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## Can the *Ucides cordatus* Fishing and the *Crassostrea gasar* Creation on the Amazon Coast Make up the Curriculum of Rural Schools

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ABSTRACT

The fishing and ostreiculture activities practiced in the coast of the Eastern Amazon in the state of Pará, Brazil, became important to be inserted in rural education. Thus, this literature review aimed to realize a brief theoretical discussion about the important aspects of rural education in promoting the development of fishing and osteiculture. For the accomplishment of the literary research it was sought to explain the definition in education; rural education and valorization of the rural environment; environmental education as a transversal theme; fishing and aquaculture as a teaching strategy; considerations of fishing and osteiculture; challenges and perspectives of the teaching of fishing and aquaculture in education; and booklet as a pedagogical tool in education. In conclusion, the use of fishing and osteiculture as a strategy for rural schools through environmental education is important to foster fishing activity in communities, as well as the sustainable use of natural resources.

### 1. Introduction

Crab fishing (*Ucides cordatus* Linnaeus, 1763) is one of the oldest and most important activities of state of Pará, Amazon, Brazil<sup>[1,2,3]</sup>. There are several rural communities in the Amazon region depend on the extraction, proces-

sing, transport or commercialization of this crustacean to ensure income and livelihood<sup>[4]</sup>.

Ostreiculture (*Crassostrea gasar* Adanson, 1757), in turn, is an aquaculture activity that has been growing mainly in communities closest to mangrove áreas<sup>[5,6]</sup>. This activity, beyond to generating income for communities,

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contributes to the conservation of estuaries, reducing the pressure on natural stocks and promoting a sustainable exploitation of the environment <sup>[7]</sup>.

Although this local importance, mangroves have been subjected to strong anthropic stresses at increasing levels, caused by the fast and intense degradation process coming from urban occupation, industry and poor land use planning <sup>[8]</sup>. In addition, the overexploitation of fishing resources, the contamination and pollution of the environment (by chemical substances and urban solid waste) are the main aggressions caused by man <sup>[9]</sup>.

The educational process is configured as an important ally against social determinism <sup>[10]</sup>. Thus, Environmental Education (EE) emerges as a teaching-learning strategy. This education presents the objective of consolidating in students a social, participatory and permanent pedagogical process. In that way, they acquire responsibilities in the environment in which they live <sup>[11,12]</sup>.

It is worth to mention that experiences in fishing and aquaculture at school have been reported in several studies <sup>[13,14,15]</sup>. These highlight the purpose of strengthening contextualized learning. Corroborating with the principles of EE, the Rural Education (ER) starts from social, political and cultural interests, taking into account the singularities of their existence, as well as their life contexts <sup>[16]</sup>. Both, through Gadotti <sup>[17]</sup>, Freire <sup>[10]</sup> and Brandão <sup>[18]</sup>, defend an education in which subject is respected and heard, where the curricula and contents work the concrete reality experienced by rural people, becoming active agents in their teaching and learning process.

Thus, the purpose of this literature review was to present the importance of rural education in promoting the development of fishing and aquaculture.

## 2. Definition in Education

Education is the process of integrating the human for self-knowledge and to transmission of moral, cultural and civic values that sustain the society <sup>[19]</sup>. For Brandão <sup>[20]</sup> education is a fraction of the way of life of social groups that create and recreate their own culture. Thus, it is a social practice necessary for the development of own life <sup>[10]</sup>.

In Brazil, education is a right for all guaranteed by the Brazilian Federal Constitution of 1988 <sup>[21]</sup> and regulated by the Law of Directives and Bases of National Education (LDB). Education is the entire responsibility of governments at the federal, state and municipal levels, as well as managing and organizing the respective educational systems <sup>[22]</sup>.

However, according to Marques and Oliveira <sup>[19]</sup> there is not unique way to do education. According to the same authors, the school is not the only place where it happens

and neither the teacher is its only practitioner. Education is present in every people and everywhere in the world, from small tribal societies to large developed and industrialized cities; from small rural farmers to large landowners employers <sup>[18]</sup>.

In this sense, the education is divided into modalities to better to serve the different people with their specificities <sup>[23]</sup>. Among which we highlight the Rural Education which aims to promote the educational process to consolidate values, principles and ways of being and living of those who integrate the field <sup>[24]</sup>.

## 3. Field Education and Appreciation of the Rural Environment

Rural Education (ER) is constituted as a strategy to transform the Brazilian rural space. Such education rescues not only production, but the territory of sociocultural relations with nature <sup>[16]</sup>. According Caldart et al. <sup>[24]</sup>, the ER emerged with greater prominence in the Brazilian scenario, from the 1990, in the combination of the struggles of the Landless for the implantation of public schools in the areas of Agrarian Reform with the resistance struggles of numerous organizations and peasant communities not to lose their schools, their experiences of education, their communities, their territory and their identity.

Since then, the ER has been accumulating a set of legal instruments that recognize and legitimize the necessary conditions for the right to education, respecting the specificities of rural subjects and appreciating the rural environment <sup>[23]</sup> (Table 1).

**Table 1.** The rural education in Brazilian legislation.

Legislation	Proposal
<b>Opinion CNE/CEB n°. 36/2001.</b> It provides for the Operational Guidelines for Basic Education in Rural Schools, provides for Rural Education Policy.	It proposes to adapt the institutional project of rural schools for the National Curricular Guidelines in all teaching modalities.
<b>Opinion CNE/CEB n°. 02/2008.</b> It provides guideline for the attendance of rural people and refinement of Rural Education concept.	It guarantees the expansion of care closer to the realities of rural communities.
<b>Decree n°. 7.352/2010.</b> It provides for the Rural Education Policy and the National Program for Education in Agrarian Reform – PRONERA.	It proposes the construction of political and pedagogical projects, the elaboration of training policies for professionals and the effective participation of the community and social movements in the field.
<b>Law n°. 12.695/2012.</b> It provides for the Union's technical or financial support in the ambit of the Articulated Actions Plan and contemplates with FUNDEB resources the comunitary institutions that work in rural education.	It guarantees the registration of rural institutions in the Fund for Maintenance and Development of Basic Education and Valorization of Education Professionals - FUNDEB.

Source: Brazil <sup>[25,26,27,28]</sup>

EC carries with it a conception of emancipatory education, which is part of a historical project that cannot be detached from social struggles. It aims to bring education closer to the challenges of building a society without exploitation<sup>[24]</sup>. According to Freire<sup>[10]</sup>, the educational process should be an ally to counteract social determinism.

The field is constituted as a meaning that incorporates forest, livestock, mining, and agricultural spaces, as well as fishing, caçara, riverine and extractive spaces<sup>[29]</sup>. A field that energizes the connection of human with the own production of the conditions of social existence<sup>[30]</sup>.

In this sense, discussing EC in the Amazon implies considering the complexity of the region, the sociocultural diversity and the multiple identity manifestations<sup>[31]</sup>. According to Cristo et al.<sup>[32]</sup> the Amazon has a very vast cultural wealth that is significantly expressed in the legends, dances and stories that compose the sociocultural imaginary of the populations.

However, all this wealth is ignored by the urban culture that gradually deconstructs and devalues the imaginary of these populations. This process of devaluation of the knowledge of traditional communities arises as a consequence of a historical process of submission of urban values over rural values<sup>[33]</sup>.

Since colonial times, the education of the Amazonian people as well as their culture has been denied and stereotyped. The problems and particularities of rural education in the Amazon have been occupied a marginal place in the scenario of public educational policies. This resulted in suppressed educational projects that are unable to overcome the existing scholar deficit in the region, nor does it respond to the identity process<sup>[31]</sup>.

Prazeres and Carmo<sup>[33]</sup> when analysing the Amazonian reality, they point out the insufficiencies of State action in the field, not only related to educational aspects, but also to other constitutional rights. It is observed that the State is incapable of attending to the great diversity and heterogeneity of rural people in the Amazon. This worrying consideration anchors the perspective that the offer of basic rights to the field follows the perspective of offering, as Sammarco et al.<sup>[34]</sup> emphasize, "a poor education to the rural poor".

According to Hage et al.<sup>[35]</sup>, the reality experienced by the subjects in the existing rural schools in the Amazon depict great challenges to be faced, and one of the first challenges is to enforce the operational milestones in the legislation. Despite the diversity of people and ethnicities in the region with different customs, there is a great precariousness in living, working, health and education conditions, which present a denouncing and worrying reality<sup>[33]</sup>.

In contrast to this, in recent years rural movements have grown in the Amazon. In the state of Pará, the Paraense

Movement for an EC, which agglutinates through the Forum Paraense of Rural Education, numerous entities from civil society, social movements, teaching institutions, research, governmental organs of development and educational area<sup>[36]</sup>. Such movement came to hold debates at state and also regional level, in order to discuss, elaborate and propose inclusive actions for rural people in the Amazon<sup>[31]</sup>.

We emphasize that the people of the Amazon, such as the indigenous, caçaras, quilombolas, riverside, rubber tappers, fishermen and shellfish gatherers, among others, configure in different ways of life. These actors live and coexist in an intimate relationship with the land, the river and the forest, in floodplain and dryland regions. As well as in settlements, communities, quilombos and indigenous tribes<sup>[36]</sup>.

This result in multiple educational and intercultural processes, new forms of subjectivity and knowledge. This knowledge which is most cases is not valued by the official educational system<sup>[31]</sup>. For these reasons, it is necessary to construct an educational curriculum that is adapted to the identity and reality of each rural people existent in the Amazon.

#### **4. Environmental Education as a Transversal Theme**

Environmental Education (EE) emerged in 1972 at the first United Nations Conference on the Human Environment in Stockholm, Sweden. It was considered an international historical-political landmark in the advance of alternatives to minimize the environmental problematic on the planet<sup>[8]</sup>. An event held by the United Nations (UN), which had representatives from 113 countries, and aimed to establish a global vision on environmental impacts and propose international agreements between countries. This was important in the sense of guiding the humanity on the importance of conservation in the environment for future generations<sup>[37]</sup>.

After this history, EE has become one of the most important contemporary educational demands worldwide. It has been widely discussed with proposals that reinforce the urgency to involve all sectors of society through public policies focused on the environment<sup>[38]</sup>. In Brazil, the EE was formalized by the Federal Constitution of 1988, in § VI of Chapter VI on Environment, which makes the public authorities responsible for "promoting environmental education at all levels of teaching and public awareness for the preservation of the environment"<sup>[21]</sup>.

From this, was created the National Political of Environmental Education (PNEA), the Federal Law number 9.795/99 which obligatorily insert to the National Curriculum Parameters (PCN's), the EE as a transversal content in Brazilian education. According to Article 2 of this

law, EE becomes “an essential and permanent component of national education, and must be present in articulated form at all levels and modalities of the educational process in formal and non-formal character” [11].

Corroborating with the PNEA, the Curricular Guidelines for Environmental Education (DCEA) which guide the role of universities in promoting Environmental Education in teacher training. In its article 11, “the environmental dimension must be part of teacher training curriculum at all levels and in all disciplines” [39]. As well as promote its actions of teaching, research and extension focused on the principles and objectives of EE.

When analyzing the inserting of EE in higher education, socio-environmental issues inherent to EE is still little contemplated [34]. Silva and Chelotti [40] affirm that the training of teachers does not give provide subsidies to foster EE, which causes gaps in teacher training. To work with EE, teachers must have skills in several areas of knowledge [16]. This professional must propose a way of working that enables students to be the subjects of their own history, understanding and transforming their world [41].

According to the (PCN’s), the teacher must contribute to the formation of conscious citizens, able to decide and act in the socio-environmental reality [25]. In this sense, it is extremely important in the training of teachers the continuing education in EE, which enables to fill gaps left in the graduation [12]. In addition, it fosters improvements in the practices of teachers and, consequently, in the training of students. Such students may experience different challenges proposed by teachers [42].

Therefore, it is up to the teacher to raise awareness and sensitize students about the environmental problems from the local to the global or vice versa. Thus also, develop knowledge, values and actions that promote changes in human behaviors in the space they occupy [8]. Freire [10] states that human being cannot actively participate in history, in society, in the transformation of reality if they are not helped to become aware of reality and of their own capacity to transform it.

Then, working issues such as fishing and aquaculture in rural schools, especially on the northeastern coast of Pará in a transversal way. They make it possible to build practices that solidify the importance of actions aimed at EE, mainly in the sense of discussing possible socio-environmental impacts on mangroves [8].

### 5. Fishing and Aquaculture as a Teaching Strategy

Fishing and aquaculture are important activities for human nutrition [43,44]. The first is defined as the extraction, collection

or capture of aquatic organisms from environments where they live, such as rivers, lakes, oceans, mangroves and beaches [45]. While aquaculture is a science that creates/cultivates as well as reproduces aquatic organism [44]. We emphasize that there are several modalities of fishing and aquaculture with the perspective of insertion in schools (Table 2 and 3).

**Table 2.** Fishing modalities.

Modality	Definition	Source
Artisanal	It is an activity exercised by autonomous artisanal fishermen, who have their own means of production using small vessels with relatively simple fishing gear.	Zacardi et al. [46]
Subsistence	It is an activity carried out by fishermen who the objective of fishing only for their own consumption, using rowing canoes or motorized canoes (rabetas).	Natividade et al. [47]
Commercial	It is an activity carried out by professional fishermen authorized by the state agency using large vessels, which target aquatic organisms of great commercial value.	Santos et al. [48]
Industrial	In this activity the company is responsible for all the means of production that normally congregates the stages of capture, processing and commercialization. It is performed by professional fishermen on large vessels that employ sophisticated navigation equipment.	Vieira [49]
Sport	It is an activity carried out by amateur fishermen exclusively for recreational purposes without commercial purpose and with vessels and equipment properly described.	Rodrigues et al. [50]

**Table 3.** Aquaculture modalities.

Modality	Definition	Source
Fish farming	Fish farming is a science that creates/cultivates fishes at any stage of its development, in confined and controlled environments.	Baldisserotto et al. [51]
Shrimp farming	Shrimp farming is a science that creates/cultivates crustaceans as shrimp at any stage of its development, in confined and controlled environments.	Maciel and Valenti [52]
Malacoculture	Malacoculture is a science that creates/cultivates (creation of molluscs such as snails and scallops, the creation of mussels is known as mytiliculture and that of oysters as an ostreiculture), at any stage of its development, in confined and controlled environments.	Rodrigues et al. [53] and Lima [5]
Chelonian farming	Chelonian farming is a Science that creates/cultivates chelonians at any stage of its development, in confined and controlled environments.	Magnusson et al. [54]
Frog culture	Frog culture is a science that creates/cultivates frogs at any stage of their development, in confined and controlled environments.	Cribb et al. [55]
Alligator farming	Alligator farming is a science that creates/cultivates alligators at any stage of its development, in confined and controlled environments.	Abrunhosa [56]
Algae culture	Algae culture is a Science that cultivates algae.	Paula et al. [57]



In Brazil, the fishing and the aquaculture are important economic activities that guarantee employment, income and food for many rural communities <sup>[13]</sup>. According to data released by the Anuário 2020 of the Brazilian Fish Farming Association (PEIXE BR), 722,560 tons were produced in 2019, with revenues average R\$ 5,6 billion. According to the same source, in recent decades there has been a stabilization in extractive fishing and a greater expansion in the production of cultivated aquatic organisms, resulting in a greater volume of supply <sup>[58]</sup>.

In the Amazon, it is common to use these activities for riverside and agricultural communities, where for many they represent the only source of income and familiar maintenance <sup>[47]</sup>. In this scenario, the state of Pará has become a protagonist in the production of fishing and aquaculture in the Amazon. Currently, is it responsible for 63% of fishing production in the region, with 90 million tons coming from extractive fishing and 30 million tons from aquaculture <sup>[58]</sup>.

From this perspective, working with Environmental Education involving fishing and aquaculture in rural schools in a region like the Amazon is essential in the socio-environmental formation of students <sup>[13]</sup>. According to the same authors, the role of the school with the teachers is approaching the theme of fishing and aquaculture, taking into account the socioeconomic and local cultural specificities. That is, think of methodologies and pedagogical materials that can be applied in an integral way, to the point that the student knows and understands how differentiate fishing and aquaculture <sup>[59]</sup>.

Therefore, according to the PCN's, the role of teacher is considering the knowledge that students already have to plan meaningful teaching and learnings situations <sup>[22]</sup> in order to strengthen the relationship of the theme with the student's experience <sup>[8]</sup>. Thus, to promote EE through social projects, creating strategies for a more useful socio-environmental education, in order to build a knowledge combination the past and the present to support a more balanced socio-environmental future.

## 6. Fishing and Oyster Farming Considerations

Among the fishing modalities, the artisanal fishing provides employment, income and food for several communities along the Pará coast, including in São Caetano de Odivelas and other municipalities in the state. It is an economically, culturally and socially important activity in the region <sup>[47]</sup>. Zacardi <sup>[46]</sup> points out that artisanal fishing suffer a lack of both biological and socioeconomic information, being important for the management of fishing

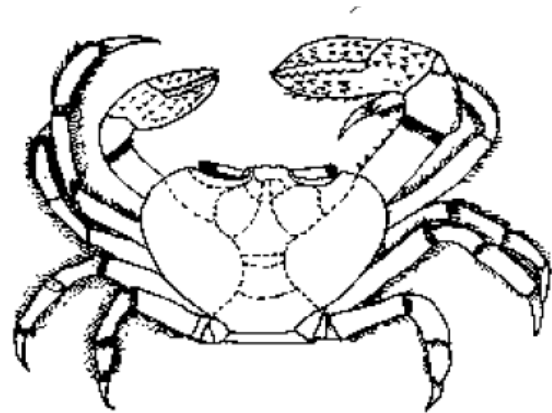
resources.

Different from what is thought about the dynamics of artisanal fishing, by understanding that it is a rudimentary form of animal extraction, this activity is of paramount importance for present social, environmental and economic relevance in riverside communities that develop such activity <sup>[47]</sup>. Bonfá Neto <sup>[43]</sup>, points out that artisanal fishing should be thought and understood not only as a direct act of extracting a product from the waters, but as an activity that structures a complex production chain (fishes, mollusks, crustaceans and shellfish) transforms, benefits, distributes, exchanges and markets.

Regarding the main exploitable resource of fishing, there is a high diversity of fish species in the estuary of northeastern Pará, because this region includes the grouping of aquatic ecosystems (rivers, lakes and streams), floodplains, dry land, beaches and magroves <sup>[1]</sup>. It also highlights the abiotic factors such as tidal regime and rainfall resulting in a dynamic environment, providing the formation of the complex aquatic food chain rich in nutrients <sup>[46]</sup>.

Cruz et al. <sup>[3]</sup> note that artisanal crab fishing is one of the most important extractive activities in rural communities of the Pará coast, not only for subsistence, but also for marketing. In São Caetano de Odivelas, 20% of the municipality's population depends directly on the extraction, processing, transportation or commercialization of the crustacean market <sup>[4]</sup>.

The uça crab (*Ucides cordatus* Linnaeus, 1763) (Figure 1), is a crustacean that lives in magrove areas burrowing in individual galleries <sup>[8]</sup>. According to Maciel <sup>[1]</sup>, its capture is carried through different rudimentary techniques, which are subsequently stored and transported for commercialization.

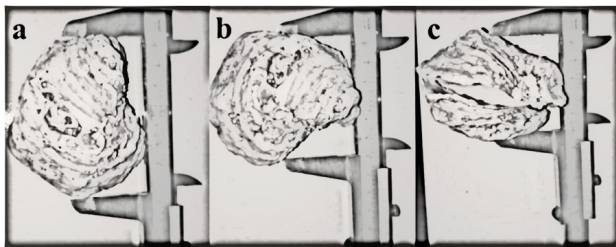


**Figure 1.** *Ucides cordatus* crab. Source: adapted by Nascimento <sup>[60]</sup>.

Another activity that has been gaining prominence

in São Caetano de Odivelas is the creation of bivalve mollusks based on oyster farming or cultivation of mangrove oysters (*Crassostrea gasar*) being developed in the communities of Perurú de Fátima and Alto Perurú<sup>[5]</sup> (Figure 2). Oyster farming is an activity that generates income and contributes to the conservation of estuaries, reducing the pressure about the natural stocks and promoting a sustainability exploitation of the environment<sup>[61]</sup>.

Currently, oyster farming has been practiced in six communities in the municipalities of Augusto Corrêa, Curuçá, Salinópolis, Maracanã and São Caetano de Odivelas, located in the Northeast Paraense Mesoregion<sup>[62]</sup>. According to Lima<sup>[5]</sup> seed collection is carried out in the natural environment. Subsequently, they adopt the suspended system of the fixed type and market the product.



**Figure 2.** Measurements of the oyster *Crassostrea gasar*: a) height (mm), b) length (mm) e c) width (mm). Source: Macedo et al.<sup>[7]</sup>.

According to data from the Brazilian Institute of Geography and Statistics (IBGE), in Pará, 80 families are benefited to generate income from oyster farming<sup>[63]</sup>. This same source considers that there is an annual production of 41,802 tons, with emphasis on the municipalities of Augusto Corrêa, Salinópolis, Curuçá and São Caetano de Odivelas, which together represent 79% of the production in the state. In this way, these municipalities contribute to the income of many rural communities and preserve the mangrove ecosystem.

Therefore, the fishing and the oyster farming are human activities that allow greater proximity to the nature. Due to this knowledge, it guarantees fishermen and oyster farmers the interaction of man with nature, being essential this theme in rural schools.

## 7. Challenges and Perspective of Fishing and Aquaculture Teaching in Education

Working with EE involving fishing and aquaculture in rural schools in our country is a great challenge, since the precariousness of the institutions added to the lack of teaching materials has been influencing the discouraging performance of teachers and also students<sup>[8]</sup>.

Through this, it is also necessary to remember the

responsibility and the share of commitment that refers to public managers to assume more effectively their role in promoting the valorization of education in its totality, bringing tangible and empirical results of improvements in the educational framework at: municipal, state and federal levels<sup>[64]</sup>.

Starting from the assumption that EE favors the socio-environmental awareness of the student to the extent that it provides tools and possibilities for them to realize themselves in nature and their responsibility towards its<sup>[8]</sup>. Silva and Santos<sup>[65]</sup>, report that teachers must perform a work together with high expectations in relation to teaching-learning, having the mangrove, fishing and aquaculture as a reference to they offer for the students an environmental education that allows them to open paths for their personal fulfillment and social well-being.

In this sense, searching for new techniques and practices of environmental education related to socio-environmental issues in schools, especially in rural areas, is of fundamental importance to develop pedagogical intervention projects aimed at the training of students. According (Table 4) are some works about techniques and practices of environmental education at school.

**Table 4.** Works about techniques and practices of environmental educational.

Researches	Work title	Author
	Incentive to learning from student interaction– fisherman as a pedagogical practice.	Silva and Santos <sup>[65]</sup>
Fishing	From fishing to school: an experience of collective construction of knowledges in traditional fishing communities in the Paraense Amazon.	Vieira and Neves (2017) <sup>[66]</sup>
	Fishing and Aquaculture: environmental education techniques in elementary school, in Marajó (PA).	Miranda et al. <sup>[13]</sup>
Aquaculture	Elaboration of a booklet as an educational material for the preservation of the green turtle ( <i>Cheloniemydas</i> ) in Itaipú, Niterói, Rio de Janeiro.	Silva et al. <sup>[62]</sup>
	Environmental education and analysis of mangrove ecosystems with basic education students.	Oliveira et al. <sup>[8]</sup>
Mangrove	Effectiveness of practical environmental education actions for the mangrove ecosystem in elementary school.	Silva and Maia <sup>[9]</sup>

Source: Elaborated by author.

Currently, one of the biggest challenges faced by teachers working in rural schools when working on environmental education is the lack of pedagogical materials<sup>[67]</sup>. According to Santos<sup>[68]</sup>, it is up to the teacher to seek new teaching strategies that aim to stimulate the students to know the socio-environmental problems of their commu-

nity. The importance of the construction of pedagogical materials that seek to rescue the student's protagonism is emphasized<sup>[69]</sup>. A document that encourages them to indignations and concern about the environment, starting from their community/location.

Among the methodologies and educational materials that can be used involving fishing and aquaculture we can highlight: the video lessons, the field trips and the pedagogical booklets<sup>[67]</sup>. This provides an excellent opportunity for teachers and students to learn in a different fun way about the importance of fishing and mangrove oyster farming in their communities<sup>[70]</sup>.

## 8. Booklet as a Pedagogical Tool in Education

The booklet is a pedagogical tool with a simple, easy understanding and didactic language that clarifies doubts through explanations and illustrations. It is a way to reflection on a proposed theme<sup>[61]</sup>. According to Uyeno et al.<sup>[70]</sup>, the thematic booklets have been increasingly used as a pedagogical material especially by basic education teachers in

The use of the booklet becomes an important allied in the teaching and learning process. This material awakes in the student the attention, the curiosity, the interest in what is portrayed in a more relaxed and objective way, thus collaborating in the construction of knowledge<sup>[67]</sup>. Reis et al.<sup>[61]</sup> affirm that booklets are able to develop critical thoughts in students, besides illustrating several realities, alerting and sensitizing the reader about the consequences of human actions in nature. For Silva et al.<sup>[62]</sup>, the booklet reminds students a scenario closer to their reality, becoming a great for environmental education.

Finally, the booklet in promoting environmental education in rural schools it can be used with a simple and easy-understanding plot, with the purpose of being applied both in school environments and to general public<sup>[62]</sup>. In this sense, the elaborating of pedagogical booklet of EE in the mangrove with focus on fishing and oyster farming is essential. This document becomes an important tool to be elaborated and used by teachers in rural schools. Since it guarantees the right to communication. It also assists in several curricular practices<sup>[67]</sup>.

## 9. Conclusions

This study enables the use of fishing and aquaculture as a teaching strategy for rural school through environment education. The realization of researches that seek to insert themes into the EC curriculum is important to foster fishing activity in the community, as well as the sustainable use of natural resources.

The activities focused on rural education seek to rescue the social role as well as the integration of community to assist and stimulate fishing production in mangrove areas, to improve the quality of basic teaching. We believe that EE should be interdisciplinary and involve the responsibility of everyone.

We suggest the use of pedagogical booklets on environmental education to be used in rural education. Such a pedagogical product will provide an excellent opportunity for teachers and students to learn in a different and fun way, about the importance of fishing and oyster farming in the mangrove in their communities and municipality.

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## Declaration of Interest

The authors have no conflict of interest to declare.

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