PROJECT PROPOSAL
THERAPEUTIC HORTICULTURE IN SCHOOLS

Cultivating Mental Health with Edible, Medicinal, and Ornamental Plants

Elbânia Pereira de Cerqueira Medeiros
Educator and Educational Administrative Assistant, State of Pernambuco

Recife, August 2025

PRESENTATION

I have worked as an Educational Administrative Assistant for the State of Pernambuco for 15 years and graduated in Pedagogy 8 years ago. I have also volunteered as an educator, serving as a coordinator and teacher for children and adolescents in need, many of whom faced different challenges such as being overage for their grade level, Attention Deficit Hyperactivity Disorder (ADHD), mild intellectual disability, and unstable family environments, among others. Through a project I created and implemented in my hometown of Gravatá, I sought to support these students with their schoolwork during after-school hours, since none of them had anyone at home to guide them in their studies for various reasons.

Observing the growing number of students in the State Education Network at the school where I work who are struggling with psychological and psychiatric issues, I developed the Therapeutic Horticulture Project. The goal of this project is to foster emotional intelligence, improve quality of life, and enhance academic performance for these adolescents through direct contact with nature, especially in this year when the theme of the Pernambuco State Department of Education is "Lives, Schools, and Community: educating for the promotion of socio-environmental justice."

As stated by the Ministry of Health and the Ministry of Education in their Environmental Health Handbook (Caderno Saúde Ambiental): "*Health promotion actions must be carried out through strengthened community involvement within the school, enhancing autonomy, enabling the exchange of knowledge, and encouraging technical and political empowerment between schools and communities. This means setting priorities, strategies, and monitoring tools for actions to be developed together."* To put this into practice, we will rely primarily on the Educational Proposal to Support Sustainable Development (PEADS), which "*promotes the development of various skills through awareness activities, research, follow-ups, and interventions capable of transforming existing realities, while encouraging autonomy and social protagonism*."

As an initial step, this pilot project could be implemented in a state school in Gravatá, ideally one with ample unused land. As a suggestion, the Professor Antônio Farias State High School of Reference. Depending on the results of this work, it could then be replicated in other schools.

"Education cannot be limited to training or mere information. It must be rethought and made to serve life, as well as human, social, and environmental fulfillment."
— Dulce Sampaio

1. PROJECT TITLE AND AUTHORSHIP

Therapeutic Horticulture in Schools
Cultivating Mental Health with Edible, Medicinal, and Ornamental Plants

Elbânia Pereira de Cerqueira Medeiros

---

2. OBJECTIVES

2.1 General Objective

To implement a therapeutic garden with edible, ornamental, and medicinal plants in the school environment, with support from the Department of Education and partner institutions, to complement the care of students with mild to moderate physical and mental disorders. The goal is to improve their physical, mental, and emotional health, thereby enhancing quality of life and academic performance.

2.2 Specific Objectives

- Provide students with opportunities to connect with nature as a form of holistic care.
- Encourage the use of edible, medicinal, ornamental, and endangered plants as tools for care, autonomy, and relaxation.
- Develop integrated practices of environmental education and mental health.
- Use the edible produce harvested to complement school meals.
- Raise awareness about environmental conservation and restoration.

---

3. COMMUNITIES INVOLVED, DURATION, AND SCOPE

In the first year, the project will be implemented with high school students at a state public school with available unused land (pilot school). Beginning in the second year, students from this school will be encouraged to share the knowledge they acquire with their families and communities; at the same time, replication will begin in other state schools within the same municipality. In the third year, the project will expand to state schools in other cities. In the fourth year, we will share our experience with interested municipal schools. In the fifth year, we will continue these activities, conclude this stage by analyzing the achievements and challenges—based on reports produced over the five years—and then develop a new project to carry this work into a second phase.

---

4. JUSTIFICATION

The growing prevalence of disorders among adolescents, such as Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), depression, and anxiety, among others, requires complementary therapeutic approaches. Contact with nature, especially through gardening, has proven effective in reducing symptoms of

mental health disorders, improving stress management, mood, and self-esteem, all of which are essential for more effective learning. This project proposes the creation of a garden with edible plants, ornamental plants, medicinal herbs, and endangered species, serving as a therapeutic and educational space for high school students. While designed primarily for those diagnosed with mental health disorders, it will not be limited to them. The initiative aims to promote socialization, psychological and social well-being, and contribute to a more inclusive and effective education.

---

5. ACTIVITIES

a) Planning and Training

- Meeting at the school with the management team, teaching staff, and the Specialized Educational Assistance (AEE) team to present the project and request their engagement in its practical aspects.
- Monthly meetings with the project team (coordination, psychologist, herbal therapist, and farmer) to present and evaluate project progress.
- Meeting with the agronomist and school management to agree on project needs and the area for implementation.
- Meeting with the school community (parents, guardians, teachers, and other members) to present and implement the project, as well as to identify participating students.
- Inviting students recommended by parents and teachers to join the project.
- Encouraging the involvement of teachers whose subjects can contribute to the project, such as biology, chemistry, physics, sociology, mathematics, geography, arts, and others.
- Seeking partnerships with universities, colleges, state and municipal departments, NGOs, and other institutions.

b) Garden Implementation

- Active participation of the students involved.
- Hiring or assigning a farmer to teach and assist in establishing and maintaining the garden when students are not present.
- Measuring and selecting the plot of land.
- Building planting beds with bricks or other recycled materials.
- Preparing the soil with compost, biofertilizers, and other natural fertilizers.
- Installing an irrigation system, whenever possible reusing water from air conditioners and rainwater.
- Using recycled materials whenever possible.

c) Cultivation and Maintenance

- Active participation of the students involved.
- Planting seedlings or seeds of edible, medicinal, and ornamental plants.
- Creating educational labels for each species (scientific name, common name).
- Using natural pest control methods (crop rotation, creating an environment that encourages natural predators, etc.).
- Manual irrigation.
- Ensuring proper hygiene of the produce and safe handling of tools.

d) Therapeutic Use

- Active participation of the students involved.
- Regular sessions with a psychologist and a herbal therapist, supported by the AEE team.
- Activities involving direct handling of plants.
- Reflection moments and recording of sensations (therapeutic journal).

e) Replication

- Producing booklets and educational materials for students and the wider community on the importance of healthy eating, the use of medicinal plants, and how to replicate gardens in their homes and communities.
- Publicizing the project in state schools in Gravatá.
- Selecting schools interested in participating.
- Meeting with the management teams of the selected schools.
- Training those responsible for implementing the project in these schools.
- Supervising and monitoring implementation.
- Extending the same process to municipal schools.
- Training and supporting students interested in replicating this initiative with their families and communities.

---

6. TIMELINE

Activities	Timeframe
Planning and Training	First month
Garden Implementation	Second and third months
Cultivation and Maintenance	From the fourth month until the end of the project (1 year)
Therapeutic Use	Throughout the project
Replication	From the second year on

---

7. SUCCESS INDICATORS AND EXPECTED RESULTS

- Self-reported reduction of physical and mental disorder symptoms (DASS-21 scale).
- Improvement in physical and mental health as reported by parents, teachers, and professionals involved.
- Increase in school attendance and academic performance among participants.
- Increase in overall social interactions.
- Active participation in project activities.
- Growth in the production of edible, medicinal, ornamental, and endangered plants.
- Students recognized by the community as active and engaged citizens.

---

8. SUGGESTED PARTNERSHIPS

- Municipal and State Departments of Health, Public Works, and Environment.
- Pilot state public high school.
- *Instituto Terra Viva do Brasil*.
- *Instituto Abdalaziz de Moura*.
- Universities and colleges.
- NGOs focused on mental health and organic agriculture.
- Companies (for example: agricultural supply stores).
- Others as appropriate.

9. BUDGET (Garden with 500 m² and approximate perimeter of 90 m)

Construction costs – USD 7872,08

- Fence and Greenhouse – USD 1032,14
- Irrigation – USD 4454,13
- Landscaping – USD 1462,94
- Common Leisure Area – USD 922,50

Human Resources – USD 7740,38

- Specialized Services – USD 1558,97
- Maintenance Services – USD 6181,41

Administrative Costs – USD 1034,53

- Materials – USD 372,31
- Graphic Services – USD 662,22

Other expenses – USD 1664,55

Grand Total – USD 18311,54

10. CONTINUITY PERSPECTIVE

The perspective for continuity of the project is high. Based on the study that will be conducted at the conclusion of the first stage—where challenges and successes will be documented—we will improve what worked and avoid repeating the same mistakes. This way, the project will flow more smoothly and effectively, reaching new schools, communities, and institutions, supported by dissemination through multiple channels.

11. SCIENTIFIC FOUNDATION

The implementation of school gardens with therapeutic, nutritional, educational, and environmental purposes is widely recommended by organizations such as the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), and by Brazilian public policies such as the School Health Program (PSE). In the educational context, this practice has shown significant positive impacts on the physical and mental health of students, especially those living with metabolic and neuropsychiatric disorders, and consequently on their social relationships and learning.

11.1 Regulation of the Nervous System and Stress Reduction

Contact with soil and plants activates the parasympathetic nervous system, which is responsible for feelings of calm and relaxation. Soil microbiota—particularly bacteria such as *Mycobacterium vaccae*—has demonstrated natural antidepressant potential by stimulating serotonin release, as shown by Lowry et al. (2007) in the study *"Identification of an immune-responsive mesolimbocortical serotonergic system"* (*Neuroscience*).

In addition, gardening practices increase dopamine and oxytocin levels, promoting well-being and reducing anxiety (Soga, Gaston & Yamaura, 2017 – *Preventive Medicine Reports*).

11.2 Improved Attention, Memory, and Executive Functions

Therapeutic horticulture is a recognized intervention for children and adolescents with ADHD and ASD. Activities with plants encourage focus and reduce disruptive behavior through structured, repetitive, and multisensory tasks. Studies such as Taylor & Kuo (2009) indicate that contact with green environments significantly improves sustained attention in children with ADHD (*Landscape and Urban Planning*).

11.3 Promotion of Healthy Eating and Metabolic Control

Incorporating unconventional edible plants, vegetables, and fruits in school gardens encourages students to try new foods and reduces consumption of ultra-processed products. This is particularly beneficial for students with obesity, hypertension, and type 2 diabetes, as it promotes participatory and hands-on nutritional education.

According to a study published in *Public Health Nutrition* (2013), school garden programs result in increased vegetable consumption and improved clinical markers in overweight children.

11.4 Reduction of Depressive and Anxiety Symptoms

For adolescents with depression and anxiety, gardening functions as a form of occupational therapy and mindfulness practice, restoring a sense of belonging, autonomy, and hope. Activities such as sowing, harvesting, and tending plants serve as symbolic metaphors of transformation, regeneration, and resilience.

Psychologist Ulrika Stigsdotter from the University of Copenhagen demonstrated that environments with dense vegetation and botanical diversity are associated with reduced cortisol levels and enhanced mood (*Urban Forestry & Urban Greening*, 2010).

11.5 Social Integration and Emotional Development

Collective work in the garden fosters inclusion of students with physical, intellectual, or social disabilities, strengthening bonds, empathy, and social skills. Studies on social therapeutic horticulture show that plant cultivation increases self-esteem, sense of purpose, and emotional expression.

For adolescents with autism, plant handling facilitates non-verbal interactions and strengthens sensory and motor skills, as shown by Dettweiler et al. (2017) in *"Green classroom: Outdoor education improves learning motivation and self-esteem"* (*Journal of Science Education and Technology*).

11.6 Reinforcement of Cross-Curricular and Meaningful Learning

The garden environment promotes active and interdisciplinary learning (biology, mathematics, geography, chemistry, arts, physics, among others). The pedagogy of Paulo Freire and constructivist approaches advocate for educational practices integrated into everyday life, where knowledge emerges from the relationship with nature and the community.

The bodily and sensory experience of cultivation makes learning more memorable and emotionally anchored, as demonstrated by research such as David Sobel (1996) in *"Beyond Ecophobia"* and Capra & Luisi (2014) in *"The Systems View of Life"*.

12. MAIN SCIENTIFIC AND EDUCATIONAL REFERENCES

1. **Brazilian Ministry of Health and Ministry of Education. (2022).** *Environmental Health – Thematic Report of the School Health Progra (*Saúde Ambiental **-** Caderno Temático do Programa Saúde na Escola).
2. **Lowry et al. (2007) –** *Neuroscience*, regarding *Mycobacterium vaccae* and serotonina.
3. **Taylor & Kuo (2009) –** *Landscape and Urban Planning*, regarding ADHD and nature.
4. **Soga et al. (2017) –** *Preventive Medicine Reports*, review on gardening and mental health.
5. **Stigsdotter & Grahn (2010) –** *Urban Forestry & Urban Greening*.
6. **Dettweiler et al. (2017) –** *Journal of Science Education and Technology*.
7. **Capra, F. & Luisi, P. (2014) –** *The Systems View of Life: A Unifying Vision*.
8. **Sobel, D. (1996) –** *Beyond Ecophobia: Reclaiming the Heart in Nature Education*.
9. **FAO/OMS (2014) –** *Agricultural biodiversity, nutrition and health*.
10. **Brazilian Ministry of Health.** *Environmental Education and School Health Reports* (*Cadernos de Educação Ambiental e Saúde na Escola*).