

Knowledge of Climate Change in Developing Countries and Its Effects

Katelyn Song

Northern Valley Regional High School at Old Tappan, USA

ABSTRACT

Climate change impacts all countries, but the effects can be particularly staggering for low-income countries. While first-world countries such as the United States face challenges due to climate change and global warming, plenty of resources and research are available to address them. However, third-world countries do not have the same opportunities and assets to face climate change and overcome it. One such country is Honduras which is known for facing water security issues. A group of researchers and I went to Honduras to conduct research through the use of interviews and surveys on the impacts of climate change and how water is affected, resulting in the findings that people do not recognize climate change, yet it leads to worsened quality of life due to poor water quality, unreliable crop yield, and even job loss. The information from Honduras is further compared with other Central and South American countries, and the effects of climate change from an economic and social viewpoint are researched. Ultimately, the primary danger identified is people not taking climate change seriously, which leads to low-income areas becoming heavily impacted.

Introduction

Climate change undoubtedly affects every part of the world and is caused by every part of the world, although some more than others. In the United States, for example, the U.S. Global Change Research Program finds a rise in extremities such as heavy downpours and harsh heatwaves as well as more frequent and intense natural disasters like forest fires and hurricanes (U.S. Global Change Research Program, 2014). However, the United States is also known to be resilient in the face of climate change and sees minimal effects, especially when compared to other parts of the world. While the United States can withstand many consequences of climate change, the same results cannot be reproduced in low-income countries. In areas like rural Honduras, the impacts of climate change are seen firsthand, such as from floods and droughts, and these impacts have caused immense health and lifestyle damage that may be further exacerbated as climate change continues to worsen. Honduras, with a growing population of around 10 million people, is considered one of the poorest countries in Central America with 57.7% of the population living in poverty as of 2020 (The World Bank, 2023). For those living in poverty, necessities such as food and water are not guaranteed and are not the same quality as in high-income countries. In Honduras, water access is not consistent throughout the country, and water quality is particularly unreliable in rural areas, which is partially due to Honduras being located in the Dry Corridor. Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua all have territory in the Dry Corridor, a tropical region which often faces long droughts and heavy rainfall at unpredictable periods (2023, UN Environment Programme). Honduras has a notable water security issue caused by climate change, which impacts water quality through weather.

Despite this increased risk of losing water access and even jobs, there is a limited understanding of climate change. In Tegucigalpa, Honduras, only 2-8% of citizens found an increase in extreme weather events to be related to climate change (2023, Monitoring and Evaluating Climate Communication and Education Project). The differences economically, geographically, and even socially between countries like the United States

and Honduras lead to the question: what are the consequences of lacking knowledge of climate change in developing countries? Developed countries such as the United States see climate change and its effects differently from developing countries, which can result in negative environmental consequences for developing areas that are unaware of the implications of climate change.

Methods

All discussions and interviews when speaking with Spanish-speaking participants were handled with translators. Bilingual school students who were high school juniors and seniors spoke both Spanish and English, and they translated questions from English to Spanish and translated responses from English to Spanish.

Interviews were conducted with students from C.E.B. Juan de la Cruz Avelar located in Siguatepeque, Comayagua, Honduras. In groups of 3-4 with a translator, students were asked a series of questions in an open discussion regarding their experiences with sickness due to water quality, access to water, and their views on climate change. The bathrooms in the school were located outside of the buildings and manually emptied, and there were no sinks for washing hands afterward. In addition, a set of surveys was conducted one-on-one with a student and a translator including questions about climate change.

Surveys were also conducted with members of the Buena Vista community in Siguatepeque, Comayagua, Honduras. Pre-chosen homes in this community were interviewed by the researchers in groups of two along with a translator and were surveyed. The town had open waterways and a range of water access for each house. Many houses in this community burn trash outside and keep livestock as well.

The survey used for the C.E.B. Juan de la Cruz Avelar students and residents of the Buena Vista community included a set of 26 questions, which were answered using a scale of strongly disagree, disagree, somewhat disagree, neither agree or disagree, somewhat agree, agree, and strongly agree. The questions covered health, climate change, and education, and the last question had participants rank the importance of education, health, climate change prevention and sustainability, and economy/jobs.

There were open discussions with elder town leaders in Siguatepeque who were in charge of the infrastructure in their neighborhood, including Alfredo, who is a member of the board, Miguel Zelaya, who works with the government regarding climate change effects, and Donald, who is a secretary of the community board. The researchers had the opportunity to ask the elders questions about climate change with the aid of a translator and gather information. Another open discussion was held with nutritionist Anya, where researchers again had the opportunity to ask and take notes on climate change-related questions.

Findings and Discussion

The residents of rural Honduras feel the effects of climate change through unexpected seasonal changes. Out of a population of 10 million, 4 million Hondurans live in rural sectors, and nearly half of the population works in agriculture or other similar occupations (World Bank Open Data). Honduras has two seasons throughout the year: the wet season, which goes from May to October, and the dry season, which goes from November to April, with a short respite in between the seasonal changes (World Bank Group, 2021). However, climate change causes an inconsistency in the seasonal changes; according to community leader Miguel Zelaya, the rainy season started a month later than expected in Siguatepeque, Honduras, which meant that people, especially farmers, were not prepared for the seasonal change and did not know when to plant their crops. The seasons become hard to predict, which can especially cause catastrophic results for Hondurans who rely on the knowledge of when seasons start and end. The change in the dry season meant that people would need more water for their crops, and their fields would not yield anything for an uncertain amount of time. Along with the change in seasonality, temperatures become more intense, with the average highs increasing and the average

lows decreasing. A local student from the bilingual school, Conny, stated that her parents need to use thicker blankets compared to when they were younger as a result of lower temperatures. Additionally, a student from C.E.B. Juan de la Cruz Avelar stated that as a result of the high temperatures, it is extremely uncomfortable to be in a classroom. People in the community have even died from the heat before. Climate change has extremely tangible results in rural areas that worsen the quality of life for those living there.

Not only do the seasons become unpredictable, but storms and droughts that come with the wet and dry seasons become more severe as well. As a result of such heavy rainfall during the wet season, pipes and drains in Siguatepeque were clogged by water and garbage, and due to an accumulation of pressure, some pipes exploded, which left people with no water. This meant that locals had to rely on their neighbors for water or use their wells to gain access to water. In Siguatepeque, many people were left with no water for at least two weeks, and in other parts of Honduras, thousands of people were left without water for even longer than that. Even if the entire population had working pipes, the rain caused a runoff of dirt and sand that got into their water sources; even worse, contamination from human feces was pulled into the river, which also ended up in their water sources, leading to a wide variety of diseases and stomach pains. The storms also brought other issues; a student from C.E.B. Juan de la Cruz Avelar stated that many houses that were located near rivers were ruined during storms due to the water and strong winds that came. The dry season became more drastic as well. Due to severe droughts, some of the rivers dried out, leading to the animals that grazed near them not having enough water to drink. Additionally, the lack of a water source meant less access to water for the community. Whenever there were profound droughts and a lack of water, the people would manually decrease the amount of water going to homes to ration it as much as possible, which made daily life uncomfortable. Moreover, those who had small gardens in their homes did not have any rain coming down for their plants, which meant that they lost an easy source of food, leading to them having to spend more money on food from outside sources. For farmers, droughts had even worse implications, as they were not able to have proper crop yields. This would result in them having an unstable income from their primary jobs.

Despite the numerous negative consequences of climate change on local communities in rural areas, many people still do not believe it to be a serious issue. The understanding of climate change in areas such as these is mostly limited to those who have had more experience or those who have the knowledge of it from learning about it in school. For example, the community elders in Siguatepeque all stated that climate change had terrible implications for their communities due to its effects on their water sources and the income sources for farmers. Some of the students in C.E.B. Juan de la Cruz Avelar found that it was something serious and a growing issue because the water made people grow very sick more often. Although several people find climate change to be a pressing issue, the mindset is not shared with everyone in this particular community. In a survey done in Siguatepeque, Honduras of thirty people, when ranking education, health, economy, and climate change in order of most importance, climate change was most likely to be placed 4th, and then the next highest likelihood was in 3rd. Despite being seen as the least important, especially when compared to health and education, climate change has the most connection with the rest of the issues if it is not solved or at least addressed. Unlike in Honduras, however, a poll done in 2023 from 13 Latin American countries finds that 91% of respondents think that climate change impacts their daily lives with 57% of them saying that it affects them “very much” (European Investment Bank, 2023). In comparison, we found that this can be compared to over 50% of local rural Hondurans who agree to find climate change to impact their daily lives and 36.7% who “strongly agree.” Although the majority of Latin Americans find climate change to be something that impacts their daily lives, rural Hondurans did not find it to be nearly as large of an issue. Worsened seasonal changes can lead to an unstable income for many people who rely on agriculture, and the weather changes can lead to severe illnesses that affect more people than before, but many Hondurans seem to be unaware of the link between these causes and effects.

Other Latin American countries and Caribbean islands are also affected by climate change in very similar ways to Honduras. Countries near the Parana-La Plata Basin in south-eastern South America relying on

hydroelectricity have had issues with electricity due to an increase in droughts that render that form of technology useless. Additionally, Central and South American forests are being burned by the growth of wildfires. Overall, as a result of severe natural disasters in Latin America, there were many deaths and billions of dollars of economic loss (World Meteorological Organization, 2023). Nonetheless, the agricultural sector is the one being impacted the most by climate change, especially in lower-income areas. For example, the GDP of Honduras is expected to decrease by 5.4% by 2050 as a result of the impact of natural disasters on their most reliable exports such as coffee, corn, bean, and sugar cane. In Honduras alone, there is a predicted job loss that reaches thousands of people for those who work in agricultural areas which are the most vulnerable. These job losses could lead to at least five million going into poverty by 2050 (Siegmann et al., 2023). Additionally, many Hondurans may end up leaving to escape the effects of climate change on agriculture as they are losing their jobs due to difficulty farming (Peñaloza & Rose, 2023). In Bolivia, there is a predicted 20% decrease in annual income as a result of changes in temperature and precipitation in agriculture due to decreases in crop production. This can lead to worsened food insecurity for those who rely on agriculture as their main source of sustenance (United Nations Economic Commission for Latin America and the Caribbean, 2016). While it seems that a majority of residents in Latin America find that climate change has a strong impact on them, many of the rural residents still doubt the effects of climate change on their lives.

Conclusion

If those living in rural areas are unaware of worsening climate change, it can lead to more critical impacts on their daily lives, especially when compared to developed areas and developed countries. Climate change can result in worsened water quality and access which can lead to sickness and poor crop yields for farmers, ultimately leading to emigration. Even when many people may identify climate change as a problem in their daily lives, it does not necessarily mean that they will be able to solve their issues immediately. To be able to adjust to the changes in their daily lives from unpredictable seasonal changes and severe natural disasters, more people need to learn about climate change and its effects and adjust to be able to survive the heightened stakes of climate change. Climate change will only continue to worsen as time goes on, and it is crucial that all countries, developed or not, are prepared for the results of it.

Acknowledgments

I would like to thank my advisor for the valuable insight provided to me on this topic.

References

Asociación Hondureña De comunidades En Desarrollo. *The City and Climate Change Management and Adaptation*. (2023). Monitoring and Evaluating Climate Communication and Education Project.
<https://mecce.ca/wp-content/uploads/2023/11/Honduras-Case-Study-Report-2023.pdf>

Climate Change Threatens the Basis of Food Security in Latin America and the Caribbean: Agriculture. (2016, August 2). Economic Commission for Latin America and the Caribbean.
<https://www.cepal.org/en/pressreleases/climate-change-threatens-basis-food-security-latin-america-and-caribbean-agriculture>

Climate Change Impacts in the United States. (2021). GlobalChange.gov.
https://nca2014.globalchange.gov/downloads/low/NCA3_Overview_LowRes.pdf

Climate Change Vicious Cycle Spirals in Latin America and Caribbean. (2023, July 5). World Meteorological Organization. <https://public.wmo.int/en/media/press-release/climate-change-vicious-cycle-spirals-latin-america-and-caribbean>

Helping farmers beat the climate crisis in Central America's Dry Corridor. (2023, June 16). UN Environment Programme. <https://www.unep.org/news-and-stories/story/helping-farmers-beat-climate-crisis-central-america-dry-corridor>

Honduras - Climatology. (2021). Climate Change Knowledge Portal. <https://climateknowledgeportal.worldbank.org/country/honduras/climate-data-historical>

Honduras Overview. (2023). The World Bank, <https://www.worldbank.org/en/country/honduras/overview>

Large Majority of Latin Americans Demand Stricter Climate Policies, EIB Survey Reveals. (2023). European Investment Bank. <https://www.eib.org/en/surveys/climate-survey/6th-climate-survey/latam>

Peñaloza, M., & Rose, J. *Uprooted: How Climate Change Is Reshaping Migration from Honduras.* (2023, July 23). NPR. <https://www.npr.org/2023/07/21/1189253504/climate-change-migration-honduras>

“*Rural Population - Honduras.*” World Bank Open Data, The World Bank, data.worldbank.org/indicator/SP.RUR.TOTL?locations=HN.

Siegmann, K., Bondarenko, E., & Scott, K. *Honduras, Moving towards Becoming a More Resilient and Inclusive Country in the Face of Climate Change.* (2023, May 25). World Bank Blogs. <https://blogs.worldbank.org/latinamerica/Honduras-more-resilient-country-climate-change>