SCHOOL GARDENS AS A STRATEGIC IN ENVIRONMENTAL EDUCATION AND CULTURAL IDENTIFY IN A RURAL SCHOOL THE MUNICIPALITY OF PORTEL, MARAJÓ MESOREGION

https://doi.org/10.63330/aurumpub.032-005

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Abstract

This study corresponds to an Environmental Education practice at the Adelson Fernandes Municipal Elementary School, located in the Bom Remédio Community in the municipality of Portel-Pará, in the Marajó Mesoregion. Its objective was to raise awareness and develop critical thinking and citizenship skills in children aged 6 to 11 regarding socio-environmental issues such as sustainability, agroecological food, and improving quality of life. The methodological practice was characterized as an innovative and meaningful learning method by highlighting the importance of healthy, sustainable, and responsible

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consumption through the use of a school garden. This non-formal educational tool allowed these elementary school students to take the lead through experiences and the construction of systematized and interdisciplinary knowledge to foster socio-environmental awareness. Prior to this, lectures were held on topics related to the environment and agroecological management. Finally, a questionnaire was administered to the students, and the results demonstrated the importance of family farming for sustainability. It was concluded that the school garden represented a strategic element for the preservation of the exuberant and valuable marajoara culture, nutritional balance, and environmental conservation, guaranteeing the future of future generations.

Keywords: Environmental Education, Interdisciplinarity, Sustainability, School Garden, Marajó Mesoregion.

INTRODUCTION

Actions within the school context should provide a sense of constructing an educational vision that offers access to socio-environmentally relevant knowledge, enabling children's integral development according to conditions of social vulnerability (Bertazzo and Wiezzel, 2025). Therefore, Early Childhood Education is considered the best stage for educational interventions, since tastes, personality, and decisions are influenced by lived experience with the environment (Santana et al., 2022).

Recognizing the school as one of the pillars sustaining cultural, social, ethical, and autonomous development, the construction of pedagogical practices capable of sensitizing students from the earliest school years becomes relevant. This should encourage them to observe environmental reality through critical and questioning lenses. Sustainability must be the foundational principle for the formation of transformative agents and participatory citizens (Silva, Sherer and Galle, 2025).

The modern world, marked by unrestrained consumerism, has been one of the main drivers of environmental degradation and the depletion of natural resources. In response to this global challenge, Environmental Education (EE) emerges as a powerful tool capable of mitigating the negative impacts of

this trend (Gomes, Magalhães Júnior and Triani, 2025). In this context, it is necessary for Environmental Education (EE) to be addressed from Early Childhood Education onward, so as to enhance children's imagination in order to re-signify the human–nature relationship and enable improvements in the quality of life of future generations through everyday attitudes, such as adopting sustainable eating habits (Oliveira et al., 2024).

In view of this, it is necessary to promote activities that bring children closer to environmental components (abiotic and/or biotic), and the school garden can be cited as an example of such activities (Souza et al., 2021). The development of a school garden, as a practical activity for students, makes it possible for them to analyze ways of achieving more promising outcomes regarding environmental issues. Moreover, Environmental Education becomes a challenging activity in the practical dimension of students' knowledge, as it fosters competencies focused on environmental conservation and student engagement through interdisciplinary environmental practices (Moura et al., 2025). Therefore, implementing school gardens is an agroecological practical activity that reinforces feelings of belonging and identity and reaffirms the school's role as a formative space capable of transforming realities (Pantoja, Pantoja and Brito, 2025).

Teaching activities in a school garden help students understand the dangers of using agrochemicals for human health and the environment. Thus, they stimulate awareness of the need for environmental preservation and the development of the capacity to work in teams and cooperate. This provides greater contact with natural resources and reflections on their uses (Queiroz et al., 2020). Furthermore, the garden in the school environment enables inquiry-based teaching, since it allows students and teachers to leave the monotony of the classroom to experience moments of collaborative and reflective interaction in a natural environment, and to be concerned with social well-being, as well as socio-environmental balance and the guarantee of natural resources for future generations (Brasil and Scareli-Santos, 2023).

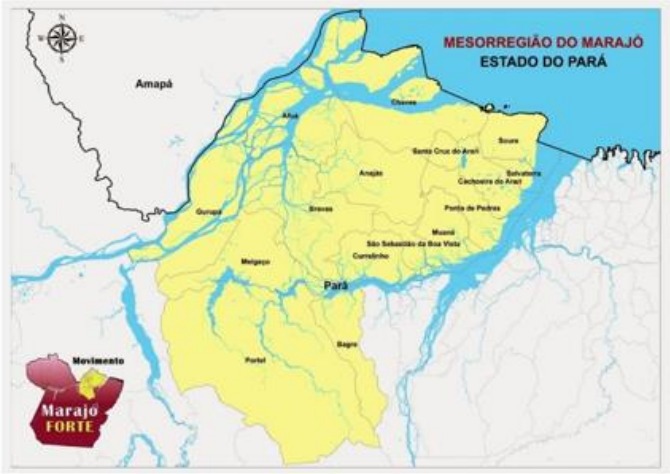
Gardens in the school environment are agroecological spaces that seek to value cognitive construction. They are sustained by critical reflection, aimed at the emancipation of subjects and collective conditions grounded in healthier eating habits and the adoption of responsible environmental conduct (Sousa et al., 2018). Thus, the present work aimed to promote environmental education through the construction of a garden at the Adelson Fernandes Municipal Elementary School (EMEF), located in the rural area of the municipality of Portel, in the Marajó Archipelago; as well as to stimulate interest in healthy eating and the production of organic foods and, at the same time, contribute to the use of spaces and sustainable, collaborative, and co-participatory principles among children, as well as strengthening cultural identification and a sense of belonging to the Marajoara territory.

METHODOLOGY

The municipality of Portel (latitude 01º56'08'' South and longitude 50º49'16'' West) is the second largest in the Marajó Mesoregion and is located 324 km from Belém, the capital of the state of Pará, with access occurring by river. The population of Portel engages in activities related to agriculture, plant extractivism, fishing, and tourism (Brasil, 2022).

Figure 1

Map of the location of the municipality of Portel in the Marajó Mesoregion



Source: MOVIMENTO MARAJÓ FORTE, 2024.

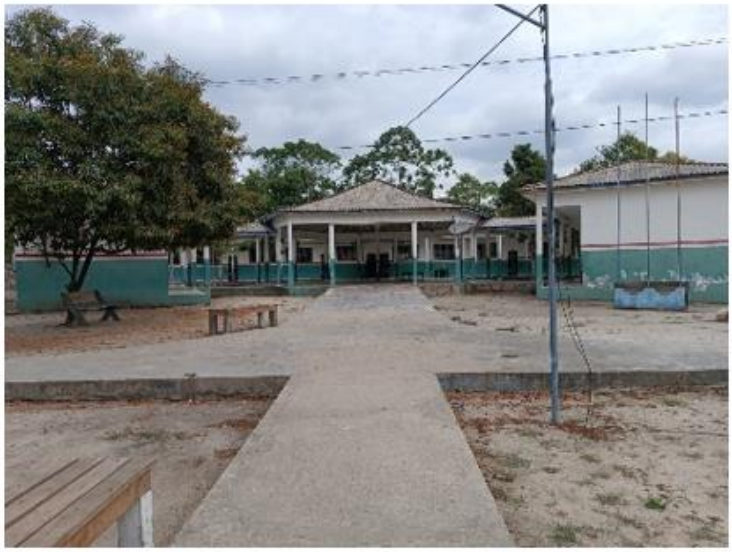
The climatic classification of the municipality of Portel, according to the Köppen classification, is Af, characterized as humid tropical, which presents high temperatures and abundant rainfall throughout the year, with the period of highest rainfall index occurring between October and April, with annual climatic averages of temperature of 29ºC, relative humidity of 80%, and average annual rainfall of 2200 mm (Portel, 2025).

The municipality of Portel possesses immeasurable environmental heritage, with a vast forested area. It encompasses the Anapu, Camairapi, Pacajá, and Acutyperera rivers and, along their banks, there are freshwater beaches and bathing areas that constitute a real picture of spontaneous beauty, which qualifies it to be part of the Marajó Tourism Pole. This Marajoara municipality attracts tourists through a cuisine shaped by local fish, and the richness of the people of Portel is another legacy left by Indigenous peoples (Castilho and Mello, 2024). According to IBGE (2022) data, Portel has a population of 62,503 people, with 52.5% residing in rural areas.

The work was carried out at the Adelson Fernandes Municipal Elementary School (EMEF) (Figure 2), located in the Bom Remédio Community, Marajó Mesoregion. The activity was developed by students from the Full Teaching Degree in Rural Education and from the Environmental Management Technology program, who assisted the teachers of the aforementioned educational institution in developing the school garden, assessing socio-environmental impacts and emphasizing the importance of awareness regarding environmental disasters and agroecological management, since this practice aligns with the graduate profiles of the two higher education programs of the Federal Institute of Pará – Breves Campus. The community is located on the right bank of the Camaraipi River, in the Bay of Portel, and is characterized as a rural area of the municipality of Portel, Pará (PA).

Figure 2

Adelson Fernandes Municipal Elementary School (EMEF), rural area of the municipality of Portel



Source: Authors, 2023.

The activities were conducted between January and August 2023 and targeted elementary school students at a rural school in the municipality of Portel, in the Marajó Archipelago. The present study is grounded in a qualitative approach and supported by participatory research methodology. It is characterized by the researcher being in loco and involved in the real experiences of the participants, by the use of multiple and interactive methods, by descriptive results, and by holistic analysis of social phenomena, according to Rodrigues, Oliveira; Santos, 2021.

The students who participated in the activities of implementing and maintaining the garden were aged 6 to 11 years and were enrolled from the 1st to the 5th school year. On average, the classes comprised 40 students, totaling 200 students participating in this research. Activities with the students took place once a week.

For the implementation and maintenance of the garden, materials and vegetable species were used (Table 1). It is worth noting that some species, such as jambu, ora-pro-nóbis, cipó-kubá, and chicória, belong to the group of plants known as PANC (Unconventional Food Plants), because they are plants of regional importance and typical dishes in the Brazilian diet can become more nutritious, according to researchers (Subtil, 2022). Therefore, introducing these species aims to maintain food culture in the

Marajó Mesoregion, given that dishes such as saltadinho marajoara (Almeida, 2018). Indeed, the Marajó Regional Public Hospital maintains a garden of 180 square meters that produces 80% of the vegetables consumed by patients at this hospital; according to the head of the Nutrition and Dietetics Service of the hospital unit, contact with a pesticide-free garden enables children's biopsychosocial development and raises awareness about the importance of preservation and interaction with the environment (Vilanova, 2023).

Table 1

Materials used and vegetables cultivated in the school garden at Adelson Fernandes Municipal Elementary School (EMEF)

Materials	**vegetables**	
	Common name	**Scientific name**
Rake	Abiu cutite	*Pouteria macrophylla*
Wheelbarrow	Lettuce	*Lactuca saliva L.*
Transplanting trowel	Leek	*Allum ampelosarum var. porum*
Hoe	Cheiro-verde	*Petroselinum crispum*
Sickle	Chicória	*Eryngium foetidum L.*
PET bottles	Cipó-kubá	*Cissus gonglyodes Burch*
Nylon line	Kale	*Brassica oleraceae L.*
Hose	Hortelãzinho	*Mentha pulegium L.*
Measuring tape	Limão galego	*Citrus medica L.*
Saw	Ora-pro-nós	*Pereksia aculeata*
Pine boards	Black pepper	*Piper nigrum L.*
Wood hooks 13 × 30		
Headed nails 16 × 24		
NPK fertilizer		
Disposable cups		

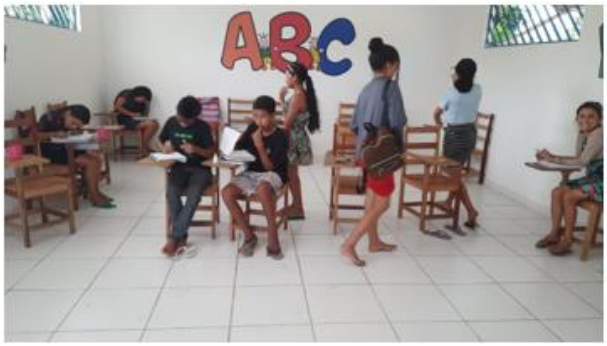
Source: Authors, 2023.

Before implementing the garden at Adelson Fernandes Municipal Elementary School (EMEF) and the maintenance activities, educational lectures were delivered in a formal setting (the classroom). Thus, the lectures aimed to highlight the importance of the school garden as a space for environmental awareness and the production of agroecological foods. In addition, waste management was addressed (use of organic compost and PET bottles – polyethylene terephthalate) and the general characteristics of the vegetable species that would be implemented (Figure 3). At the end of the lectures, students answered a questionnaire whose questions sought to investigate whether they had already cultivated or intended to

invest in vegetable cultivation in the future and, primarily, the relevance of the garden for the environment.

Figure 3

Presentation of the importance of the school garden through educational lectures



Source: Authors, 2023.

After the period of educational lectures, the second step was the construction of the school garden and the execution of activities in this open space, carried out by the members of this article together with students and teachers of Adelson Fernandes Municipal Elementary School (EMEF). The activities followed these stages: soil preparation; sowing—during which sowing methods were presented; planting; and general plant care up to harvest. In this way, throughout all processes, students were able to become familiar with different plants, as well as strengthen their contact with nature. In addition, introducing vegetables into the preparation of school meals was encouraged. At the end, a questionnaire was administered to learn about the importance of agriculture for the environment.

Each “bed,” with dimensions of 1.2 m in width and 0.25 m in height, of the suspended school garden (Figure 4) was filled with moinha or açaí fertilizer, using the foliar fertilization technique (using NPK, at a dosage of 7 ml per liter of water) every 15–20 days, totaling a period of 120 days. The vegetables were selected in this study due to a prior assessment of the diet of residents of the Bom Remédio Community, and the spacing for each crop was 30 cm. For irrigation, a hose was used, and the vegetables were irrigated twice a day, in the morning (around 9 a.m.) and in the afternoon (around 5 p.m.).

Figure 4

Stages of the cultivation process in the school garden at Adelson Fernandes Municipal Elementary School (EMEF)

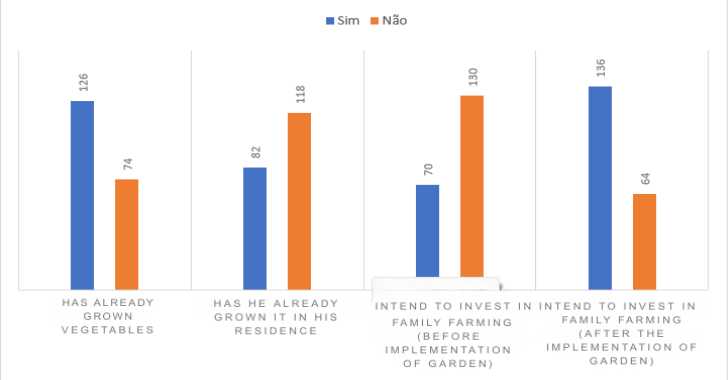
Source: Authors, 2023.

RESULTS AND DISCUSSION

Administering the questionnaire to understand students' opinions was the first step toward implementing the garden. This made it possible to assess their interest in the research. At the beginning of the implementation of the school garden project at Adelson Fernandes Municipal Elementary School (EMEF), the 200 students were asked about their consumption of vegetables (Figure 5) and whether they recognized the importance of regular vegetable intake.

Figure 5

Responses of the interviewed students regarding the importance of the garden



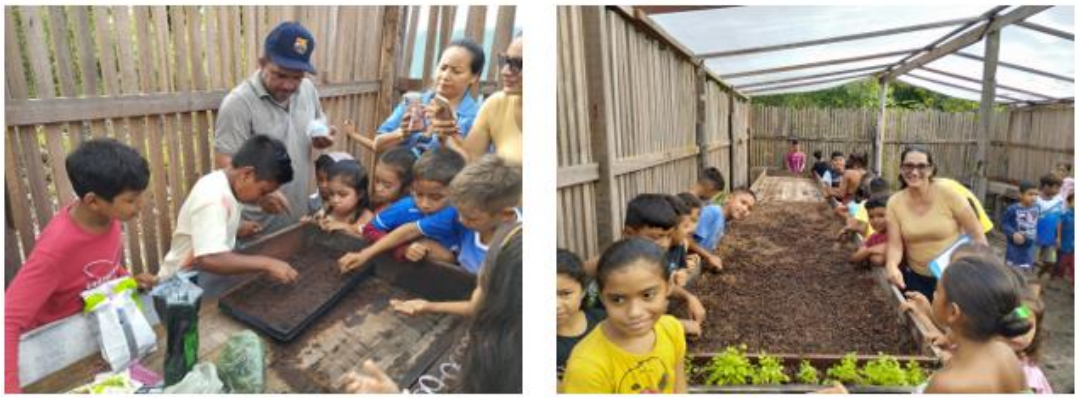
Source: Authors, 2023.

As shown in Figure 5, 63% of respondents (a total of 126 students) already had the habit of cultivating vegetables and, notably, 41% of respondents (a total of 82 students) reported helping their parents in farming. It is important to highlight that the percentage regarding the importance of family farming rose from 35% (a total of 70 students) to 68% (a total of 136 students) among students after the agroecological practices in the school garden were conducted. Thus, the school garden is a tool for integrating students through teaching and nutrition in a practical and educational experience. It serves as a strategy for environmental education, contributing to sustainable development, the formation of students' critical thinking, and the promotion of healthy eating (Freire, Batista and Silva, 2024).

According to Oliveira et al. (2025), sustainability must be integrated into school curricula as an essential theme for constructing a society that is more responsible for its attitudes, where there is concern about the consequences of human actions on the environment and how these consequences can directly affect human beings' quality of life, not only in the present but also for future generations. Therefore, in the school environment, children construct meanings, learn to regulate their emotions and resolve conflicts, create responsibility for social and collective well-being, and develop skills based on ethical, democratic, sustainable, and inclusive principles (Sá and Hermógenes, 2021). In this sense, didactic-educational activities in the school garden contribute to improvements in the teaching–learning process due to greater interdisciplinarity, raising students' awareness of environmental problems and modifying eating habits (Cancelier et al., 2023), given that teachers at Adelson Fernandes Municipal Elementary School (EMEF) related the theoretical components of their subjects to practices in the garden, as can be seen in Figure 6.

Figure 6

Active participation of teachers at Adelson Fernandes Municipal Elementary School (EMEF) in the school garden



Source: Authors, 2023.

Regarding the implementation and maintenance stage of the garden, students' interest in carrying out the activities was verified. This occurred due to their active participation in the development of agroecological techniques such as soil preparation, sowing, and planting, as well as daily management (care) of the cultivation (Figure 7). Furthermore, it is emphasized that one of the factors that made implementation and care of the garden feasible was the participation of teachers and technical staff at Adelson Fernandes Municipal Elementary School (EMEF), because although children were actively participating in the activities, the absence of more in-depth technical knowledge and practices would have hindered the execution of certain activities, such as fertilization, a fact that could compromise production.

Figure 7

Early Childhood Education students' protagonism in the Environmental Education process

Source: Authors, 2023.

Additionally, regarding aspects of vegetable production, it is emphasized that crops were produced following principles of organic food production. On this occasion, the importance of producing this type of food for environmental preservation and health promotion was highlighted. For example, jambu and leek are ingredients in the delicacy saltadinho marajoara (Almeida, 2018). Taturubá, popularly known as abiu-cutite, is native to the Amazon region. It has high nutritional and commercial value (Castro et al., 2014). It has been the subject of research for the pharmaceutical industry (Carvalho, 2023). It can be found in the Caxiuanã Forest (Silva, Carvalho and Yared, 2001), which is a federal conservation area in Brazil located in the northeast of the state of Pará, in the municipalities of Portel and Melgaço (Brasil, 2023).

CONCLUSION

After analyzing this research, it was possible to identify several benefits that an organic school garden can bring to the school's pedagogical, productive, and recreational context, such as:

- Natural foods free of agrochemicals (food health);
- Reduces spending on food and complements school meals;
- Awakens and stimulates socio-environmental awareness (Environmental Education);
- Values collective work, the social responsibility of the agents involved (socialization), and the formation of citizenship allied to sustainability;
- Enables theoretical and practical pedagogical activities with Meaningful Learning.

Carrying out environmental education activities, having the school garden as a consolidating focal point for forming citizens who are more sensitive and responsible in promoting environmental conservation, as well as being multiplying agents of such conservation, proved to be a feasible space capable of achieving these purposes.

Through the development of valuable activities for the teaching–learning process in the sustainable garden at Adelson Fernandes Municipal School (EMEIF), which is located in the municipality

of Portel, children's feelings of belonging and humanization were strengthened. In addition, traditional knowledge related to food production and valuing rural life was developed. Moreover, children were introduced to a new relationship with food, the environment, and society in a holistic manner, through creative activities that constitute support points for their growth because they make sense throughout the surrounding school community, when they recognize themselves in local culture and understand that they are agents capable of modifying socio-environmental reality. Finally, this non-formal space contributed to valuing and preserving the exceptionally rich and exotic Marajoara cuisine, which is a cultural landmark for the promotion of tourism in the Marajó Mesoregion.

Therefore, developing this theme in school environments is fundamental to assuming a commitment to everyone, promoting integral education, transdisciplinary and sustainable knowledge, in pursuit of quality environmental and nutritional education. For this, it is necessary that school management, teachers, students, and the community be engaged in actions that seek balance between environmental preservation and economic activities, meeting the demands of the twenty-first century.

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