

AN AGROECOLOGICAL GARDEN: CREATING EXPERIENCES IN LEARNING FROM THE PERSPECTIVE OF SUSTAINABLE DEVELOPMENT

Priscila Coutinho Miranda^{a,b}, Camila Santos Fidelis de Souza^a, Nailda Rodrigues dos Santos^a, Terezinha do Carmo Santos^a, Thiago Barros Murari^b

^a Instituto Federal de Educação, Ciência e Tecnologia Baiano (IF Baiano), Brazil

^b Serviço Nacional de Aprendizagem Industrial (SENAI/CIMATEC), Brazil

Abstract: The objective of this work was to implement, at IF Baiano, the social technology known as Agroecological Integrated and Sustainable Production (PAIS) with the intention of creating an experimental and interdisciplinary space with various research approaches. A team of volunteer interns, scholarship holders, and coordinating faculty members met weekly to discuss implementation and monitoring actions of the project and conduct studies in various areas of knowledge. A chicken coop was planned and set up, garden beds were installed, and seedlings of various vegetable plant species were produced. The project contributed to the realization of interdisciplinary practical activities, as well as promoting scientific knowledge and the dissemination of information about sustainable development within the internal and external community of IF Baiano.

Keywords: Agriculture; agroecology; agricultural education.

UMA HORTA AGROECOLÓGICA: CRIANDO EXPERIÊNCIAS EM APRENDIZAGENS NA PERSPECTIVA DO DESENVOLVIMENTO SUSTENTÁVEL

Resumo: O objetivo deste trabalho foi implementar, no IF Baiano, a tecnologia social Produção Agroecológica Integrada e Sustentável (PAIS) com o intuito de criar um espaço experimental e interdisciplinar, com diferentes enfoques de pesquisa. Uma equipe de estagiários voluntários, bolsista e docente coordenadora reunia semanalmente para discutir ações de implementação e acompanhamento do projeto e realizar estudos em diferentes áreas do conhecimento. Planejou-se e instalou-se galinheiro, canteiros e produziu-se mudas de diversas espécies vegetais olerícolas. Pudemos observar que o projeto contribuiu para a realização de atividades práticas interdisciplinares, bem como para fomentar o conhecimento sobre sustentabilidade.

Palavras-chave: agricultura; agroecologia; ensino agrícola.

1. INTRODUCTION

In the Brazilian semi-arid region, irregular rainfall distribution, coupled with the lack of water storage infrastructure and high evaporation rates, are limiting factors for agricultural production, demanding innovative criteria for technologies.

In this perspective, educational institutions, especially those focused on agricultural sciences, play a crucial role by recognizing that these students can act as disseminators and promoters of the knowledge acquired in educational settings. Thus, they can contribute to the social transformation of their local communities and territories.

In this context, the idea of constructing a garden based on the technology of Agroecological Integrated and Sustainable Production (PAIS) was considered at the Baiano Federal Institute of Education, Science, and Technology, Campus Bom Jesus da Lapa. The PAIS Program, which stands for Agroecological Integrated and Sustainable Production in English, is disseminated throughout Brazil through a partnership between Sebrae (Brazilian Micro and Small Business Support Service), Fundação Banco do Brasil (Bank of Brazil Foundation), and the Ministry of National Integration. It represents a social technology that, depending on the location of implementation, exhibits variations in the cultivated products. However, its foundation lies in integrating animal and plant production and adhering to agroecological management principles, utilizing productive designs in mandala format [1].

This choice was made due to the fact that PAIS has proven to be an excellent means for production, generating employment and income in family farming, while also promoting environmental preservation. Furthermore, this technology can also be implemented in small spaces. In this system, food production is diversified, with the cultivation of legumes, vegetables, fruits, and other plant species, combined with integrated poultry farming.

In educational spaces, this technology has proven to be important and has already been implemented in some schools in the Northeast region, especially in schools with technical training programs for professionals in agroecology, agriculture, and agronomy, such as the Campus of Bom Jesus da Lapa. The dissemination of these techniques and the incorporation of the working methodology are necessary among students and faculty members of the Campus, as it is a system that seeks to contribute to the restoration of the dignity of families, facilitating actions that lead to better opportunities for rural livelihoods.

2. METHODOLOGY

The project was implemented at the Federal Institute of Education, Science and Technology (IF Baiano), Campus Bom Jesus da Lapa. It was installed in an area close to the classroom buildings to facilitate student access to the production area for constant monitoring. The execution of activities began at the end of 2017, with the participation of 16 volunteer students and scholarship interns, 14 of which were technical courses in agroecology and agriculture, integrated into high school and higher education, and the bachelor's degree in agronomic engineering. Figure 1 shows the implantation of the chicken coop in the project space.



Figure 1. Implementation of the chicken coop in the PAIS area.

The demarcated beds, based on the center of the chicken coop, were fertilized with goat and cattle manure and later covered with grass clippings to prevent the growth of spontaneous plants and protect the soil.

Simultaneously with the preparation of the beds, the students learned how to make the substrate for the production of seedlings and about care for transplanting them.

After the implementation of the PAIS (Figure 2), work was carried out with the professor of agricultural entomology to identify the insects present in the garden area and assess the damage they caused to the cultivated crops. The objective was to define alternative control strategies using bioinsecticides. Additionally, the natural enemies present in the area were identified, emphasizing their importance in maintaining the environmental balance.



Figure 2. PAIS implemented at Campus Bom Jesus da Lapa.

The harvests were always carried out by the students during the practical classes of the SIPV I discipline or during internship activities. For this task, the students received training on the proper handling of harvesting and post-harvesting of vegetables. Subsequently, all the produce was weighed and delivered to the campus cafeteria.



Figure 03. Vegetables harvested with the project on campus.

For data collection, information contained in the students final reports was used. As observation instruments, records of interdisciplinary practical classes were made, as well as student internship activities and discussions generated during team meetings.

3. RESULTS AND DISCUSSION

In the conception of sustainable development, educational institutions can play a role in training professionals from a participatory, critical, and citizen-oriented perspective. According to [2], universities and other development agencies can contribute by fostering scientific knowledge and disseminating information, training agents of sustainable development, supporting the formulation of public policies, and encouraging the expansion and improvement of social control mechanisms.

Absolutely, school responsibility in this process is essential, as we need to build a generation of individuals who genuinely understand the environment in which they are immersed. This entails promoting the appreciation of the territory and local resources (natural, economic, human, institutional, and cultural) that form the local potential for improving the quality of life for everyone. It is crucial to have a deeper understanding of this potential in order to arrive at a form of sustainable development that is suitable for the local, regional, and global context [3].

In this context, the use of school gardens as a space for the formation of individuals can constitute a playful activity that ignites their interest in applying various classroom concepts to different environments. According to [4], practical lessons allow students to move from a position of mere spectators to active participants in all stages of their learning process. In this regard, [5] states that school gardens, in turn, are hybrid and dynamic spaces, promoting meaningful learning that surpasses the traditional banking model of education. They contribute to the development of critical and reflective citizens within a Freirean context.

Furthermore, it should be added that the use of didactic tools such as the school garden allows the communication of theory with practice, giving purpose to the school content, which characterizes the transposition of concepts and the ability to develop skills. In this sense, theory and practice definitively intertwine in the liberating education of individual.

On the other hand, there is a gap between the contents covered in agrarian science classes and the reality of students, especially those living in semi-arid regions, where the school curriculum often fails to connect with their daily lives. This discrepancy frequently justifies the growing disinterest in these fields. The lack of motivation also impacts the pedagogical practice of teachers, creating a cycle of actions that increasingly restricts the educational process and consequently separates the students from their environment, their place, and their territory.

In this context, there is the proposal of professional and technological education offered by the Federal Institutes as a foundational aspect of development and a reflection of it. This includes the social function of scientific and technological production and the significance of institutions of professional and technological education in energizing territories and promoting social innovation. These elements are crucial when considering tactics and strategies for development within the Brazilian and Brazilian semi-arid contexts.

The project has yielded significant results regarding raising awareness among campus students about the possibility of promoting food production without the use of agrochemicals. This perspective aligns with what [1] advocates, which states that the training of specialized technicians and professionals from various fields of knowledge is intertwined with education for citizenship. These professionals will be prepared to act conscientiously, aiming to make human interventions sustainable, while considering the overcoming of social inequalities, environmental risks, and the preservation of ecosystem balance as parameters of sustainability.

4. CONCLUSION

The social technology PAIS served as a didactic tool to promote improvements in the teaching-learning process of the campus students, strengthening the relationship between theory and practice with the perspective of fostering sustainable local development. We are aware that we are still in the early stages of consolidating our studies and research, using agroecological gardens as didactic tools for the education of students in technical and higher education courses in agrarian sciences. Nevertheless, we are happy because we believe in the potential of these actions within the academic community.

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5. REFERENCES

¹NDIAYE, Aly; GUERRA, José Guilherme Marinho; DE ASSIS, Renato Linhares. Programa PAIS–Produção Agroecológica Integrada e Sustentável: estratégia para geração de renda, segurança alimentar e nutricional em sistemas de produção familiar. **Cadernos de Ciência & Tecnologia**, v. 39, n. 1, p. 26928, 2022.

²MUTIM, Avelar Luiz Bastos. Educação Ambiental e Gestão de Sociedades Sustentáveis: análise da articulação de processos educativos formais e não formais como estratégia para a gestão do desenvolvimento local sustentável. **Revista da FAEEBA**, v. 16, n. 28, p. 113-119, 2007.

³ DOWBOR, Ladislau. Education and Development. In: **Journal of Municipal Administration**, fev./mar, 2006. 16 p.

⁴ DE SOUZA, Ana Paula Azevedo et al. A necessidade da relação entre teoria e prática no ensino de ciências naturais. **Revista de Ensino, Educação e Ciências Humanas**, v. 15, 2014.

⁵ BRANDÃO, Gustavo Krysnamurthy Linhares. Horta escolar como espaço didático para a educação em ciências. 2012.