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Cuban Motivations for Sustainability: A historical and environmental case study of permaculture in Eastern Cuba in the face of climate change impacts

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Introduction

Patria o muerte, venceremos—homeland or death, we shall overcome. This is the fierce Cuban motto that led the country through a complex political and environmental history and has transformed Cuba into a world leader of sustainability. In this essay I outline why permaculture is an attractive agricultural solution for a population who has suffered generations of scarcity imposed by U.S imperialism through economic sanctions. Rooted in their motto of resilience, Cuba's widespread permaculture system strengthens communities and makes them less vulnerable to climate change impacts.

From March 2 to March 7, 2020, I attended a faculty-led study abroad trip in partnership with EcoThropic to Baracoa, Cuba. Conversations with EcoThropic Director Britt Basel, Humboldt National Park Scientist and Community Outreach Officer Porfilio Lopez, English Teacher and urban farmer Yayai, and a family that runs the permaculture garden of El Eden, informed my field research. The past informs the future; so I begin by explaining Cuban history and how events trickled into current permaculture practices in conjunction with climate change impacts.

Cuban history

Cuba's deep embedded need for self-sufficiency can be traced back to their bloody roots in the fight for independence from Spain and the United States. Cuba's long history of oppression from U.S involvement started with the Platt Amendment of 1901 that followed the three liberation wars Cuba fought against Spain (Chomsky, xiii). Nicknamed "Curse of the good neighbor," it mandated the U.S would have final say on what happened in Cuba in the socio-political and economic sphere (Basil, Britt. 4 March, 2020).

This, coupled with political corruption under Cuban president Fulgencio Batista, led to the Cuban Revolution in 1959 headed by Fidel Castro. The main goals of the revolution were to meet basic needs and close the wealth gap by creating free education and health care, provide housing and transform agricultural practices.

As a communist island nation, which is unfavorable in the U.S. political climate, Cuba has struggled from a lack of resources and has floundered to provide basic amenities to citizens for decades. During the Special Period in the 1990s, the country underwent a "triple blockade" after the fall of the Soviet Bloc, where a majority of their resources came from (Chomsky 131). Consequently, Cubans lost 30 percent of their body weight (Basil, Britt. 4 March, 2020). Further, the U.S economic embargo and an internal blockade to invent new economic solutions made citizens suffer. Since dollarization and loosened travel restrictions, Cuba's socioeconomic situation has improved, but the country still has many economic hardships (Chomsky 135). The

country is now facing increased difficulties with the hit of the coronavirus and continues to suffer under the U.S sanctions. The Cuban government provides its citizens with the basic necessities under a rationing system. But, because of political sanctions, there's no guarantee Cubans will be able to purchase necessary goods.

A worker in a construction materials site explained “The blockaide is making life in the pueblo really hard. After the U.S. civil war the U.S. started to take control of the global south, and tried to take Cuba, but it's not going to happen.”

His sentiments echoes what Cubans across the island have felt for generations since the start of the Special Period; the rationing system does not adequately provide sustenance, so they either leave or become reliant on food they can produce themselves.

In 1962, the Cuban rationing system was born out of ideas from the Revolution to redistribute the country's wealth and resources (Chomsky 41). It divided the population by ages: children under eight, eight to twelve, adults and elderly. In the 1980s, each family received a *canasta basica*—basic basket—that included one pound of meat per week. Lopez said the baskets often spilled over with an abundance of food, so much so that families couldn't consume all that was in the rations (Lopez, Porfilio. 5 March, 2020). Then, the Special Period came. What went from one pound of meat per week stretched to two pounds of meat per month (Lopez, Porfilio. 5 March, 2020).

Cuba's history of scarcity is precisely why Cubans like Yayai relies on her own agricultural production. Yayai makes preserves to last her family up to two years.

“Some people in the city wait for government subsidies, but if you have your own way to feed yourself it's better. It's something I'm trying to encourage people here in the neighborhood to do” (Yayai. 5 March, 2020).

The nexus of Cuba's history with natural disasters and political sanctions is the institutionalization of sustainability. Sustainability in Cuba is implemented at a governmental level. This is illustrated in agricultural reforms and investment in renewables. Given the sanctions on Cuba that exacerbated access to resources, sustainability was on the top of government official's lists. A 1992 Constitutional amendment incorporated new environmental concerns and held the government, citizens and all parties accountable for their actions (Chomsky 135). The amendment sparked three policy changes to implement environmental protection: “formal adoption of the 1992 Rio Summit principles on the environment, the establishment of a Ministry of Science, Technology and the Environment in 1994...and laws to implement new forms of environmental protection.” (Chomsky 135). This has been expanded in

a recent 2019 constitutional amendment that “Promotes the protection and conservation of the environment as well as responding to climate change, which threatens the survival of the human species” (Cuba Constitution. chapter II, article 16). The widespread permaculture system is important because it helps Cubans overcome the generational fear of not being able to feed themselves.

Permaculture practices

Rural and urban populations can become less vulnerable to the impacts of climate change through permaculture systems via biodiversity, and conscious design and planning.

Permaculture is primarily a systems design tool that operates through a circular use of resources and agroecology. El Eden, an exemplary zero waste permaculture garden I visited, used each crop and animal in multifunctions. For example, they used pig manure to create biofuel that was used to partially power the house, saving the family \$100 pesos a month (El Eden, 6 March, 2020). Permaculture design incorporates the use of the natural built environment and does not depend on chemicals to sustain the system—unlike conventional U.S agriculture that needs continuous modification (El Eden, 6 March, 2020).

Instead of a large agricultural system spanning hundreds of acres, Cuba’s agricultural system is concentrated in permaculture farms scattered across the Eastern part of the island. Agriculture looks at current production needs while permaculture looks at what's needed for wellbeing in the long run (Lopez, Porfilio. 7 March, 2020). Cubans prefer permaculture systems for it’s multi benefits; it is easy to replicate in any environment, produces copious amounts of food and saves energy and economic costs. For example, many Cuban families plant expensive crops so they don’t have to repeatedly buy them.

Impacts of climate change

This mentality of self-sufficiency is seen in rural and urban populations who are using permaculture systems to make themselves less vulnerable to climate change impacts.

In 2016, Hurricane Matthew decimated the town of Baracoa, which was later declared a disaster zone. It ricocheted in the mountains of Eastern Cuba for 12 hours. Wind knocked down trees, and rains washed debris in the rivers, causing massive erosion. Lopez said there wasn’t a single leaf on the trees, and the hurricane flattened the entire city and consumed land development. After Cuban’s entire land development was uprooted, many turned to permaculture for solutions to strengthen their agricultural practices. Systems design ensures that a biodiverse structure will help communities become less vulnerable to climate change impacts.

Biodiversity is the variety of life on earth (Matzek, Virginia. 2010, March. *Frontiers in Ecology and the Environment*, Vol. 8, No. 2, 59). Specific to permaculture, it is the variability of crops and animals to be used for multiple purposes. Biodiversity is valued in permaculture principles because if a climate change impact, like a hurricane, comes in and destroys all of one crop, others may remain. El Eden learned how to be more resilient to climate change impacts after they were decimated by Hurricane Matthew. The destruction exposed vulnerabilities in the system and they figured out how to rebuild. For example, where to put wind barriers in trees to lessen the impact on the system (El Eden, 6 March, 2020).

For some, starting over after the impacts was a blessing in disguise. Clara, a farmer in Eastern Cuba, strictly grew coconut trees before Hurricane Matthew hit. After, in addition to growing coconut trees, she learned how to preserve fruits and foods and is now working on educating others in need. Clara also focused on creating biodiversity of crops, incorporating mango crops, to avoid buying food she could produce herself. Rural populations did not feel the impacts of the hurricane as hard as people in urban areas because many farmers were prepared with preserves and knew how to feed themselves—which is a tenant of permaculture principles (Clara. 6 March, 2020).

Cuba is viewed as a model for sustainability and this is reflected in their abundant permaculture systems. The country is also the first in history to transform from conventional modern agriculture to large-scale organic and semi-organic farming (Rosset et al., 1994). In addition, the government converted sugar cane plantations to other crops and encouraged urban gardens on unused state land (Matzek et al., 2010). Elderly farmers were put to use again to teach college educated agronomists how to farm with oxen (Matzek 2010). The Cuban government also took the opportunity to be a world leader in green agriculture with virtually no means of purchasing pesticides, fertilizers, fuel and farm equipment (Chomsky 2016).

A sustainable future

Cuba can be a model for other developing countries who are also vulnerable to climate change impacts. Cuba's top-down approach to institutionalizing sustainability enables citizens to be more resilient to climate change impacts. If Cuba, an economically strapped country, can become resilient to climate change impacts, other developing countries vulnerable to climate impacts can as well.

Permaculture is important in developing Cuban communities that are resilient to climate change, as it gives them autonomy. Cubans have strived for independence since colonization and their natural environment has suffered from climate change impacts. A top-down approach to institutionalizing sustainability has enabled Cuba to be a world leader in green technology.

permaculture enables self-sufficiency and the ability to be resilient to climate change impacts through biodiverse systems and prepared populations.