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Honduras, Factor 6: Sustainable Agriculture

### **Honduras: New Techniques of Sustainable Agriculture for Rural Farmers**

Honduras, officially known as the Republic of Honduras (República de Honduras in Spanish), is geographically one of the larger developing countries in Central America. The country was and still is the home of multiple Mesoamerican cultures, including Mayan and Lenca (Cerámica Lenca or Lenca Pottery, n.d.). The city of Copán is an example of a preserved indigenous site for tourists. The indigenous peoples have strong ties to their culture in both urban and rural areas. Indigenous practices can still be seen in farming techniques, although these techniques are not always sustainable with the climate. Honduras is about 1568 kilometers (974 miles) north of the equator. Its proximity has caused a large part of Honduras to have little rainfall and be moderately arid. This geological dilemma causes rural farmers in Honduras to be somewhat unsuccessful with their crops. Honduras is also very mountainous causing difficulties traveling between rural and urban areas. Because of this, rural villages tend to be very isolated. Rural farmers rarely have access to materials or knowledge to improve their crop. There are many NGOs (non-government organizations) and non-profit organizations from the United States, and some as far away as Japan, who are helping farmers to have more sustainable plots in small villages. Techniques of sustainable agriculture such as crop rotation, the use of biochar, and better forms of irrigation are shown to improve their crops but the ideas are slow to reach these rural farms. Based on the poverty levels in rural areas, improvement of crops could improve the lives of many people throughout the country.

Honduras is one of the poorest countries in the world. According to Proyecto Mirador, “6 out of 10 of households are subject to extreme poverty of incomes of less than \$2.50 per day” (Poverty and Crime, n.d.). Even the United Nations acknowledges that more than 65% of Hondurans live in poverty and one fifth of the population is malnourished. According to Nidia Flores, the native Honduran representative of the non-profit organization Mayor Potencial, mid-sized families (2 or 3 children) in rural areas have diets which consist of beans and corn tortillas. Families who earn a little more money might enjoy local fruits, vegetables, and chicken in their diet. Most people only eat once or twice a day. At times, children will go to school without a meal and likely only eat once a day.

Schools in rural areas are often one or two classrooms in a very small building and only support grades Kindergarten through 6th. There are few high schools and are generally too far away for smaller villages to attend. The government issues and employs teachers, but only if there is a building for them to teach in and usually, there is not. According to the United Nations Universal Declaration of Human Rights, schools and education are basic human rights and a crucial part of Honduran villages that are often missing.

Another important feature many small villages lack is doctors. Most towns have a clinic which is only open a few days of the week and there is often only nurse. Childbirth usually takes place in the nearest city in a hospital, but in emergencies, there is usually a midwife in the village or in a village nearby. With

rural roads being unpaved and rugged, there is no easy way to travel to the city quickly. Usually, the only form of transportation is a crowded bus.

Conversations with native Hondurans reveal that the level of poverty in both urban and rural areas is severe. In an interview, Nidia Flores (the native Honduran representative of Mayor Potencial) explained that the average salary in the city is 7,400 Lempiras which is just under \$316. Government employees in the city have an annual income which ranges between 8,000 and 12,000 Lempiras (between \$341.50 and \$512.20) depending on their position and influence. The average salary for a government employee in rural areas is 6,000 Lempiras (about \$256). This includes teachers and the occasional doctor as they are employed by the government. In rural areas, people with permanent jobs can make between 100 and 3,000 Lempiras (about \$4.30 to \$128) per day but there are rarely permanent jobs in rural areas. Often, a person could spend an entire month looking for a job, only to be able to work 4 or 5 days in total. For a person to survive individually in rural areas, they would need to have an annual income of 12,000 Lempiras (\$512.20) but only if they had a house and were able to cultivate their own daily diet of corn, beans, and chicken. They would need to buy rice, sugar, and occasionally coffee. In order for a family of five people to survive in rural areas, they would need an average income of about 36,000 Lempiras (\$1536.60). The family would also need to have a house and need to be able to grow corn, beans, and chicken. They would buy rice, sugar, and soap. If either an individual or family was not able to cultivate a majority of their own food, they would not be able to survive on these annual incomes. Without a job, survival is difficult, if not impossible and all members of a family would need to bring some kind of income to the family. This is difficult because there are not many well-paying jobs for children or women.

Women in rural villages are disadvantaged in some major ways. The primary issue is the lack of education. Since many only have a 6th or 7th-grade education they rely on community and family to pass on the education they need to survive. They have no opportunity to learn about technology and are often relegated to homemaking or indigenous crafts. Small organizations, typically NGOs and nonprofits, are beginning to offer micro loans for rural families. These loans are greatly improving life for many families. Loans offer women a chance to create a business from their trade/craft knowledge. Loans can also help farmers to buy much-needed farm equipment to be more prosperous. For instance, farmers are able to buy pipes and pumps for irrigation, grinders for corn and beans and other equipment needed to raise chickens and grow successful crops to repay their loans. Women in cities are extremely disadvantaged as well. According to the Grameen Foundation on their Freedom from Hunger project, there is an extreme social separation between sexes as well as ethnicities and “indigenous and other ethnic groups and women are highly tenure-insecure” (Honduras, 2015). Without access to a high paying job, survival for women on their own in both urban and rural areas is extremely difficult.

Farmers in small, rural villages have extremely small plots which barely produce enough for the family - this is called subsistence farming. For sustenance, people grow corn, beans, rice and other vegetables like sweet potatoes and peppers. Some people also grow a wide variety of fruit and nut trees. These trees include mangoes, papayas, bananas, cashews, coconuts, oranges, and even coffee. Some farmers grow a vine crop called pastas as a cash crop. After being skinned and dried, the farmer can create a product we call “luffa” for use in bathing. They either create and sell this product themselves or they sell the raw materials to another farmer. Because many farms lack adequate irrigation, producing enough food and cash crops is difficult. Also, low amounts of nutrients in the soil causes plants to not be as prosperous as

they could be. Another difficulty is pest management. Farmers who use pesticides often do not know of or take safety precautions when spraying the chemicals. The pesticides do not outwardly affect the environment, but there may be long-term effects on both the environment and the people who live on the farm or consume the food treated with chemicals.

Farmers in Honduras have more to worry about than just having sustainable agriculture. One major problem in the country is pollution. Perhaps the problem begins with the fact that Honduras is a developing country and lacks the infrastructure to deal with its overall waste. The water used by rural towns is a major problem as well. In cities, drinking water is both accessible and of good quality, but in rural areas, the water is extremely polluted with *E. coli* and other bacteria. Lack of sanitation in water leads to poor health and even death.

Another major problem is deforestation. Logging and the clearing of land for agriculture are causing the land to degrade and the soil to erode (Deforestation in Honduras, n.d.). Due to climate change, Honduras is at risk of extreme weather changes. The country's position between the Atlantic and Pacific Oceans is partially the cause of climate change and has shown to affect Honduras in more extreme ways than in other countries. The effects are already being felt in Honduras. Devastating droughts and changes in weather hurt the crops of both small and large-scale farmers by reducing crop productivity, size, and can even wipe out an entire field. Climate change is one problem that Honduras cannot change by itself but, with the help of other countries, improvement can be made.

One widespread difficulty for farmers is access to and the use of water. There are few forms of irrigation used in rural villages but the most common form is flood irrigation. Water is siphoned, sometimes uphill, from rivers or springs to the fields and empties into a makeshift well. This is a very inefficient use of the precious resource because much of the water flows off the field or is lost in the transportation to the field. Farmers are now learning about the value of drip irrigation and how it can use far less water and keep their crops better hydrated. The drip irrigation systems can be installed quickly and easily using inexpensive and durable piping with small holes. Another water problem most people in rural towns are unaware of is *Escherichia coli* (*E. coli*) and the amount of *E. coli* in their drinking and irrigating water. A group of development sociology and plant breeding students from Cornell working with the organization Mayor Potencial traveled to the rural town of El Rodeito to test water for *E. coli* and take soil samples for nutrients (Get Involved, n.d.). The water test results showed that every commonly used water source in the rural town of El Rodeito was contaminated with *E. coli*. This is common in most towns that do not have access to filters. When they tested water that had been run through a clay filter from a contaminated source, there were no *E. coli*. Nidia Flores said in an interview that the people in El Rodeito consider the effects of *E. coli* to be a part of life and becoming the age when *E. coli* does not affect a child is a right of passage to become an adult. One way NGOs and other organizations could help ease the lives of rural Hondurans would be to build filtration systems either at the water source or in homes. The Cornell group also went to the village to give the farmers new techniques of sustainable agriculture which could help change many of the problems with crop productivity.

The Cornell students working with Mayor Potencial also shared new knowledge of sustainable agriculture techniques, such as crop rotation and the benefits of biochar along with the improved technology of drip irrigation. These techniques will allow farmers in El Rodeito and other small villages to be able to

improve their crop output. Farmers can begin the process of crop rotation by leaving one-tenth of their field fallow for one season. This will allow them to still produce a sustainable amount of their crop and let a part of the field rest. Some farmers have even begun growing beans in their fields for a season which enriches the soil with nitrogen for future years. Crop rotation will help the fields to be more prosperous in the future and help to preserve the land from nutrient depletion. Another idea that was given to farmers is the production and use of biochar which could improve the soil as well as the surrounding environment. Biochar is the end result of changing natural waste from plants into a fertilizer that holds high levels of carbon (What Is Biochar, n.d.). It will improve the nutrients in soil that has been depleted and increase food security. These new techniques of farming have and will allow farmers to produce more crops and some have already visibly improved the crop size and quality. Another way to increase food security is selective breeding and genetic modification to seeds. Maize seeds which have been modified to be harvestable in 90 days rather than the common 100 or 110 days could improve food security greatly. If a 90 day crop fails, the 10 or 20 day difference in starting a new crop could save a farmer and his family from starvation. Other plants which have been modified to survive in drought conditions could also be introduced to farmers. Many crops fail due to droughts or lack of proper irrigation so seeds which use less water could be life changing to farmers. These techniques will help improve agriculture and lower malnutrition in rural villages, but the changes on their own will most likely not greatly impact poverty throughout the country or lead to a major economic development of larger towns. However, the changes will help improve the lives of small farmers and their families village by village. Life overall can also be improved with the help of non-profit and NGO organizations. One organization has already gone to villages, like El Rodeito, and installed latrines and wash tables in every public area and many homes these allow families to stay clean and have improved health. Groups could help install filters and other simple-to-use technologies to keep rural people healthy and safe in their environment. With enough help from organizations around the world, all of these techniques and technologies could be implemented within four or five years and would require very little money if mostly volunteer work is used. Not only would these changes help rural people tremendously, it would also boost economies if materials are sourced locally.

The Honduran Government plays a large role in stopping the spread of hunger in Honduras. The School Feeding Program is funded mostly by the Honduran Government and is managed by the World Food Program. The School Feeding Program works to provide meals to nearly 1.5 million students throughout the nation. They work with more than 21,000 schools, both rural and urban, to keep children fed. The food is all local to each school which helps to strengthen the economy in rural and urban areas. The program also works with these schools to promote access to education and minimize gender inequality and segregation. The School Feeding Program is a major step in the right direction to increase food security and end widespread hunger in Honduras. With more funding, this program could be able to improve the lives of all children in school in Honduras. The Honduran Government is not the only group working to improve the lives of Honduran people. The United States Government's Global Hunger and Food Security Initiative on the Feed the Future project supports programs and partnerships in Honduras to create an access to markets and boost agribusiness. One program which is very important to reducing poverty in Honduras is the Dry Corridor Alliance agreement which focuses on raising 50,000 families out of poverty, reducing malnutrition and hunger by 20 percent, and improving the condition of 280 kilometers (174 miles) of roads and building new ones. The U.S. Government is a leading member of this alliance. There are also many other groups and NGOs (such as the Grameen Foundation, Proyecto

Mirador, Mayor Potencial, CARE International, and many others) which work to improve the conditions in Honduras. Each program, no matter how small or large, does its part to end poverty, malnutrition, and boost agriculture in Honduras.

In conclusion, sustainable agriculture is a reliable way to improve the crops of rural areas in Honduras, but there are many roadblocks in creating sustainable agriculture as well as improving the lives of Hondurans. One such roadblock is that rural farmers lack information and knowledge about how to change their farming techniques. Crop rotation, biochar, genetically modified seeds, and better forms of irrigation are all ways to improve the crop yield and quality of farms in small, rural areas. Microloans have already proven to be successful in rural areas and will most likely be the best way to support farmers financially. The sharing of techniques and information by NGO's and university research projects is important to help develop more sustainable farms. The non-profit organization Mayor Potencial has already begun this process of micro-loans and spreading new ways to improve agriculture in the village of El Rodeito. They are also addressing the education issues by fundraising and building a high school to improve education for children in the village and surrounding area. With more funding, this organization could potentially spread to more small towns to do the same type of work. If awareness of the situation and needs of rural farmers was to be spread throughout first world countries such as the United States, funding and loans could be more common. If farmers are able to use more sustainable methods, they will have less to worry about for their farms and families. With the help of Non-profit organizations, NGOs and other groups with the resources to help, unsustainable agriculture, as well as unsafe and unhealthy conditions in Honduras, are problems that will be changed and improved.

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