

Frances Jackson  
Green Mountain Garwin Schools  
Garwin, Iowa  
Haiti, Sustainable Agriculture

### **Creating a Sustainable Food Source: Crickets in Haiti**

Have you ever had to worry about where your next meal is coming from? Probably not, but while you read this paper try to imagine what living with that feeling every day is like. This is the daily reality for most citizens who reside within the country of Haiti. Centuries of ineffective and corrupt governance, along with rugged terrain and multiple natural disasters have left Haitians in need of assistance to create a sustainable future for its citizens. Haitians need a sustainable food source that can easily, inexpensively, and quickly be integrated into their diets. Entomophagy offers a potentially long-lasting solution for every person who is currently experiencing hunger in Haiti. Specifically, cricket farming would provide a substantial protein source, a practical way for Haitians to help themselves, and the potential for an economic boost for the country.

The country of Haiti is located in the Caribbean Sea, southeast of the Florida Peninsula. Haiti is made up of 10,714 square miles and 66% of this land is cultivated. It is made up of a portion of the island Hispaniola; the Dominican Republic occupies the other half of the island. Haiti also contains several smaller neighboring islands, but the capital, Port-au-Prince, is located on Hispaniola. According to Culturegrams, Haiti's current population is just over eleven million people.

Haiti is a very mountainous country, with several large rivers dividing it. Roughly half the population lives in rural areas, which are often plains located in the hills and valleys of the mountains. Haiti's climate is tropical with average temperatures of between sixty and eighty degrees Fahrenheit and an average rainfall of fifty-four inches annually. Haiti has dry winters and summers and rainy autumns and springs. Hurricane season is from mid-June through November.

Haitians living in rural and urban environments tend to have different lifestyles. In rural Haiti, families sometimes consist of more than five children; whereas, in urban areas families have two to three children. In Haiti both men and women work; often men raise crops and women raise produce and perform other tasks. Haitians cook food over coals and in fires, they also often fry it in pig fat. Women are generally responsible for raising the children and handling family finances. Single-parent homes are common as well, however, women don't often hold powerful roles in large businesses and the government. It is also common for Haitian women to face domestic violence. Rural Haitians often live in lakous, which contain small rooms for sleeping and a courtyard which is usually shared between families. Many urban houses are made from bricks, cinder blocks, or other easily accessible materials.

The occupations of many Haitians are farm-related, like farmers and farm laborers. Haitians often live on less than a dollar a day. Their minimum wage is 440 Haitian Gourdes per eight hours, equivalent to 5.50 USD per day. Haiti is made up almost entirely of small farms with large farms composing less than three percent of total farms. The average farm size in Haiti is only 2.5 acres while in the U.S. the average farm size is 444 acres. Unfortunately, deforestation has created poor soil quality and led to erosion. The main crops of Haiti are coffee, mangoes, and cacao. The clothing industry has become important to Haiti's economy in recent years and makes up ninety percent of Haiti's exports.

Education is required for children between the ages of six and twelve, however, there aren't many schools available to children and only a small percentage of children attend school. It is quite common for Haitian children to end their schooling after they complete primary school.

The people of Haiti often speak the language Creole in daily life and some speak French. Only about ten percent of the population know how to write in French. This creates an additional educational barrier because schools in Haiti often don't accept written Creole, only French.

Haiti's roads are also not of very high quality. They have many deep potholes, some roads become impassable when it rains a lot and when the climate has sudden changes. Other infrastructure problems have been caused by devastating hurricanes and an earthquake that measured 7.0 on the Richter scale in January of 2010. Haiti's capital Port-au-Prince sits on the edge of two major fault lines: the Enriquillo-Plantain Garden fault and the Septentrional fault. Earthquakes in Haiti were recorded by a French historian as early as the 1750s. Because Haiti is so impoverished it doesn't have the resources to rebuild buildings and infrastructure that can withstand these natural disasters.

Haiti's government can be defined in several ways: as a republic, a unitary state, or as a semi-presidential system. The semi-presidential system exists because a president is elected to a five-year term. However, the president also appoints a prime minister from their bicameral parliament. Although from the outside the government in Haiti appears seamless, it also provides challenges for the citizens. One challenge is although everyone has had the right to vote since the year 1950, their elections are often tampered with and corrupt. This results in leaders that aren't correctly representing the general population.

One reason Haitian's government is weak is because one of their former presidents, Jean-Pierre Boyer agreed to pay France 150 million francs in repayment to former slave owners in the early 1800s; he also did this so France, their former rulers would recognize Haiti as a country. Haiti still feels the repercussions of this decision. Haiti has also had a coup and several changes of power and leadership styles in the past two hundred years. This made stability hard for Haiti to achieve. For the majority of the twentieth century, they were ruled by military powers until Jean-Bertrand Aristide was elected president. Impatience for results from Aristide led to violence and unrest in Haiti. After a military coup, the United States stepped in to help Haiti overcome the unrest.

One of Haiti's main problems is hunger. This problem is getting worse and affects everyone because of their low incomes, poor infrastructure, and natural disasters. According to The World Bank, Haiti is the Western Hemisphere's most impoverished country, with over six million Haitians living below the poverty line. In poor countries like Haiti, they often don't have the correct infrastructure, living conditions, and government program foundations that can create success and improve the lives of citizens. "They [Haitians] have to import 50% of their food products" (Pfieffer). This leads to Haitians being less successful and having a lower life expectancy all because of their place of birth. It is tragic that through no fault of their own, Haitians are condemned to a life of poverty and hunger.

Many of Haiti's citizens struggle with getting the appropriate nutrients into their bodies. They also struggle with reaching and maintaining an appropriate body weight. One nutrient that could be increased in Haitians' diets is protein. Protein is a macronutrient that helps to build the body's cells and tissues, in addition to repairing the existing tissue. Protein also is important for immune system responses, blood clotting and other vital body activities. Adding protein to the diets of Haitians would help decrease the amount of chronically malnourished people.

Another reason Haiti is struggling is the quality of the food citizens consume. Because many citizens are so poor they lack the funding to be able to purchase food, let alone high-quality food. Oftentimes, instead, they have to create their food with limited resources.

"Well, it's not exactly ideal, but sadly, the people of Haiti have no real alternative. With food scarce and prices high, many Haitians are forced to create their food from mud, with butter and salt added to make the snack comparatively palatable. In some cases, sugar may be applied, if it's available. As you can imagine, these 'dirt cookies' have virtually no nutritional value" (Porter).

The lack of nutritional value in their food also depletes their immune systems and leaves them at higher risk for contracting diseases and these diseases becoming serious or even life-threatening.

Recently in Haiti prices have been drastically rising, sometimes by a fifty percent price increase per year. This has led to families not being able to purchase enough rice for even one serving a day. Instead many poor families are making or buying dirt “cookies” for five cents a day. “Marie Noel, 40, sells the cookies in a market to provide for her seven children. Her family also eats them. ‘I’m hoping one day I’ll have enough food to eat, so I can stop eating these,’ she said. “I know it’s not good for me” (Cubillos). The people in Haiti can either starve or eat these unhealthy, unpalatable cookies.

Something the United States and other prosperous countries could provide Haitians with is crickets. Yes, these pesky, noisy creatures can be very valuable. They are a great source of protein, which Haitians need, and can easily be added to any diet, are easy to care for, and have few land impacts. According to Forbes.com, “expanding meat consumption is expensive and can have damaging environmental consequences.” The article goes on to say that “an increased consumption of insect proteins as a more sustainable alternative” (Knapp). In addition, a normal food source such as beef or chicken only contains between twenty and thirty percent protein while crickets and other insects contain roughly sixty-five percent protein.

Haiti’s cuisine style is influenced by a variety of different countries because they were under control of a variety of different countries throughout history. Countries that influenced their cuisine include the United States, Spain and Spanish-speaking countries, France, and the continent of Africa. Several of these countries such as Mexico, portions of the United States, and the continent of Africa practice entomophagy. Because these countries have influenced Haiti’s style of food, Haiti could also follow them in the introduction of eating insects, such as the cricket.

In addition, Haitians should be more open to new food options. This can be inferred because of the price increases and the struggle to find and purchase food to feed their families. Many Haitians are eating dirt, not by choice, but by necessity. Bugs could replace the dirt and mud in their daily diet. “However, more people have begun to accept cricket consumption in Europe, the United States, and Canada as food companies have created user-friendly cricket-based products like protein powders and protein bars (Kubala). If Haitians were to see countries such as the United States and Canada eating crickets, they would be more inclined to do so as well.

Haitians’ religion could also play a role in encouraging them to eat crickets. Eighty-four percent of Haitians are Christian. Of the sixteen percent remaining, two percent practice Vodou, four percent other, and ten percent are non-practicing. Vodou is a religion that combines the West African Vodun religion and Roman Catholicism. John the Baptist, an important figure in Christianity was widely known to have eaten bugs, such as locusts. This could play a role in eliminating the stigma around entomophagy, and religiously influence Haitians to eat crickets, just like John the Baptist did.

The lifespan of a cricket is roughly ninety days, also creating an advantage for using crickets as a protein source. This is a benefit to the people of Haiti because the crickets are ready to be harvested quickly. Beef takes roughly two years to finish. Pork takes six months to a year to be ready for harvest, making crickets one of the fastest animals ready for consumption. Haitian’s don’t even have to wait three months to harvest the crickets because crickets can be consumed anytime after a month of age. This fast turnaround will help decrease Haiti’s hunger problem.

How does cricket farming work? Well, it is pretty simple and an added bonus is that crickets are ready for harvest within two months. They can also be grown wherever plastic storage containers can fit. To start,

Haitians should be supplied with two hundred two-week-old crickets and a few plastic bins with small pin-sized holes in the top of the containers to keep them alive. There should be roughly four containers given per two hundred crickets for cricket housing purposes. These containers need a moisture-absorbent material for the crickets to walk and live on. Cardboard and milk cartons can also be used in the bottom, crickets will crawl around and live on these types of materials as well.

The crickets should be divided between two of the containers as their new habitats. The other two should be used later for newly hatched crickets to live in. Crickets can start laying their eggs between eight and ten days old, but won't when they are stressed. To collect the cricket eggs, place them in two smaller containers with damp sand. Within roughly a week, the smaller containers should be full of eggs and can be placed into new containers to begin a new colony. Crickets can be fed fruit and vegetable scraps and they will also eat grass and other forms of vegetation. These plastic housing containers should be cleaned once monthly.

To harvest the crickets they can be frozen or a new lid with no holes can be placed on top. Within a few days, the crickets should be dead. They should then be laid out to dry out, they can also be placed in an oven or near a fire to dry out. After they are dried out, they can be eaten similarly to popcorn or ground into a fine powder and mixed into meals. As mentioned earlier, the women of the families often work at home raising produce and performing tasks at home. The women of the home could also take on this task of raising and harvesting this cricket food source for the family.

Another reason that cricket farming would be a great addition to Haitian life is their climate. Haiti's climate is fairly tropical, with warm and tropical temperatures as the daily "norm". The average temperatures range between sixty and eighty degrees Fahrenheit. However, in the winter season at high elevations, there is occasionally frost. Not very many people live in the higher elevations so this wouldn't be a major concern for my cricket farming solution. The people who live in warmer climates could support a lot of crickets and sell them to the mountainous population creating additional revenue for a majority of the population.

Another benefit for families when they raise crickets is the additional revenue opportunity available. Families who start raising crickets can sell them to others who don't. They also can sell the ground powder from the crickets that people can mix into their food as well. In addition, the manure and residue from the bottom of the bins can be applied to farmland to add nutrients. The increase in nutrients will also increase the amount of produce that comes off of each acre. Eventually, this could decrease the prices of products including fresh produce, and increase the amount of quality food available for consumption.

This cricket project could be led by churches that see Haiti as fertile ground for mission work. Churches are always looking for projects they can fund to help the less fortunate and I believe my project would be the perfect option. It would require minimal starting investment and be sustainable quickly after it was started. Haitians could lead this project once funding was established and would offer the benefit of building self-reliance. I don't think many policies would need to be in place because Haitians are very generous people. The participants would have to be willing to keep their colony of crickets alive for the long term. Community members would have to split colonies once they increased in size. This wouldn't be very hard because of the containers in which the eggs are laid. The females also lay a lot of eggs so colony sizes could increase fast. Again, this makes this practice a sustainable option.

As you imagined hunger during the time it took to read this paper, I hope that you were able to grasp the magnitude of this issue. Hunger affects every aspect of your life, it eats away at your focus, lowers your immune system, and decreases productivity. For the American palette, it may seem unimaginable to add crickets to our diet regularly. However, if adding crickets could help solve some of the economic, health, and societal problems caused by hunger, the only question would be why not? Why not add high-quality,

low-cost sustainable protein to the diet of Haitians? The possible benefits far outweigh any perceived negative effects or stereotypes. Haitians literally eat dirt to allay the hunger pains. Eating insects should be encouraged and celebrated as a possibility of victory over hunger for the people of Haiti.

## Sources

- Avenue, Human Rights Watch | 350 Fifth, et al. "World Report 2020: Rights Trends in Haiti." Human Rights Watch, 13 Dec. 2019, [www.hrw.org/world-report/2020/country-chapters/haiti](http://www.hrw.org/world-report/2020/country-chapters/haiti).
- Cubillos, Ariana. "Haiti's Poor Resort to Eating Mud as Prices Rise." NBC News, 29 Jan. 2008, [www.nbcnews.com/id/wbna22902512](http://www.nbcnews.com/id/wbna22902512). Accessed 7 Aug. 2021.
- "Culture of Haiti - History, People, Clothing, Traditions, Women, Beliefs, Food, Customs, Family." Everyculture.com, 2000, [www.everyculture.com/Ge-It/Haiti.html](http://www.everyculture.com/Ge-It/Haiti.html). Accessed 5 Mar. 2021.
- "Food Facts: 7 Reasons to Eat Insects." Wwww.agclassroom.org, 2013, [www.agclassroom.org/matrix/resource/961/](http://www.agclassroom.org/matrix/resource/961/). Accessed 26 Mar. 2021.
- Girault, Christian Antoine, MacLeod, Murdo J., Ferguson, James A. and Lawless, Robert. "Haiti". Encyclopedia Britannica, 22 Jan. 2021, <https://www.britannica.com/place/Haiti>. Accessed 1 March 2021
- "Haiti: Education." CultureGrams Online Edition, ProQuest, 2021, [online.culturegrams.com/world/world\\_country\\_sections.php?cid=69&cn=Haiti&sname=Education&snid=21](http://online.culturegrams.com/world/world_country_sections.php?cid=69&cn=Haiti&sname=Education&snid=21). Accessed 30 March 2021.
- Knapp, Alex. "Farming the next Big Food Source: Crickets." Forbes, 30 Jan. 2018, [www.forbes.com/sites/alexknapp/2018/01/30/farming-the-next-big-food-source-crickets/?sh=99afc3611681](http://www.forbes.com/sites/alexknapp/2018/01/30/farming-the-next-big-food-source-crickets/?sh=99afc3611681). Accessed 15 Mar. 2021.
- Kripke The Chameleon & Friends. "How I Keep Crickets Alive & Cut Cost - a Must See | Gutloading Tips | Cricket Care for Beginners." Youtube, 4 Oct. 2019, How I Keep Crickets Alive & Cut Cost - A Must See | Gutloading Tips | Cricket Care For Beginners. Accessed 2 Mar. 2021.
- Kubala, Jillian. "Eating Crickets: Benefits and Downsides." Healthline, Healthline Media, 6 May 2021, [www.healthline.com/nutrition/eating-crickets#why-eat-them](http://www.healthline.com/nutrition/eating-crickets#why-eat-them).
- Lawless, Robert, MacLeod, Murdo J., Ferguson, James A. and Girault, Christian Antoine. "Haiti". Encyclopedia Britannica, 22 Jan. 2021, <https://www.britannica.com/place/Haiti>. Accessed 18 March 2021.
- "Overview." World Bank, 31 Dec. 2009, [www.worldbank.org/en/country/haiti/overview](http://www.worldbank.org/en/country/haiti/overview).
- Pfeiffer, Sydney. "Insect Diet in Haiti." Prezi.com, 23 Sept. 2018, [prezi.com/p/m927snylkd3k/insect-diet-in-haiti/](http://prezi.com/p/m927snylkd3k/insect-diet-in-haiti/). Accessed 26 Mar. 2021.
- Porter, Greg. "People in Haiti Are Forced to Eat 'Mud Cookies' to Survive." The Sized, The Sized, 30 Aug. 2019, [www.thesized.com/people-haiti-eat-mud-cookies-survive/](http://www.thesized.com/people-haiti-eat-mud-cookies-survive/).
- "Protein: Sources, Deficiency, and Requirements." Medical News Today, MediLexicon International, 10 Dec. 2020, [www.medicalnewstoday.com/articles/196279](http://www.medicalnewstoday.com/articles/196279).
- "Raising & Breeding Crickets." Cricket Care, [cricketcare.org/breeding/](http://cricketcare.org/breeding/). Accessed 15 Mar. 2021.
- The Critter Depot. "How to Breed & Raise Crickets - the Critter Depot." Wwww.youtube.com, Youtube, 1 July 2018, [www.youtube.com/watch?v=LrZW1WdxDos](http://www.youtube.com/watch?v=LrZW1WdxDos). Accessed 10 Mar. 2021.
- "The History of Natural Disasters in Haiti." UFondwa-USA, Inc., University of Fondwa, 22 Feb. 2018, [www.ufondwa.org/history-natural-disasters-haiti/](http://www.ufondwa.org/history-natural-disasters-haiti/).
- United States Department of State. HAITI 2018 INTERNATIONAL RELIGIOUS FREEDOM REPORT. , 2018.