MedCrave
Step into the World of Research
International Journal of Avian & Wildlife Biology

Opinion
Open Access
CrossMark

Climate change and food security in cuba: considerations for the current educational context

Volume 10 Issue 2 - 2026

Dr C. Franciss Brown Smith
Enrique José Varona Pedagogical University, Cuba

Correspondence: Dr C. Franciss Brown Smith, Enrique José Varona Pedagogical University, Cuba

Received: July 28, 2026 | **Published:** September 7, 2026

Introduction

The crises affecting food, the environment, and agricultural production have taken on special significance, highlighting the need for changes in how humans behave—ethically, technically, and economically—within today's society. It is essential to join forces to promote the rational use of natural resources based on fairer, more equitable development models that support the Sustainable Development Goals of the 2030 Agenda—specifically SDG 4 (quality education for all), SDG 2 (Zero Hunger), and SDG 15 (Life on Land). Cuba currently faces severe economic and ecological challenges that threaten its arable land and, consequently, jeopardize food production.

In this same vein, climate vulnerability on the island is recognized as a threat to food production and food sustainability. Cuba's climate is characterized by an increase in prolonged droughts and intense rainfall during the rainy season, as well as the occurrence of extreme weather events—specifically hurricanes of increasing severity—that wash away and devastate arable land, alongside rising sea levels that cause saltwater intrusion into coastal agricultural aquifers. A report consulted for the National Program for Setting Land Degradation Neutrality Targets (CITMA, 2020) addresses the state of land degradation in Cuba, highlighting that 35% of the land is degraded due to the deterioration of soil physical, chemical, and biological properties and insufficient vegetation cover—issues linked to poor agricultural practices and climate change.

As part of Cuba's strategy to address climate change, a state plan known as Tarea Vida (Life Task) was implemented in 2017. It comprises 11 tasks; the first focuses on identifying and undertaking actions that contribute to food security—specifically five actions, one of which (Task 4) aims, among other things, to "diversify crops, improve soil conditions, and introduce and develop varieties resistant to the new temperature scenario" (Tarea Vida, 2017).

The education system is not immune to these issues and joins the call made by international organizations such as the United Nations (UN). This organization promotes sustainable development through 17 goals and 169 targets that serve as a roadmap for achieving true sustainability; of particular note is Goal 4, Target 7, which highlights the need to: that all learners acquire the theoretical and practical knowledge needed to promote sustainable development through education for sustainable development and sustainable lifestyles, human rights, gender equality, the promotion of a culture of peace and non-violence, global citizenship, and the appreciation of cultural diversity and of culture's contribution to sustainable development (UN, 2015); also highlighted is the ten-year strategy of the United Nations Convention to Combat Desertification (UNCCD), which underscores the importance of science and public awareness for developing sustainable management practices—including sustainable agriculture—and supporting the preservation of agrobiodiversity (WOCAT, 2009).

The education system in Cuba cannot be limited to teaching the content of various disciplines and subjects; rather, as part of a comprehensive general education, it must address and promote understanding of the issues hindering the country's food sustainability.

Agro-Environmental Education in Cuba

Along these same lines, Cuba recognizes the importance of environmental education as an essential process for achieving sustainable development goals—a context in which agricultural content is of vital importance, giving rise to the concept of agro-environmental education, defined by Brown (2021, p. 4) as: Process of designing and implementing educational activities aimed at the transmission and acquisition of knowledge, skills, attitudes, and values regarding issues related to the school agricultural ecosystem and environmental education oriented toward sustainable development.

The aforementioned author (Brown, 2021–2022) highlights agro-environmental education for fostering solutions to issues related to food production and the conservation of school agricultural ecosystems and the school environment, through agro-environmental activities that contribute significantly to the 2030 Agenda SDGs.

This agro-environmental education aligns with Cuba's Law 148 of 2022 on Food Sovereignty and Food and Nutritional Security, which is based on the National Plan for Food Sovereignty and Food and Nutritional Security (Plan SSAN, 2020) and emphasizes domestic food production.

Likewise, the educational component of agro-environmental education is highly significant, particularly when considering the cultural heritage that defines Cuban pedagogy. This pedagogy—which forms the conceptual and methodological foundation of environmental education in Cuba—is grounded in international experience and practice, as well as a long-standing tradition of implementation and development. It fosters values such as love for the land and an appreciation for rural life, while also reviving ancestral traditions among the Cuban people—specifically involving teachers, students, support staff, and the wider community.

School Agricultural Ecosystems and Sustainable Agricultural Practices

Agro-environmental education is of vital importance and a matter of national security in Cuba today. To implement the aforementioned

agro-environmental practices, the educational system promotes the recovery and maintenance of school agricultural ecosystems—as defined by Brown (2021–2022)—through an educational process that guides the implementation of farming methods involving the cultivation of protein-rich plants, medicinal herbs, and short-cycle vegetables adapted to the local context and production setting; these activities also specifically contribute to meeting SDGs 2, 4, and 15 of the 2030 Agenda.

Another significant point to highlight is that school agricultural ecosystems—serving as educational settings—not only contribute to the holistic development of students and education professionals but also help meet the demand for certain foods in the school cafeteria, compensating for shortages caused by low local agricultural production. These shortages stem primarily from objective and subjective issues, such as a scarcity of fuel and other external inputs that hinder the proper and regular distribution of agricultural products. Furthermore, these school ecosystems enable members of the educational community to obtain agricultural produce for their own and their families' fresh consumption, providing a source of economic relief.

School agricultural ecosystems serve as spaces for educational processes that link theory with practice and where socio-productive projects involving agricultural innovation are implemented through agroecology—the science of studying agroecosystems. These projects enable the production of organic materials such as compost or bio-soil and the use of vermiculture techniques to obtain humus—products capable of replacing costlier and insufficient synthetic chemical fertilizers—while also utilizing local biopesticides, prioritizing manual labor and traditional animal traction over fossil-fuel-dependent tractors, and conserving local plant genetic resources through the establishment of community seed banks.

Conclusion

In general terms, the agro-environmental approach focuses on developing agroecological, low-input agriculture that does not require significant financial or material investments—such as chemical fertilizers, fuels, and pesticides for disease and pest control. This form of education is grounded in the natural balance of plants interacting within the school's agricultural ecosystem and promotes biological processes—such as allelopathy—that occur in plants. Agro-environmental education represents both an opportunity and a source of hope in Cuba today, a time when climate change is significantly affecting agricultural ecosystems in local communities. Preparing teachers and students to face agro-environmental challenges is essential. Food production and the conservation of agricultural ecosystems are fundamental to achieving food sustainability and fostering environmental responsibility, an appreciation for rural traditions, and a commitment to the agro-environmental productive activities that are crucial to the country's socioeconomic and political life.

Acknowledgements

None

Competing interests

Authors have declared that no competing interests exist.

Citation: Smith CFB.Climate change and food security in cuba: considerations for the current educational context. *Int J Avian & Wildlife Biol.* 2026;10(2):48–49. DOI: 10.15406/ijawb.2026.10.00253