Austin Klauke

City High School

Iowa City, IA USA

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Infrastructure and Food Insecurity in Honduras

In the United States, it's easy to take for granted the things our government provides us. We're given clean water on demand, electricity during all hours of the day, and paved roads that can take you anywhere you'd want to go. In developed countries like the United States, these things are an afterthought, something you'd only notice when they aren't there. To most, it's almost impossible to imagine what their lives would be like without these essential services. However, those living in developing countries such as Honduras don't have to imagine. Life without these services becomes much more difficult. Paved roads, clean water, sanitation, and consistent electricity all become luxuries that only the economically productive, urban areas can afford. The lack of proper infrastructure—especially in the rural areas—is a major cause of poverty in Honduras. Due to that poverty, many Hondurans simply don't have the income to provide a nutritious diet for their families, if they have the money to provide any food at all. Right now, the current state of Honduras' infrastructure is a major factor limiting the development of impoverished communities, keeping them poor, hungry, and malnourished. However, with a proper development plan, it doesn't have to be this way.

Honduras is a Latin American country located in the middle of Central America. Its climate is very warm year-round, with wet and dry seasons in the summer and winter. The country features a large northern coast, home to a sizable fishing industry and several ports; forests that support a large agricultural industry based on bananas, coffee, lumber; and mountain ranges in the interior that restrict travel between the northern and southern areas (Britainica). While there is a large manufacturing industry in the urban centers of Honduras, a large portion of the country is used for agriculture, with around 30% of Honduras devoted to it (Trading Economics). Most of this land is used in industrial agriculture for the purpose of growing cash crops, such as bananas and coffee for North American companies (Trading Economics). The population of 10.8 million people is fairly evenly split between rural communities and urban areas, with around 40% of the population being rural and the rest being urban. Political corruption is a major problem within the country, with reportedly over two billion dollars being lost in 2018 due to bribes and theft from the lowest levels of government all the way to the top (ASJ). Also, economic issues such as poverty affect nearly half of the entire population (World Food Programme), and nearly 1 in 5 people face acute food insecurity, with those in rural regions being hit the hardest (IPC).

Family is very important in Honduran culture. Family serves as a guide for daily life and is a safety net for those in the family who are in need. Pressure is put upon individuals to provide for the family first and to put off all personal desires for their sake (AFS-USA). In isolated locations where jobs aren't easy to come by, a family might need to resort to subsistence farming to feed themselves ("Honduras Economy" World Bank). The average meal can vary wildly depending on the income of the household. More educated workers who work white-collar jobs can afford nutritious meals with a healthy balance of meat, vegetables, and grains (Britainica). On the other hand, the rural and impoverished of Honduras who are lucky enough to find a job with a consistent salary can only make a tiny wage working for large-scale agriculture and manufacturing companies (Remote People). Whether a poorer household gets their food from buying it or growing it themselves through subsistence farming, the diet mainly involves corn tortillas, rice, and beans due to their affordability and simplicity to grow. A downside of this is that many rural and impoverished Hondurans lack vital nutrients from meats and leafy vegetables. Due to this, many impoverished Hondurans suffer from health issues due to malnutrition, especially young children who experience developmental issues at crucial points of their lives ("Honduras Economy" - World Bank). These food-related health issues can compound to a point where it puts the lives of the affected persons at risk, an issue known as food insecurity.

Poverty is the main cause of food insecurity in Honduras, with 63% of the population living under the poverty line (World Food Programme). It's from this poverty that households lack the funds necessary to purchase nutritious food, if they have the money to purchase food at all. Around 20% of the population currently faces acute food insecurity, which is defined as "when a person's inability to consume adequate food puts their lives or livelihoods in immediate danger." (IPC, ADRA). To eliminate this danger, the first solution that comes to mind is to lift the affected population out of poverty; however this is much easier said than done. There are many complex factors that lead to families living in poverty; however, if we look at several factors that are keeping families in poverty, perhaps we can create a solution. Education is free in Honduras and encouraged for most, but due to issues such as poverty, crime, violence, and child labor, many don't complete their full education, exacerbating the existing poverty issues (Global Partnership for Education). If a child living in poverty has to drop out of school to help provide for their family, then it's impossible for that child to escape the poverty that causes food insecurity. Clean water sources aren't guaranteed, with many rural areas not being provided any at all (Benson). This leads to rural communities needing to rely on unsafe water sources, which cause health and hygiene issues that prevent those afflicted from being able to work, and by extension, buying food to eat. Roads in Honduras are overall inconsistent. In the well traveled areas, roads are paved and well maintained; the government invests money into keeping roads usable in order to promote economic flow. However in less profitable, rural areas, things such as lit, paved, and proper signed roads are anything but guaranteed (Country Reports). Rural roads can become nearly impossible to travel in bad conditions, meaning that for farmers who rely on traveling to community markets to sell their crop, bad roads could mean a wasted harvest which could lead to even worse poverty. Electricity is common in urban areas, but outside of those regions, electricity is highly inconsistent, putting those regions technologically behind the rest of the world (Dahl). Overall, there is a large disparity between the rural and urban regions of Honduras when it comes to services provided by the government. It's from these disparities that the cycle of poverty perpetuates itself; in order to break this cycle, its clear that equal infrastructure needs to be provided to everyone. When even the poorest citizens are given the same resources as everyone else, then they have

an equal chance to succeed and climb out of their poverty. The key to eliminating poverty and by extension food insecurity in Honduras is providing proper infrastructure — however this is an issue that's not getting better. While infrastructure has been invested in over the past couple years, the blatant corruption in nearly all levels of government prevents these projects from reaching their full potential (ASJ). Additionally, the recently elected president, Nasry Asfura, plans to cut public infrastructure projects to invest in trade. This means if we want equal infrastructure to be provided to everyone, we need to develop a plan of our own (Mendrala).

One tool that could aid Honduras' infrastructure development is the implementation of Public-Private Partnerships, or PPPs. A PPP is a contractual agreement between a government and a private company to develop and manage public infrastructure. For example, schools in the United States contract the help of companies such as Bound to assist in managing school sports. In these agreements, private companies are given strict deadlines and penalties regarding the completion of projects, so they are encouraged to do high quality and timely work ("Infrastructure Challenges and How PPPs Can Help" - World Bank). This eliminates inefficiencies that come from purely government managed infrastructure projects as well as governmental corruption, a huge factor in why rural infrastructure is in the state it is in now. Using PPPs, infrastructure construction projects could be completed in a suitable period of time and to a high standard in the places that require it. Another tool that could aid in the development of infrastructure is the implementation of the Spatial Economic Strategy or SES, a plan coined in the book *Honduras: A Territorial Approach to Development.* The current infrastructure in Honduras is concentrated in a T-shape, stretching across the north coast of Honduras and in a line across the mountains connecting the north and south. This current model only connects the most profitable regions such as the capital, Tegucigalpa, the major city San Pedro Sula, and the northern ports, which leaves the rest of the country relatively disconnected. What the SES proposes is a plan to expand the infrastructure network by expanding to precisely targeted areas based on location, inequalities, and economic potential (Almeida). Once a comprehensive road network is created, it becomes much easier to establish services such as electricity and water to the same places, bringing equal infrastructure to rural regions. However, the development of infrastructure such as this can be very costly in both money and time. Using the SES, the favoritism from the government that defines the current systems of infrastructure in Honduras will be circumnavigated. Resources will be directed to locations that need it the most and which will see the greatest return on investment, with the total development of Honduras in mind. Using tools such as PPPs and the SES, infrastructure development will become much more efficient and effective than just telling the government to spend more money. To develop a more comprehensive plan, one can look at plans being attempted right now.

One solution to infrastructure that is currently being implemented in Honduras is the Honduras Sustainable Connectivity Project, being managed by the World Bank. The World Bank is an organization that gives loans to developing countries in order to fund development projects; under this project, they aim to "improve climate-resilient and safe transport access in the northwest region of Honduras." They plan to do this through the construction of new highways as well as improving the quality of local roads. The project is still in its early stages, focusing most of the efforts on the construction of the new highway between the CA-4 to CA-13 highways in the northwest region of the country ("Honduras Sustainable Connectivity Project" - World Bank). While it is too early to see any major effects of this project, due to

its similarities with the SES, it's likely this project will create many jobs and realize the economic potential of the region. It's possible that given enough time, the completion of this project could lead to the desired effect of this research paper. Also, the project plans to implement many sustainable construction practices and to build their infrastructure to be climate resilient, both things one may want to consider in a comprehensive plan ("Honduras Sustainable Connectivity Project" - World Bank).

By looking at countries surrounding Honduras that face similar infrastructure challenges, such as Guatemala and El Salvador, we can learn from what solutions they implement. In Guatemala, the World Bank is implementing a 400 million dollar plan to upgrade their roads and infrastructure similarly to their Honduras Sustainable Connectivity Project ("Rural Connectivity in Guatemala" - World Bank). In El Salvador, the government approved one billion dollars to the development of infrastructure in the undeveloped eastern part of the country, focusing primarily on new roads and highways (Colantuoni). Using these separate plans, we can confirm what the SES only proposed. In order to bring equal infrastructure to underdeveloped communities, a reliable road network must be created, and other services will follow soon after. However, there's still the problem of funding. A project at this scale will likely cost upwards of 1 billion USD in total if we're using the previously mentioned development plan as a benchmark. For most poor, underdeveloped countries, a cost that high would make any solution on this scale unfeasible. Luckily, Honduras is located in a place in Central America that is very advantageous for trade, due to its proximity to the United States and its placement between other Central American countries (International Trade Administration). With proper investment into trade, it may become possible to fund a larger infrastructure development project without any loans from organizations such as the World Bank.

However, if the Honduran government is to oversee and carry out a potential project such as this, then the issue of corruption must be accounted for. Since corruption is a primary reason as to why the state of rural infrastructure got to the point it is now, it's reasonable to assume that it could prevent this project from reaching its full potential. To combat this, we can look at organizations such as the World Bank which deal with the same kinds of corruption one would need to consider in an exhaustive development plan. Since the World Bank is an independent organization, most of their anticorruption measures involve heavy surveillance of the governments they work with (WB - Anticorruption Fact Sheet). Since we can't control whether those monitoring for corruption in the government are also corrupt, we have to look towards more innovative solutions to ensure corruption won't get in the way. Some creative solutions that have been suggested by the World Bank include the implementation of blockchain technology, which to put into simple terms is a digital logbook which stores all of its publicly and securely across all computers connected to the system, removing the need for centralized banks which often lack transparency and facilitate the theft of public funding by those in power (Bahoo). Additionally, the use of artificial intelligence is suggested for the purpose of procurement and the monitoring/management of funds. Unlike government employees, an AI won't take or ask for bribes, meaning that through the use of AI any funds put aside for future projects will have very few chances to be stolen without the perpetrators being caught (WB - Anticorruption Fact Sheet). With these technologies working together, it almost guarantees that corruption won't completely hinder the success of any future development projects without inviting the supervision of outside organizations. Overall, it's clear that a development project of this scale will be a

very difficult endeavor. However, now that we've looked over some potential solutions, we can put together a solution of our own.

The plan that I recommend is a combination of all the previous strategies: an implementation of PPPs which targets the locations listed in the SES to expand Honduras' infrastructure network and create sustainable, reliable infrastructure for isolated and impoverished communities. Once the government establishes these basic roads and services are established with the help of PPPs, the economy in these areas will improve due to the creation of jobs, trade, and public utilities. With new jobs, reliable utilities, and safe travel, those living in isolated communities will ideally have all the tools necessary to lift themselves out of poverty and provide their families with nutritious meals. This plan won't be able to reach everyone at first, but after enough time, development should come to the non-targeted regions naturally through economic growth.

In practice, this plan could range anywhere from half a billion to over one billion dollars if we're using other countries as a benchmark, but with the new President Asfura's investments into Honduran trade, Honduras may soon be able to finance a project such as this without investments or loans from outside organizations such as the World Bank. If that is the case, then the methods proposed by the World Bank such as blockchain technology and artificial intelligence can be implemented in the role of acquisition and the transfer of funds in order to prevent corruption from hindering this project's success. The economic boost to the regions targeted in the SES also solves the issue of long-term maintenance. Since the government will want to nurture these newly developed economies in order to get a return on investment, they will most likely invest into keeping the infrastructure usable for many years to come. While a construction project on this scale could have some serious environmental consequences, as long as the inevitable carbon footprint is offset with the proper carbon handprint–a positive impact on the climate–it should cancel out (Mejia). Some examples of the carbon handprint that could be seen in this plan are the use of climate friendly materials, the planting of trees to offset deforestation, and the construction of more energy efficient infrastructure (VVT). Community participation in the targeted areas will also be an important factor to the project's success. Private companies and project organizers can work with community leaders and employ community members in order to get many different perspectives on the best ways to implement new infrastructure while also making it easier for communities to take over management once the infrastructure is built. All these components working together will provide a long lasting, sustainable, and reliable solution to Honduras' infrastructure challenges.

The acute food insecurity in Honduras is not a product of famine or environmental crisis. The people of Honduras are starving because of poverty – poverty that doesn't come from laziness but from the cycles that keep the impoverished poor and the government which does little to help them. Without proper roads, electricity, and clean water for everyone, those living in poverty have to fight even harder to provide for themselves and their families than you or me. In order to escape the cycle of poverty which leads to food insecurity, the government needs to expand its networks of infrastructure to more than just the most profitable regions, but to everyone. To do this, the use of the SES alongside the implementation of PPPs must be done to take what's being attempted in projects such as the Honduras Sustainable Connectivity Project and take it to its natural evolution. If the Honduran government were to correctly implement this plan, then given enough time food insecurity can be destroyed in Honduras for good.

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