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 Guatemala, 5: Climate Volatility

### Guatemala's Climate Crisis: How Spreading Agriculture into Schools Will Improve Resilience After Natural Disasters

The World Food Programme found that two-thirds of the population in Guatemala live on less than \$2 per day. Additionally, Guatemala is among the top 10 countries most vulnerable to natural disasters, and unfortunately, Guatemalan leadership has not found the best way to combat these problems (World Food Programme, 2022). This would lead one to question: What is the best way to improve resilience in Guatemalan communities after climate crises? An evaluation of the economic struggles of Guatemala, the challenges communities face after disasters, and governmental action, led to the solution to engage public schools in assisting local farms to increase the rate of resilience.

Guatemalan families rely heavily on resources gathered from their own agricultural efforts. According to the United States Agency for International Development, 41% of teenagers in Guatemala drop out of school since the education system lacks funding and educational quality. Thus, Guatemalans rely on their own forms of production since access to food can become very inconsistent. This is a consequence of trying to feed entire families, as the average family size is 4.8 people per household (Arcgis, 2022) and nutritious food can be sparse. The Global Nutrition Report shows that Guatemala falls far away from the target goals for dietary intake. For example, Guatemalans struggle to implement fruits, vegetables, nuts, and whole grains into their diet. These undernourished diets result in health epidemics throughout the country, including anemia, stunted growth, diabetes, troubles breastfeeding, and blood pressure concerns (Global Nutrition Report, 2023). On top of all these struggles, climate disasters make it even harder for citizens to maintain a nutritional diet.

Ricardo Hernandaz (2010) of the International Center for Tropical Agriculture explains that since the 1960's, farming families have relied heavily on their own farming for food security. He goes on to explain that when their farming is not successful, they turn to working on other farms for wage labor. On these large production farms, workers harvest coffee beans, sugar, cotton, fruits and other products. This work can be labor intensive and usually does not offer adequate working conditions (Hernandez, 2010, p. 10). This can be detrimental for some families because when they give up their own farms, they have to pay for their food rather than grow it. Nutritious food can cost around \$1.43 for one person according to Koen Voorend (2016), a professor of development studies at the University of Costa Rica and, again, many people live off of only 2 USD per day (World Food Programme). This results in many Guatemalans struggling to feed themselves, let alone their entire family. Furthermore, Voorend (2016) found that the agricultural sector usually only earns about 21% over the minimum wage and that, "most agricultural workers, including those in the coffee sector, are paid on a piece rate basis and earn less than the minimum wage" (p. 3). This, in turn, leads to famine and poverty all throughout Guatemalan communities. Hernandez (2010) emphasizes the importance of agriculture in Guatemala when he explains how agricultural products spur the job opportunities for rural nonfarm employees. For example, if there is a high production of watermelons in one area, there will be a need for more transportation for the goods (Hernandez, 2010, p. 10). Farming in Guatemala has a ripple effect on the economy and with recent climate impacts, the agriculture industry is impacted more than ever and is in dire need of a solution that creates a sustainable and successful economy.

Guatemala also faces many challenges when it comes to natural disasters. Andrew Selee (2020), President of the Migration Policy Institute, explains how uncertain rainfall patterns affect the morale of small scale coffee bean farmers. Thousands of families grow coffee beans as their source of income; however, abundant rainfall has caused families to fall into debt. Selee (2020) states, "... small producers

incur greater risk—and often debt—because of climate-related unpredictability”(p. 20). The scattered rainfall patterns cause the beans to grow coffee rust, a fungus that attacks coffee trees. Even though there is a fungicide that can protect the plants, many farmers cannot afford to use it because they are struggling financially since they are losing their main form of income (Selee, 2020, p. 23). Diago Pons (2021), climatologist at Colorado State University also points out Guatemalans’ need for resilience in his research. He found that torrential rain affects soil land, resulting in poorer production in maize and beans (Pons, 2021).) He also explains how disasters cause damages to infrastructure, such as bridges and roads, which can deter farmers from getting the supplies that they need to restore their farms. Pons (2021) more notably found that these setbacks tend to have heavy impacts on the morale of Guatemalans. This results in, “...several hundred thousand people have traveled North from this region since 2014” (Pons, 2021, p. 5). The northern migration of Guatemalans will eventually result in the decline of morale and could affect the productivity of family farmers who help their communities. This is why it is necessary to encourage the unity of the agricultural community.

The Guatemalan community is struggling, and their government is struggling to find ways to assist them. Juan Casado-Asensio (2021), public policy analyst working on climate change and biodiversity policy, shows how the government is attempting to improve resilience, but it has not successfully implemented laws and codes that have impacted the suffering sectors. He puts emphasis on the National Adaptation Plan that the government is trying to adopt and stresses the fact that their policies on certain sectors are still missing (Casado-Asensio, 2010). He expresses specific concerns for the policies which results in lacking support from Micro, Small and Medium Enterprises (MSMEs), which helps support employment in Latin American (Asensio, 2021, p. 14). Carrie Saey Fleming (2022), a researcher of social, environmental and health challenges of the rural poor with a geographic focus on Latin America, evaluates how the Guatemalan government actually holds the nation back from fully developing a resilient agricultural system. She explains that agronomists continue to argue with government lawmakers to allow GMO development within the country. Fleming quoted a man from the Indigenous Civil Society Organization. In his speech, he expresses concern about the government’s oppressive behavior and lack of concern for the health of its citizens. Fleming (2022) summarizes the people's view as, “ based on broader social-economic concerns and historical abuses of power exemplifies what others framed as “radical” or “idealistic,” rather than “technical” opposition to GMOs” (Fleming, 2022, p. 136). The control of the government is causing a blockage in progress for Guatemalan families; therefore, communities need to take action and create a plan to encourage progress.

The United Nations recognized the struggles in Guatemala and have taken initiative in order to find a solution for lacking sustainable development in Guatemala. One of their solutions to encourage resilience is to provide resources for Guatemala, in hopes to strengthen its communities. The World Food Programme states that, “Some 9,000 families in remote, disaster-prone areas, participate in food for assets initiatives, whereby they receive support in either food or cash in exchange for the building or rehabilitation of assets that will strengthen their resilience to climate shocks and stresses”(World Food Programme). However, since growth can only be achieved within the country itself, the Guatemalan government passed the School Nutrition Law in 2017. This law made it a requirement for schools to use 50% of locally sourced food in school lunches. Even though this program is costly for schools, communities praise it. The International Fund for Agricultural Development explains how the pilot program provides “healthy meals to more than 12,000 children in 60 schools across 20 municipalities”(2021). This new program not only solves the growth stunting epidemic in children but also helps local farmers generate a constant source of income. Community farmer of La Felicidad, Francisco Mejía, states how, ““We have the security of a confirmed order,...Sometimes prices drop in the market, but the prices for the school orders are fixed over a certain period of time. That allows us to plan our work and to anticipate our income”(2021). This program is revolutionary since Guatemala experiences such inconsistencies in agriculture, and it helps establish a sense of community and build morale, which is why they should take another step in building a resilient future in agriculture. This would

consist of involving students in agricultural production that is taking place in their communities. Involving students in agriculture will not only give them the skills they need to provide a hopeful future in agriculture, but it will also help farmers who provide food for their school. With the incorporation of both the programs, schools can take students to local farms to learn about what supports their community and how they can improve it in the future.

While this solution is the best course of action, there are some limitations. This includes finding governmental support and funding which can come from governmental aid, or organizations can support their own involvement. Additionally, school administration would need to arrange time for the programs' activities and classes; however, schools will see the need for change and the potential benefits that it brings. For example, other countries such as Vietnam have started educating their students on climate change and other environmental struggles. UNICEF and Clean Air Asia in Ho Chi Minh City created a workshop that encouraged students to find different solutions to air pollution (2019). Encouraging students to think innovatively is encouraging involvement in communities. UNICEF found that "Such capacity building support and education enables students to become agents of change in their communities". If Guatemala chooses to invest in younger generations, they will become responsive to disaster and offer new ideas.

Even though educating younger generations can show long term benefits, farmers are struggling and need new solutions now. Mathias Eistrup of the University of London's Department of Developmental Studies explains how Guatemala's government attempts to respond to farmers but can only offer help to a certain extent. Eistrup discusses how programs such as Directorate of Regional Coordination and Rural Extension (DICORER) provide technical assistance with farming including specific guidance regarding "soil conservation, livestock vaccination, crop conservation, pest management and making farmers grow vegetable gardens..."; however, small scale farmers tend to avoid taking the organization's advice. Eistrup states that "Given their precarious condition, these farmers are naturally risk averse and don't typically adopt new farming practices that could potentially deteriorate their already uncertain food security situation" (2018). In a country that faces extreme food insecurity, it is reasonable that farmers would not want to risk their food sources, so insurance should be introduced into the Guatemalan economy. This ensures financial comfort for farmers so they can introduce new farming techniques without the fear of food insecurity. The World Bank (WB) and the United Nations World Food Programme (WFP) created the Disaster Risk Insurance and Finance in Central America Consortium (DRIFCA) in 2022 to help improve security for small scale farmers in order to open up new research opportunities (2022). If more insurance options such as the DRIFCA are provided, more farmers will embrace research that has long term benefits for future farming generations.

After evaluating Guatemala's economic status, community reaction when faced with adversity, and governmental action when it comes to natural disasters, it is clear that the people of Guatemala need a solution to improve their livelihood and health. One long term solution stems from the implementation of organizations in public schools that help guide the future of agriculture in a direction that creates a sustainable way of living along with the allowance for nutritious food to be accessible. Additionally, the Guatemalan government can create insurance programs that allow small scale farmers to use experimental technology that can combat climate crisis. In recent years, the GDP from agriculture has steeply declined. In 2000, the agricultural sector contributed to 22.8% of Guatemala's GDP, but in 2021, the sector only contributed to 9.4% of the GDP (The World Bank, 2021). This decline is a direct result of climate change effects such as hurricanes and extreme droughts, according to Kayly Ober, a senior program officer for the climate, environment and conflict program of the United States Institute of Peace, so Guatemala's agriculture system needs support in order to build the farming community's strength and resilience against natural disaster. Innovative programs are the only way that the future of agriculture in Guatemala will be protected.

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