complexes, etc.) that often completely destroy the balance of extensive areas.

Worldwide there are only 28 genera and about 70 mangrove species, 17 of which are exclusively present in this habitat. This reflects a low genetic diversity due to the difficult conditions encountered in environments suffering from tidal fluctuations, where there appear to be fewer opportunities for diversification and selection of genetic material. However, the worldwide dominance of the genus Rhizophora L. (DUKE et al., 1998) is impressive.

Most mangroves are 30 degrees from the equator, but some tough types adapt to temperate climates such as New Zealand mangroves, far from the tropical sun. But wherever mangroves live, one thing has in common: talent to adapt - plant formation of Brazilian Mangroves, with regard to tree plants, consists basically of three genera (Rhizophora, Avicennia and Laguncularia) and six species (R. mangle, R. racemosa, R. harisonii, A. schaueriana, A. germinans and L. racemosa), with three of them presenting wide distribution: the Red Mangrove (R. mangle), the White Mangrove (L. racemosa) and the Mangue siriúba (A. schaueriana). Non-typical elements such as Conocarpus erecta, Hibiscus tiliaceus and fern Acrosticum aureum (characteristic of transition areas for the terrestrial environment) also appear in the Mangrove. Mangrove is rich in species of algae and lichens, according to Schaeffer-Novelli (1989).

The estuaries of the Brazilian coast are prodigal, because mangroves are well represented along the Brazilian coast, and are considered, as permanent preservation, included in various constitutional provisions (Federal Constitution and State Constitutions) and infraconstitutional (laws, decrees, resolutions, conventions). The

observation of these legal instruments imposes a series of orderingof the use and/or actions in mangrove areas (SCHAEFFER-NOVELLI,1994). "Everyone has the right to the ecologically balanced environment, well of common use of the people and essential to the healthy quality of life, imposing on the Public Power and the collectivity the duty to defend it and preserve it for the present and future generations." § 1 - To ensure the effectiveness of this right, it is incumbent upon the Public Authorities: "I - preserve and restore essential ecological processes and provide ecological management of species and ecosystems; (Regulation)" Federal Constitution of 1988, Article 225.

We also have the New Forest Code dated 2012, where the definition of the ecosystem and its framework as an area of permanent preservation are therefore expressed legislative seat, contained in item XIII of Article 3 and in item VII of Article 4, all of the new Forest Code: Art. 3o For the purposes of this Law, it is understood as: XIII - mangrove: coastal ecosystem that occurs on low land , subject to the action of the tides, formed by recent or sandy slime vasas, which is predominantly associated with the natural vegetation known as mangrove, with fluviomarine influence, typical of limous soils of regions and stuarinas and with discontinuous dispersion along the Brazilian coast, between the States of Amapá and Santa Catarina;

Despite their importance, mangroves worldwide are sacrificed in favor of salt pans, coal farming tanks, real estate developments, roads, ports, hotels, golf courses, plantations and die for a number of indirect causes: oil spill, chemical pollution, water pollution, excess sediment, disruption of their delicate water and salt balance, and also real estate speculation (which lands its areas for house building marinas and industries). "The cries for conservation soon got more important attention in the wake of tsunami2 2004, in the ocean indicated. In places where the mangroves were intact, they acted as a natural breakwater, dissipated the energy of the waves, minimized property damage, and may have saved lives. After the tsunami, the logic of allowing these bioshields to be destroyed seemed not only flawed, but objectionable."

There is currently also a great concern with the quality of water, because, as is generally known, tides, rivers and lakes are in the process of degradation (especially by the amount of garbage left on its banks), with high rates of substances harmful to human health and ecological balance.

Green areas in the context of cities are essential element for the well-being of the population, because it has the purpose of improving the quality of life, landscaping and environmental preservation, thus being important for the quality of urban life, they act

simultaneously on the physical and mental side of man, absorbing noise, attenuating the heat of the sun, improving air quality, contributing to the formation and aesthetic improvement (SILVA, 2009).

Mangrove management depends directly on the characteristics peculiar to each of them, and must comply with the ecological planning of this ecosystem, among the activities and uses recommended for this region stand out: subsistence fishing defined as: artisanal fishing practiced by riverside and/or traditional populations, to ensure family food, without commercial purposes. For subsistence fishing the quota is three kilos or a copy of any weight for subsistence purposes, respecting the minimum catch sizes established by the legislation, for each species.

The development of tourist and recreational activities, have as main objectives: to facilitate access to water resources for the population; enable rational use in leisure activities; be an ecological awareness area and promote tourism in the region.

Environmental education is a process by which each and the collectivity build social values, knowledge, attitudes and competencies aimed at the conservation of the environment, as well as the common use of the people, essential to the healthy quality of life and its sustainability.

3 NATURAL ECOMUSEUM OF THE MANGUE DA SABIAGUABA AND ITS ENVIRONMENTAL EDUCATION ACTIONS

Located within the APA of Sabiaguaba which is composed of: Conservation Units (UC's), PARQUE and APA, which were officially created through decrees no. 11,986 and no. 11,987, respectively, in February 2006. The PNMDS is a conservation unit of the integral protection group and the Environmental Protection Area of Sabiaguaba belongs to the group of conservation units for sustainable use, serving as a damping zone for the municipal park. The creation of the units aims to preserve existing natural ecosystems, enabling scientific research and the development of environmental education, ecotourism and community tourism activities compatible with the SNUC Law.

The creation of these two protection units were the result of the need to monitor the use and development of the coastal zone in a conscious way enabling the strategic freshwater reserve for the city, for the lagoons and for the mangrove ecosystems.

However, despite the creation of the Park and being included among the 12% of the protected lands, the environmental protection area has been suffering a political abandonment and is completely unprotected by the lack of actions that educate for its

conservation in order to contemplate the love of nature, combined with rational use and its judicious management, so that the community can perform a role of manager and feel an integral part of the process.

Sabiaguaba beach is an area that also suffers from the exclusion of public policies and most of its population is concentrated in a riverside slum that presents several problems such as drug traffic, discrimination and social violence, malnutrition among children and social exclusion of young people.

The Natural Ecomuseum of Mangue, in the people of its founder Rusty de Castro Sá Barreto and its other members, understand that environmental education in being a process through which the individual and the collectivity build social values, knowledge, skills, attitudes and competencies aimed at the conservation of the environment, as well as common use of the people, essential to healthy quality of life and its sustainability , is one of the strong tools to be used in the best community and social development.

This concept is contained in law 9,795 of 1999, which defines the National Environmental Education Policy. According to which, environmental education is an essential and permanent component of national education, and must be present, in an articulated way, at all levels and modalities of the educational process, on a formal and non-formal basis.

Over the years, we have clearly seen the scenario of devastation of the ecosystems of the planet earth, especially with regard to anthropic actions, the realization of reforestation practices, environmental awareness or education and the conservation of ecosystems in particular in this study, mangrove by initiatives of private entities (NGOs) and such initiatives make a big difference in this context, since public policies do not fulfill this which is one of their roles.

Unfortunately, it was necessary to see to believe that man is self-destructing, using nature in a disoriented and inconsequential manner. Today the attitudes of some began to change with practices aimed at reforestation, awareness and environmental preservation.

In this new vision is the institutional mission of the EcoMuseu Natural do Mangue da Sabiaguaba whose actions have as their design the defense, elevation and maintenance of the quality of life of the human being and the environment, through the activities of environmental education, as well as the reforestation of mangrove areas.

The mangrove is "coastal ecosystem of transition between terrestrial and marine environments, characteristic of tropical and subtropical regions, subject to tidal regime" (SCHAEFFER-NOVELL, 1995).

Being the fauna and flora of the mangroves, rich and abundant, a fact that makes them estuarine ecosystems with a high biological productivity, as observed in the trails of the Poo River Park in the state of Ceará (where Sabiaguaba is located).

Much of the estuary of the Cocó River, within the Poo Park in Fortaleza was grounded indiscriminately for the construction of shopping Iguatemi, causing this river to lose much of its productivity in biological species, such as molluscs, fish, crustaceans, which are exploited by the riverside population.

The grounding of the mangrove to expand civil construction has meant a very high damage to society, because the areas will always have high water table, compromising electrical installations and sewage drainage does not process properly and, when it occurs, pollutes the mangrove.

Another fact was the construction of the bridge that connects Praia do Futuro to Sabiaguaba beach, the target of a series of criticisms by environmentalists. First because it occurs in an area of environmental preservation — which comprises the final stretch of Praia do Futuro, the entire estuary of the Cocó River and even dune fields, apicuns (transitional vegetation between the land and mangroves), restingas, gamboas (tide channels of the estuary), mangroves and transition forests, where environmental impacts have been clearly increasing. With so much "progress", the mangrove, the river and the sea are seriously threatened, that's what environmentalists fear. In this regard, the geologist and professor of the Department of Geography of the Federal University of Ceará (UFC), Jeovah Meireles, explains that the bridge will block the entry of sediments into the mangrove, by interfering in the free passage of water, the pilasters promote the silting of the river banks. According to him, the implantation of structures in the bed will also cause changes in the habitats of the animals that live there. The sandbanks moving towards Praia do Futuro will be reduced, causing, in the medium and long term, the erosion of the coast. "The sea will invade the built area," Meireles says.

And at this point that the issues of environmental education come strongly, which according to the final document of the Tbilisi Conference (1977) is: the result of a reorientation and articulation of the various disciplines and educational experiences that facilitate the integrated perception of the environment making possible a more rational and capable action and respond to social needs (IBAMA, 1977, p. 106).

Another global initiative was the holding in Stockholm (1972) of the United Nations Conference on the Human Environment and, where for the first time, in

intergovernmental instance, the environmental issue was discussed from a political, economic and social perspective.

From these discussions, the United Nations Environment Programme (UNEP) and the concept of eco-development were created, which is opposed to the current development models adopted, from the Brundtland Report, the concept of eco-development has been replaced by the expression "sustainable development".

Unfortunately, the term sustainable development has been appropriated by some private and public sectors as a form of advertising of their products and services. Emptied of its real ideological sense, which is the rupture of a model that privatizes profits for a minority and socializes the losses to a majority, the term sustainable development becomes a dead letter. In this sense, an environmental education that is really capable of embodying the societal, ethical and aesthetic dilemmas of the current civilization can greatly contribute to the realization of a development that is really sustainable (CARVALHO, 2006).

Within this context, it is clear the need to make possible educational practices that lead to the formation of a socio-environmental awareness and behaviors within educational institutions.

A proposal for environmental education, to be effectively emancipatory and promoter of new sensitivities and worldviews, should provide, concomitantly, the development of knowledge, attitudes and skills that favor a more respectful relationship between the Human Being and Nature. It is also necessary to take into account that environmental education is not a neutral activity. In fact, it is one of the political issues that involve values, interests and worldviews that are quite divergent, and that can assume more conservative or emancipatory currents. This means that there is no "one" environmental education, but multiple pedagogies of environmental education, as are the current conceptions of the world and society (SCHAEFFER-NOVELL,Y(1995,p.7)).

It is within the context of environmental education that the proposals of the EcoMuseu natural do Mangue da Sabiaguaba are made, covering educational actions of field class with the schools and universities of the city of Fortaleza and other municipalities in the state of Ceará, which has culminated in the addition of awareness, in the reforestation of mangrove areas in the adjacent region.

"In a small brick structure on the mangrove is the portal to discuss the preservation, nature and community, different from the collective demands of community museums, indigenous or periphery the neighborhood of Sabiaguaba houses for six years

a unique experience: the Eco Museum of the Mangrove of Sabiaguaba, located at the mouth of the bar of the River Cocó, near the beach of Caça e Pesca , The collection focuses on the memory of the local community to rescue and affirm the history of its relationship with the ecosystem. The mangrove keeps the marks of its relationship with residents and external interventions. The residents, the traces of their biodiversity, the uses of the mangrove and its capacity for regeneration."

The concept of the Ecomuseum is based on the so-called New Museology, in which the greatest interest is for the development of populations, reflecting the motor principles of its evolution and associating them with future projects. It is a movement – also called active museology – that affirms the social function and the overall character of the museum and its interventions. According to Mr. Rusty de Castro Sá Barreto (founding president of the project), "In an Ecomuseum, the mission is not limited to documenting the mangrove and its natural history, but also collecting material and immaterial goods that report the lives of the riverside communities that inhabit the mangrove and spread the importance of conservation of both."

In the space allocated there is also a captivating collection duly organized and composed of curious and important pieces, such as arcades of sharks, bones of whales and turtles, molluscs, corals and fish, as well as specimens preserved in formaldehyde, such as seahorse, lacraia and more fish.

Not only do the elements impact the children's imagination, but they refer to the mangrove environment and the surrounding sabiaguaba beach. There, for example, headturtles are often found – threatened with extinction – often killed or dying because of man. Birds, parts of the mangrove universe, are also represented in the museum, as are crabs and crabs, symbols of the mangrove.

According to other reports of Mr. Rusty, since 2001 the year the project was born, more than 30,000 people have passed through the Mangue Natural Museum – many of them students from public and private schools.

Everyone who gets there lives a little mangrove. "The visit itself to the museum is only half the tour," rusty says. "Because it is a museum with experimental experience, different every season of the year."

During the field classes (trails) environmental education takes place, where participants come up with different species of fauna and flora, according to the following schedule:

At the beginning of the view to the collection the students and/ or visitors attend a lecture on the mangrove, and then follow and guided by monitors the guided and explained tour to the protected area of mangrove, going through the following excerpt::

1. Station - Museum (collection)
2. Station - live laboratory
3. Station - red mangrove
4. Station - white mangrove
5. Station - black feet track
6. Station - dune trail
7. Station - solidarity trail
8. Station - reforestation with mangrove seed
9. Station - reflection on the Sabiaguaba bridge
10. Station - sea track
11. Station - waterfront track
12. Station - mouth bar track

4 NATURAL ECOMUSEUM OF THE MANGUE OF SABIAGUABA AND REFORESTATION

Being reforestation understood as an activity dedicated to recomcant the forest cover of a given area. Reforestation can be carried out with the objectives of recovering the original ecosystem, through the planting of native or exotic species, obeying the ecological characteristics of the area (ecological reforestation), or with commercial objectives, through the introduction of species of rapid growth and adequate quality, for slaughter and subsequent commercialization (LEMOS; GOMES, 2008).

"Act of reforestation, of planting trees to form vegetation in felled, for soil conservation and climate attenuation" (GOODLAND, 1975).

Since it is an ecosystem of the most important and discriminated, because they participate in the contribution to the sequestration of atmospheric carbon and reforestation initiatives must have considered their values added to the socioeconomic activities developed by the human communities that inhabit the areas of the projects. The parameters should refer to both biophysical variables (volume of carbon sequestered in the formed biomass, use of appropriate species, plant and animal biodiversity, survival and growth rates of planted specimens, salinity, soils, etc.) and socioeconomic variables (environmental services, paid and voluntary work, restoration of productive activities,

alternative uses of affected lands, average living standards of inhabitants, etc.). The overall objective of these projects should include the use of socioeconomic, ecological and educational parameters.

In Brazil, the Forest Code created from Decree No. 4,771 of September 15, 1965, determines the legislation responsible for forestry and reforestation in Brazilian territory, also determining punitive measures for non-compliance with current laws.

The area built with the ecomuseum's office in permanent preservation area is 87.6 m². Starting from an analysis of the area around the EcoMuseum, from 2007 on, an area of 1.42 hectares with remnants of native vegetation was identified1. It is noteworthy that 4.6% of this area is already the result of the reforestation carried out by EcoMuseu since 2001.

Today there was a reforested area of approximately 0.14 hectares and was reforested by projects developed by EcoMuseu. This represents an increase of approximately 9% of the total existing area, in the analyzed stretch, with native vegetation. There was also an increase of 1.33 hectares of natural recovery3 of the mangrove in areas that were burned in the bed of the Cocó River. 20% of this area is in the initial stage of recovery and 80% in the most advanced stage of recovery. This represents an increase of approximately 94% of the vegetated area in the cocó river bed in the analyzed stretch.

It is concluded that the actions of the EcoMuseu provided the recomposition of 1.46 hectares of mangrove at different levels. This represents an increase of more than 100% over the initial area. The analysis made through remote sensing shows that much of this recovery has occurred in the last six years.

Figure 1 shows the thematic map and in the summary table of georeferenced areas.

Figure 1. Summary of Environmental Technical Survey, Fortaleza, 2015. Georeferencing done in the field

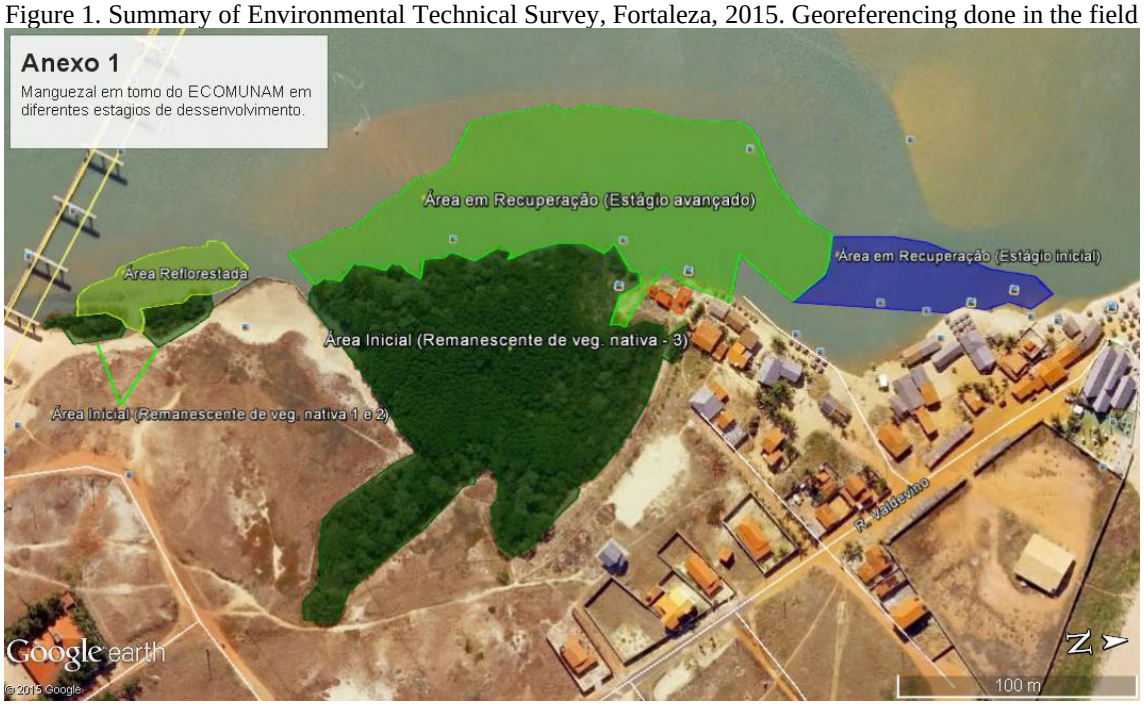

Table 1. Summary of the areas mapped around the Ecomunam, in the poo river

Areas	**Total área m²**	**Total area ha**	**Perimeter/m**
Initial Area (Remnant of native vegetation 1)	270	0.027	78.4
Initial Area (Remnant of native vegetation 2)	388	0.0388	83.8
Initial Area (Remnant of native vegetation 3)	13,546	1.3546	706
Reforested area	1,349	0.1349	181
Area in recovery (initial stage)	2,247	0.2247	246
Natural recovery (advanced stage)	11,013	1.1013	650
Total	**28813**	**2.8813**	**1945.2**

5 FINAL CONSIDERATIONS

The purpose of this article was to awaken awareness and reflection to readers about the importance of the Mangrove Ecosystem, to show the development process of the Museum's field classes and especially the growth of the reforested Mangrove area.

It is necessary to remember that it is the responsibility of the whole society to establish a structure capable of asserting the rights of the mangrove, as well as the rights of each of us as human beings, through the implementation of policies aimed at the rational and sustained use of their riches and the maintenance of surveillance and protection, as well as the awareness of each one of us.

I hope to be contributing to the awakening of everyone's attention to mangrove, so that its strategic, ecological and economic importance can be understood, disseminated, respected and protected from destruction.

And that we can create in the current and future generations the awareness and awareness that we need to treat with care and responsibility nature and all ecosystems, because this way we will be dealing with the permanence of countless species of flora and fauna, as well as our own preservation.

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