# AMRO

## AMERICAS REGION

## REGIONAL GUIDE

AMWHO

*2023 AMWHO INTERNATIONAL CONFERENCE*

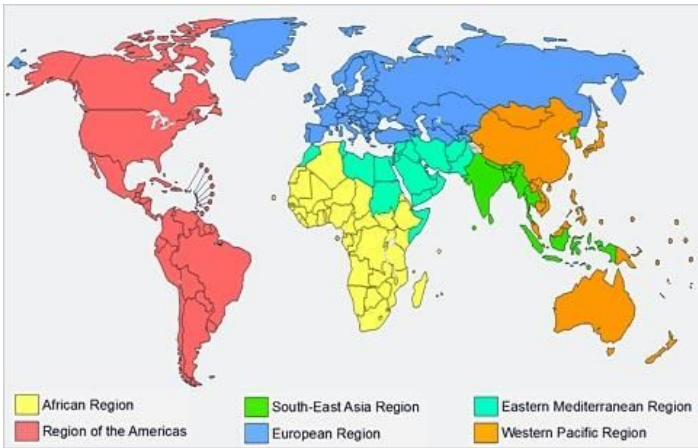
**PLANETARY HEALTH AND THE HUMAN CONDITION**

# INTRODUCTION

The World Health Organization's (WHO) Americas Region (AMRO) consists of 35 countries and is spread across the entire Western Hemisphere.[1] PAHO is the specialized health agency of both the Inter-American System and the United Nations (WHO). They work together towards the goal of ensuring that all people of the Americas are optimally healthy by implementing strategies that target well-being across socioeconomic levels.[1] Across the Americas, the climate ranges from dry deserts to tropics with varying rainfall depending on proximity to the equator, and the landscape varies vastly from tall mountains to low or hilly plains. The AMRO region consists of countries ranging in economic development, diverse cultures, languages, and racial and indigenous groups. However, with the increase in development and technology in the more developed countries of the region, the poverty gap has widened. Its negative effects continue to worsen issues of air pollution, noncommunicable diseases, influenza pandemics, fragile settings, and many more.

The Pan American Sanitary Bureau, created in 1902 to partner with PAHO, was specifically created (with the Panama Canal in focus) to investigate pestilent disease and improve sanitation conditions to ensure better environments for greater health.[2] The challenges the region has faced over the past century of disease spreading through maritime commerce were met with many advancements in health policies, development, and social conditions. By the end of the century, however, significant problems arose with lasting effects regionally and globally, like poor environmental health.[2]

One of the biggest threats to this region and the world is the transgenerational impact of climate change. Between 1966 and 2015, 60% of all climate-related disasters affecting small island developing states (SIDS) occurred specifically in the Caribbean, accounting for 90% of deaths and almost 90% of damage costs during that time, despite contributing minimally to the global carbon footprint and emissions.[3] While climate change is a tremendous environmental threat to SIDS and larger nations, the well-being, culture, and economies of countries in the Americas are also being affected. 67% of healthcare facilities are located in areas at risk of disasters, and 24 million were left without healthcare access due to damaged infrastructure caused by climate change in the last decade.[4] These risks to health and well-being have caused PAHO to respond by creating region-wide action plans. Some of their actions of involvement included supporting countries in policy preparation and strengthening national surveillance, improving health infrastructure, providing training and awareness-raising, and mobilizing resources on climate change and health.[4] However, WHO recognizes that there is still great work to be done to create structural changes that will equally improve the health of our planet and all the individuals on it.



## FAMINE AND FOOD INSECURITY

Hunger in Latin America and the Caribbean (LAC) – a subregion of AMRO – is at its highest point since 2000, increasing by 13.8 million from 2019 to 2020 and currently sitting at a prevalence of 9.1%.[5] Although this steep incline was exacerbated by the COVID-19 pandemic, there are vulnerabilities within the LAC's food systems that must be addressed as hunger has been on the rise since 2014.[5] As discussed further in the case studies, climate change has caused natural disasters in myriad countries that have also contributed tremendously in harming food security and leaving more going hungry. Hunger and food security are two terms commonly used interchangeably, but it is important to distinguish between the two for understanding elements of this subtheme.

- Hunger is defined by the USDA as the uneasy or painful sensation caused by a lack of food and is considered but not measured directly as an individual-level physiological condition possibly resulting from food insecurity.[6]
- Food insecurity is defined by the USDA and Feeding America as when households cannot acquire adequate food for one or more household members due to insufficient funds or resources required for obtaining food. For a household to be considered food secure, they should have assured access to readily available, nutritionally adequate, personably acceptable, and safe foods, acquired in a socially acceptable way.[6]

Four out of every ten people in the LAC region (267 million) experienced food insecurity in 2020 and impacted women disproportionately (~ 10% difference) compared to men.[5]

The immense impact hunger and food insecurity have on myriad countries across the AMRO region call to light the disparities and vulnerabilities of food systems, and climate change specifically has exacerbated famine and food insecurity across the region, as is evident in the following case studies.

### CASE STUDY 1: HUNGER IN HAITI

In the 2022 Global Hunger Index, Haiti ranked 116th out of 121 countries with a score of 32.7 out of 50, indicating that their hunger level is very serious.[7] Between 2014 and 2022, the prevalence of undernourishment increased by around 6%--affecting now almost half of the population under 5.[7] According to the latest Integrated Food Security Phase Classification (IPC), a record 4.7 million people are facing acute hunger (IPC 3+), including 1.8 million in the *Emergency* phase (IPC 4) and 19,000 people, for the first time in their history, are categorized in the *Catastrophe* phase (IPC 5).[8] The massive earthquake that killed more than 2,200 people in the Caribbean last year has induced a major economic crisis in Haiti.[9] Now, Haiti has an inflation rate of 26%, which makes it difficult for families to afford food, and across the country, many report not knowing where their next meal will come from.[9] The hunger crisis trapping Haiti is the result of this domino effect: poor planetary health leads to increased natural disasters, causing economies to be negatively impacted and the population is left vulnerable to hunger and food insecurity.

Haiti is at high risk – ranking third on the 2020 Climate Risk Index – for future natural disasters to drive its populations into a greater lack of food and resources.[10] After the earthquake last year and the following aftershocks, over 800,000 people were impacted.

Harvests were lost from both this major earthquake and the low rainfall of the year, further harming the food supply and creating a crisis. In addition to natural disasters, political turmoil and violence have also taken a large toll on Haitians, cultivating their civil unrest and paralyzing economic activities to lead to the staggering inflation rate reported above, a loss of work, markets, health and nutrition services, and unaffordable fuel for transporting food and goods. The intersectionality of hunger, natural disasters, and political instability as being key players in Haiti's current state highlights the overarching theme of planetary health's relationship between human health and actions and the environment and calls both humanitarian organizations and world leaders to action.

Humanitarian efforts like Save the Children, UN World Food Program, and Action Against Hunger deployed teams to respond to areas most affected by the earthquakes, rolling out emergency education, protection, water and hygiene, and mental health and nutrition programs.[9] The UN World Food Program prepositioned stocks of emergency foods before hurricane season to help mitigate the impact of future disasters, providing school meals in over 100 schools, and addressing immediate food needs through cash assistance programs while building resilience through rehabilitation projects like soil conservation and repairing irrigation canals.[10] The UN's Food and Agriculture Organization (FAO) also has provided emergency livelihood support to small-scale farms left in ruin after these natural disasters in cash for work, food crop production assistance, goat and poultry breeding assistance, and food storage and processing support for school feeding programs.[10] While these and myriad other humanitarian agencies are rallying together to provide aid and relief to this struggling country, there is still much to be done on the domestic front through policy changes to fix this systemic hunger crisis in Haiti.

## CASE STUDY 2: FOOD INSECURITY IN VENEZUELA - DROUGHT AND POLITICAL INSTABILITY

According to the 2022 Global Food Security Index, Venezuela is ranked overall 106th of 113 countries with a score of 42.6, indicating an alarming level of food insecurity among the population.[11] When stratified based on affordability, availability, quality and safety, and sustainability and adaptation, Venezuela scored far worse than any other country in the entire AMRO region on a myriad of subsets, such as a dangerously low sufficiency of supply and scoring a 0 relating to food security strategies or agencies, nutritional standards, and disaster risk management.[11] To put these statistics into context, Venezuela is facing major food insecurity compared to all other countries in the AMRO region due to a lacking food supply, but more importantly because they lack adequate policies and political infrastructure to produce proper strategies to prepare for disasters.

The issue of an overall lack of adequate political infrastructure can be seen in the years of mismanagement of their rich resources and corruption has caused the worst economic meltdown in Venezuela's history.[12]

Venezuela additionally has been experiencing accelerating, chronic climate shocks–specifically prolonged droughts–and stresses, causing further displacement of both citizens and refugees.[13] Because of a lack of government action, Foreign resource abuse also produced harmful effects, as Venezuela's government's feeble attempt to provide food aid was cut back by U.S. economic sanctions targeting the oil industry.[12] These avoidable factors have led to widespread malnutrition, and the U.N. in 2020 estimated nearly one in three Venezuelans (> 9 million) were "food insecure" and living in extreme poverty.[12,14]

In response, the World Food Program was signed to hand out meals to 1.5 million preschool children, children with disabilities, and school personnel in the poorest areas of Venezuela. All beneficiaries received food rations to cover 30 days' worth of nutritional needs to take home, and they are working to shift to providing on-site meals. They have had lots of success over the past few years, reaching 210,000 beneficiaries in states with implemented school meal programs and collaborating with other national agencies to strengthen the capacities of the lacking public institutions discussed previously.[14] Venezuela's food insecurity and poverty are directly linked to the misuse of resources and political insufficiency, and in order to make strides toward improving these conditions, major political changes and help from humanitarian organizations are crucial.

## CASE STUDY 3: FOOD INSECURITY IN GUATEMALA - VARIOUS NATURAL DISASTERS AND POVERTY

In Guatemala, hunger and food insecurity are directly linked to the poverty crippling their country, and in this arising issue, major inequities disproportionately affect indigenous peoples.

The prevalence of malnutrition–46.5%– is the highest in Latin America and the Caribbean, and chronic undernourishment has disproportionately affected indigenous populations at rates almost double those of non-indigenous populations.[15,16] Of its 17.4 million inhabitants, over 3.9 million experienced severe food insecurity this year, and this can be linked to Guatemala's impoverished conditions.[17] Two-thirds of the overall population lives on less than 2 US$/day, and over 80% of the indigenous population are disproportionately affected by poverty and deprived across myriad aspects of their lives, from food security and nutrition to health and education.[15]

Guatemala is also among the 10 most vulnerable countries to natural disasters and climate change. After long periods of drought, unpredictable storms and hurricanes led to mudslides that wiped away crops and left pests and diseases, then more droughts followed.[18] The extended dry seasons over the past three years have severely impacted the livelihoods of farmers.[15] Poor soil conditions, over-exploitation of forest resources, degraded lands, small plot sizes, and lack of access to supplies, credit, and technical assistance have also driven agricultural profitability and productivity down even further.[15] The ability of farmers to invest in future harvests has been diminished by the high costs of inputs and fuel, translating harshly to reduced sources of employment and increases in prices of food, the main drivers for their food insecurity situation. Almost ⅓ of households were forced to use crisis and emergency coping strategies to deal with limited and poor food consumption.[17]

Countries in the Latin American and Caribbean region currently have more than enough food available to support the populations, with a regional self-sufficiency rate of 117%.[19] The issues surrounding food insecurity in the region relate to access to foods and the stability of production.

Latin Americans pay 11% more than the average global citizen for food, so when countries like Venezuela and Guatemala are stricken by poverty, there is even less ability to access affordable foods to sustain the populations.[19] Climate change especially threatens the stability of food production in the region, so as these countries are also being threatened by natural disasters, food insecurity becomes even more prominent. The paradigm of food security equating to a copious supply must be changed to a quality supply that is affordable for the population and respectful of the environment. Without the implementation of national natural disaster risk strategies and environmentally-cautious resource management, food insecurity will only worsen across the region and globally. Our planet's condition has been worsening as we have been neglecting it, and its impact across aspects of livelihood has been transient in the increase of natural disasters driving up food insecurity.

## INFECTIOUS DISEASE

While the COVID-19 pandemic has maintained its place in the news headlines for over two years, the Americas are struggling with more than one disease outbreak. Such disease outbreaks can be attributed to the environmental changes influenced by human activity. As society continues to contaminate water sources, overtake wildlife habitats, and contribute to global climate change, we threaten ourselves with the disease reservoirs within nature. AMRO includes countries with a wide range of wealth, and financial and governmental stability, which disproportionately affect each country's ability to respond to an outbreak. Countries with political tension and/or ineffective public health policies struggle to ensure the security of their population and protect them from disease. The AMRO region has struggled with many vector-borne diseases which are often exacerbated by climate change and deforestation.

### CASE STUDY 1: THE ENDEMIC NATURE OF DENGUE FEVER IN BRAZIL

In PAHO's Epidemiological Update for Dengue, Chikungunya, and Zika in 2022, Brazil reported the highest number of dengue cases in the PAHO region with 2,131,615 cases making up ~88.1% of total cases in the region.[20] Since Brazil's first dengue epidemic in 1846, the nation has had 24 dengue epidemics and dengue fever has become endemic to the nation and its citizens.[21] Dengue fever is an infectious disease that is transmitted through an infected mosquito's bite.[22] There are four main serotypes or strains present in Brazil and infection with a serotype grants the infected individual permanent immunity to it and is believed to protect the individual from other serotypes for one to three years.[22] In Brazil, dengue is spreading from more urban areas to less populated areas that were previously free of dengue transmission. In the last five years, 481 municipalities have reported community dengue transmission for the first time and many of these are in the South region.[22] This suggests that the southern region of Brazil is becoming better suited in climate for *Ades* mosquitoes, increasing the risk of vector-borne diseases in nearby countries as well. One can suspect that the combination of the vector strain, a susceptible human population left vulnerable by the current COVID-19 pandemic, and a variety of favorable conditions can be associated with a rise in infected populations.[22]

Vector-borne diseases are highly sensitive to changes in temperature and precipitation which can be a result of global climate change. The effects of climate change are numerous and its influence on people plays a factor in mosquito vectors. As families relocate to escape the heat, they contribute to deforestation and migration. This in turn creates climate refugees who may carry dengue fever and result in dengue outbreaks in new areas. Additionally, with the increasing temperatures, mosquitoes take less time until maturity due to faster reproduction, bite more frequently, and the dengue virus, itself, replicates faster within the mosquitoes.[23] Warmer climates also mean that the vector mosquitoes are able to further their reach and expand their range and extend their active season.[23]

Disease outbreaks generate a burden on a nation, its population, health systems, and the economy. In 2008, an outbreak in Rio de Janeiro caused 158,000 cases, more than 9000 hospital admissions, and hundreds of deaths. The gravity of the outbreak reached the point of military intervention where they aided the response with vector control operations. An important issue with dengue fever control is the fact that governments do not allocate adequate resources to address the human and economic costs due to neglecting its severity.[21] As dengue fever is vector-borne, one of the best methods to attack the spread of the disease is to address the vectors, the mosquitoes. The WHO offers many solutions for vector control including prevention of mosquito breeding and active mosquito and virus surveillance. This entails removing access to habitats where mosquitoes prefer to lay eggs in through environmental modifications, proper waste disposal, monitoring water storage containers, applying appropriate insecticides, and monitoring the prevalence of the virus in the mosquito population combined with clinical and environmental surveillance.[24]

Educating the community on the risks of vector-borne diseases and encouraging their participation in vector control is important as well.

## CASE STUDY 2: THE HARMFUL POLITICIZATION OF THE COVID-19 PANDEMIC IN THE UNITED STATES

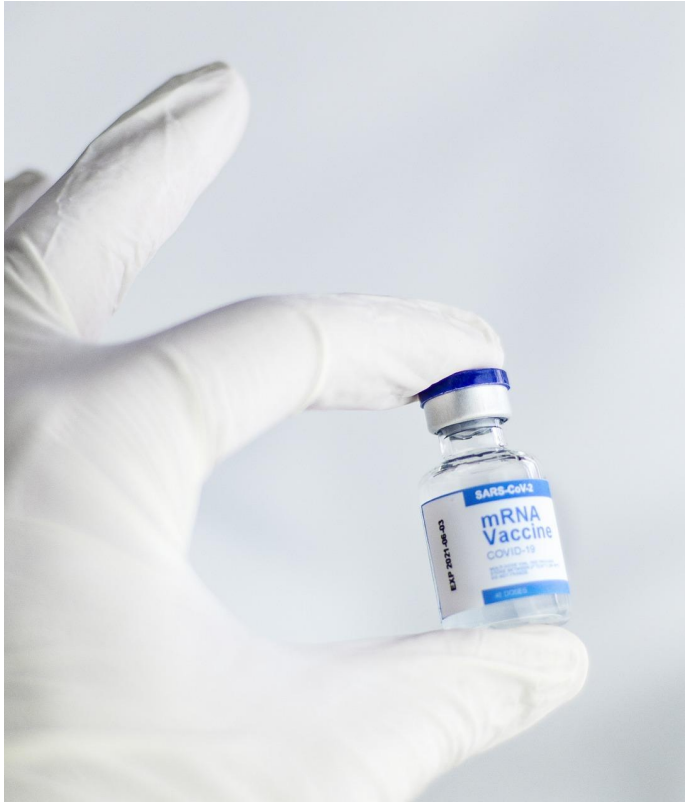
The COVID-19 pandemic has changed the world's perspective on infectious diseases and national governing systems. The United States of America has been seen as the standard for upward mobility and the land of the free. The U.S. is home to 331 million people with a diverse array of ethnicities, races, nationalities, and more. Sharing its borders with Canada and Mexico, the US is the center of trade and relations, making it a nation with an ever-changing population as people immigrate and emigrate. The United State's initial response to the COVID-19 pandemic can be characterized by widespread resistance to the government's calls for quarantining and rampant political tensions. The pandemic had the potential to become a platform for the US to demonstrate competent governing and a strong public health response but instead, it became one of political polarization.[25] This polarization harmed the public health response in the United States and the government's ability to enforce mask-wearing regulations and quarantining.

Moreover, communities were disproportionately affected by coronavirus due to exposure to air pollution. A National Institutes of Health-funded study found that there were "nearly 20,000 extra coronavirus infections and 750 deaths associated with high levels of $PM_{2.5}$ (fine particles in the air that are 2.5 microns in width or smaller) from 2020 wildfires in 92 western US counties".[26] There are multiple studies demonstrating an increased risk of mortality due to $PM_{2.5}$ as extended exposure to poor air quality can lead to an increased susceptibility to infections and impair respiratory defense mechanisms.[27]

Coronavirus is a prime example of a zoonotic disease, a disease that can spread between animals and humans, that was exacerbated by deforestation and decreasing biodiversity. The practice of intensive livestock production is harmful as animals are bred in habitats that allow for pathogens to spread from animals to humans. Additionally, the animal's vulnerability to pathogens increases when kept in crowded conditions. Similarly, when humans take over the natural habitats of other animals, the interactions between humans and other animals increase, resulting in more opportunities for zoonotic pathogen spillover. Climate change, overall, is affecting various parts of disease reservoirs in animals, affecting transmission, and increasing the chance of the emergence of a new zoonotic disease in humans.[28]

In a time when the disease was new and vaccines and effective antiviral treatments were not available, the public response to non-pharmaceutical interventions was important. However, the politicization of these non-pharmaceutical interventions to the point that whether the interventions were practiced by the individual inferred their political affiliation and resulted in large communities across the US not engaging in effective pandemic responses. Somewhere along the way, the safety practices were examined through the lens of directly challenging aspects of conservative ideology, ideas of prioritizing individual freedom over egalitarian goals, and a desire for minimal government intervention, and those who held conservative views opposed the pandemic response.[29]

Leading up to the COVID-19 pandemic, the US public health field was challenged by an understaffed workforce that was unequipped to meet the needs of the communities they served. This was an issue that was only exacerbated by the sudden demand with the rise and spread of coronavirus along with underfunded basic public health programs including providing immunizations and more.




These two reasons along with a lack of emergency preparedness played a key role in the US's struggle to handle the pandemic and its increasingly endemic nature.[30]

The United States's disappointing COVID-19 response stressed the importance of well-funded, well-staffed, and well-supported public health infrastructure. Some changes to make in order to improve the United State's infrastructure are to reallocating public health funding, restructuring the public health sector, investing in workforce development, modernizing the tools used, and gaining community support and trust.[27] Additionally, taking climate action to prevent and reduce deforestation, air pollution, and harmful agricultural practices can help decrease the spread of disease. By reflecting on the COVID-19 response, the United States should address the inadequacies to be better prepared for similar widespread emergencies.[30] Furthermore, the US government should reevaluate its environmental protection policies as they too play a major role in disease outbreaks.

## COMMERCIAL DIPLOMACY AND ENVIRONMENTAL INJUSTICES

The Americas are diverse in socioeconomic structures, wealth, and financial security, with countries ranging from developed, developing, or underdeveloped. A large majority of this region invests in international trade often by involving the agricultural industry, access to fossil fuels, natural resources, and more. Resource-rich countries like most of South America find themselves destroying their environments in order to harvest produce or meat, clearing land to mine resources, and logging timber, for the capital-rich countries. Resource-rich countries engage in such harmful behavior to improve their economic status and power. The production, consumption, and harvests of resources are a direct product of global economic relationships which need to be reevaluated and improved upon. With trade agreements that strongly encourage participating member countries to liberalize trade, developing and underdeveloped nations are pressured to meet the global needs for products and resources despite the environmental protection clauses.

### CASE STUDY 1: NATURAL RESOURCE MINING IN CHILE

Chile is a South American country that relies on mining profits to benefit and improve its economy. Chile is the top copper producer in the world and the second largest producer of lithium in the world, accounting for 29% and 22% of the world's production of these resources, respectively.[31] While mining is deeply rooted in Chilean history, the primary motive for mining is that the trade with the mined natural resources accounts for most of the country's Gross Domestic Product (GDP).[31] However, it is important to consider whether the various harmful effects of mining are worth the capital it procures.

Chile's mining industry is supported by four major companies: state-owned Codelco, BHP, Antofagasta PLC, and Anglo American PLC.[32] With the support of foreign investment, Chile is one of the fastest-growing economies in Latin America and is attractive for its business environment. China and Codelco have a free trade agreement as Chile exports copper and lithium to China; China has even become the number one trading partner of Chile.[33] After a history of failed mines and disrupted communities and ecosystems, Chile opted for "The Sacrifice Zone" which is an area that environmentalists refer to as a "saturated zone" as all pollution levels are above accepted levels.[31] Arguments over areas like "The Sacrifice Zone" have sparked fear over the economic status and security of Chile which allows for such damaging mines to still be in use at their present scales. At one Codelco smelter, the workers staged a strike after learning of the plans to close the smelter claiming that the company should make the plants sustainable and protect their worker's jobs rather than abandoning them in the name of the environment.[34] Another factor to consider is how Chilean mines discard of waste materials from the mining process. One Chilean mine dumped its mine tailings, waste materials from mine work, into the ocean which damaged one of the most "biologically productive ocean zones in the world". Marine biologists worry that other mines will follow its lead thus contaminating aquatic life and reducing the ocean's oxygen production.[35] Natural resource mines displace communities as they are forced to move elsewhere in an effort to protect their health.

From a governmental standpoint, Chilean officials should work towards making more tangible changes happen with the policies and bills they suggest as even citizens who are directly affected by the pollution created by environmental abuses voted against the bills.

In September 2022, Chileans rejected a proposal that addresses popular needs including labor rights regarding salary and unionization, and the environment claiming "nature has its own rights". From a worker's perspective, the proposed bills did not introduce any solutions to meet the needs of the people, and instead, the people of Chile opted for security over impactful change.[34] The Chilean government needs to invest in new avenues of income and revenue if the nation wants to reduce its environmental footprint. The citizens of Chile will not allow for the shutdown of major mining companies like Codelco without the assurance of new wealth prospects. Moreover, the government should add protection for the environment in the constitution to have more legal power in public-private negotiations.[36] Additionally, Chile should consider practical solutions regarding the mines themselves.

## CASE STUDY 2: DEFORESTATION OF BRAZIK'S AMAZON FOREST

While deforestation is often thought of as a process to meet the demand for more housing and other architecture or timber logging, Brazil's consumption of the Amazon rainforest is to meet the need for cattle grazing and beef production. Brazil is the largest exporter of beef in the world, the second largest producer, and has a national herd count of 213.6 million heads of cattle.

Brazil's agribusiness is on a continued uptrend as exports hit 14 billion US dollars in September 2022 with beef as the third most exported product of the year.[37] One can imagine the amount of land that must be deforested to sustain such an extensive number of cattle. By 2020, approximately 54 million hectares of the Amazon rainforest in Brazil were converted to pasture land.[38]

JBS is the primary company that packages meat in Brazil that continues to be criticized for its poor surveillance of the cattle they buy, slaughter, package, and sell. JBS continues to make outrageous claims about its commitment to excluding illegally raised cattle from its products but an examination of Brazil's cattle industry proves how easy it is to launder cattle into legitimate supply chains. One method is to frequently switch the ranches the cattle go through to make it difficult to track their origins. JBS only examines the direct suppliers of the cattle which makes it easy for them to make bold claims of contributing to zero deforestation despite not delving into their indirect suppliers. JBS's lack of surveillance of the illegal portion of the cattle industry's supply chain has exacerbated deforestation in Brazil.[44]

There are many harmful effects of deforestation ranging from habitat conversion, increased risk of wildfires, degraded aquatic ecosystems, soil erosion, river siltation, and more carbon emissions.[39] The Amazon rainforest is one of the most important carbon sinks which absorbs carbon emissions and helps moderate global climate change.[40] As more and more areas of the Amazon emit more carbon than absorbed, the harmful effects of the loss of the Amazon as a carbon sink are innumerable, like temperature increases and worsening climate change Additionally, an increase in cleared land leads to higher risks of wildfires. The fires in the Amazon contribute to the emission of harmful greenhouse gasses that harm the ozone layer which protects us from the sun's rays.

In addition to the harmful effects on the environment, deforestation in the Amazon forest displaces the indigenous peoples that live within it. One such tribe is the Yanomami indigenous community which occupies a region between Brazil and Venezuela and is at risk of extinction.[38] The community claims their land has been invaded, their resources spoiled and snatched, and the home to thousands of illegal gold miners. The Yanomami made calls to action and continue to do so as the Brazilian government fails to protect their rights and land.[41]

A potential solution to the deforestation of the Amazon rainforest in relation to the cattle industry includes the need for a law that prohibits the purchase of goods that originate in deforested land.[42] Settlements to force corporations to clean their supply chains at the risk of mass boycotting are not enough strong enough to avert the various loopholes. Another solution is to develop a system that can incorporate the travel and shipment logs of the cattle into a tracking tool as digital software.[43]

## CONCLUSION

Our planet's health is quintessential to the livelihood of its inhabitants. As climate change has worsened over decades of environmental mishandling, the increased prevalence of natural disasters has had myriad downstream effects on the health of populations. Taking care of our planet is an international necessity, as countries with more resources – or powerful countries who want to take advantage of them – disrupt their environments for political and economic gain. In the AMRO region, with countries of not only diverse economic backgrounds and cultural experiences, but also extreme climate conditions harming these countries, we have seen widely varying conditions across nutritional health and equity and the spreading of communicable diseases and correlations with health infrastructures. As the issue of climate change is ignored and further exacerbated, food insecurity and infectious disease become more prevalent issues for the country, and commercial diplomacy can lead to environmental injustices that further those issues. Therefore, it is imperative that national leaders and legislators across the region and globe come together to make the necessary changes to improve the health and equity of our planet and of all people.

## WORKS CITED


1. Who We Are - PAHO/WHO | Pan American Health Organization. Accessed October 21, 2022. https://www.paho.org/en/who-we-are
2. History of PAHO - PAHO/WHO | Pan American Health Organization. Accessed October 21, 2022. https://www.paho.org/en/who-we-are/history-paho
3. Caribbean Action Plan on Health and Climate Change. :32.
4. Climate Change and Health - PAHO/WHO | Pan American Health Organization. Accessed October 21, 2022. https://www.paho.org/en/topics/climate-change-and-health
5. New UN report: Hunger in Latin America and the Caribbean rose by 13.8 million people in just one year - PAHO/WHO | Pan American Health Organization. Accessed October 25, 2022. https://www.paho.org/en/news/30-11-2021-new-report-hunger-latin-america-and-caribbean-rose-138-million-people-just-one-year
6. Hunger and food insecurity are not the same. Here's why that matters—and what they mean. The Counter. Published December 21, 2020. Accessed October 25, 2022. https://thecounter.org/hunger-food-insecurity-covid-19-feeding-america/
7. Haiti. Global Hunger Index (GHI) - peer-reviewed annual publication designed to comprehensively measure and track hunger at the global, regional, and country levels. Accessed October 25, 2022. https://www.globalhungerindex.org/haiti.html
8. 'Catastrophic' hunger recorded in Haiti for first time, UN warns. UN News. Published October 14, 2022. Accessed October 25, 2022. https://news.un.org/en/story/2022/10/1129537
9. Haiti: Hunger, economic crisis stall recovery a year after devastating earthquake - Haiti | ReliefWeb. Accessed October 25, 2022. https://reliefweb.int/report/haiti/haiti-hunger-economic-crisis-stall-recovery-year-after-devastating-earthquake
10. Haiti - Help People in Earthquakes, Hurricanes, Hunger & Poverty. World Food Program USA. Accessed October 25, 2022. https://www.wfpusa.org/countries/haiti/
11. Global Food Security Index (GFSI). Global Food Security Index (GFSI). Published October 25, 2022. Accessed October 25, 2022. https://impact.economist.com/sustainability/project/food-security-index
12. Otis J. Why the kids of Venezuela aren't getting enough to eat. *NPR*. https://www.npr.org/sections/goatsandsoda/2022/01/11/1071485460/why-the-kids-of-venezuela-arent-getting-enough-to-eat. Published January 11, 2022. Accessed November 9, 2022.
13. The climate crisis and displacement in Venezuela. Humanitarian Practice Network. Accessed January 13, 2023. https://odihpn.org/publication/the-climate-crisis-and-displacement-in-venezuela/
14. Venezuela (Bolivarian Republic of) | World Food Programme. Accessed November 9, 2022. https://www.wfp.org/countries/venezuela-bolivarian-republic
15. Guatemala | World Food Programme. Accessed October 25, 2022. https://www.wfp.org/countries/guatemala
16. Reducing food insecurity and malnutrition in Guatemala. Margaret A Gilliam Institute for Global Food Security. Accessed November 16, 2022. https://www.mcgill.ca/globalfoodsecurity/research-initiatives/research-projects/completed-projects/guatemala

# WORKS CITED


17. Guatemala: Acute Food Insecurity Snapshot l March 2022 - February 2023 - Guatemala | ReliefWeb. Accessed November 16, 2022. https://reliefweb.int/report/guatemala/guatemala-acute-food-insecurity-snapshot-l-march-2022-february-2023
18. Hungry and desperate: Climate change fuels a migration crisis in Guatemala. NBC News. Accessed January 13, 2023. https://www.nbcnews.com/science/environment/hungry-desperate-climate-change-fuels-migration-crisis-guatemala-rcna2135
19. Will Latin America face a food crisis in the future? Accessed November 16, 2022. https://www.iadb.org/en/improvinglives/will-latin-america-face-food-crisis-future
20. Weekly Epidemiological Update for Dengue and other Arboviruses. Accessed November 17, 2022. https://ais.paho.org/ha_viz/Arbo/Arbo_Bulletin_2022.asp?env=pri
21. .World Health Organization. *Global Strategy for Dengue Prevention and Control 2012-2020*. World Health Organization; 2012. Accessed November 17, 2022. https://apps.who.int/iris/handle/10665/75303
22. Codeco CT, Oliveira SS, Ferreira DAC, et al. Fast expansion of dengue in Brazil. *Lancet Reg Health – Am*. 2022;12. doi:10.1016/j.lana.2022.100274
23. Marano M. The Increasing Burden of Dengue Fever in a Changing Climate. The Rockefeller Foundation. Published November 10, 2022. Accessed January 14, 2023. https://www.rockefellerfoundation.org/blog/the-increasing-burden-of-dengue-fever-in-a-changing-climate/
24. Dengue and severe dengue. Accessed November 17, 2022. https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue
25. Quarcoo A. The Long-Term Impact of COVID-19 on U.S. Democracy | Think Global Health. Council on Foreign Relations. Published January 21, 2021. Accessed November 18, 2022. https://www.thinkglobalhealth.org/article/long-term-impact-covid-19-us-democracy
26. Coronavirus and Air Pollution. C-CHANGE | Harvard T.H. Chan School of Public Health. Published May 19, 2020. Accessed January 24, 2023. https://www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-pollution/
27. Semczuk-Kaczmarek K, Rys-Czaporowska A, Sierdzinski J, Kaczmarek LD, Szymanski FM, Platek AE. Association between air pollution and COVID-19 mortality and morbidity. *Intern Emerg Med*. 2022;17(2):467-473. doi:10.1007/s11739-021-02834-5
28. Lawler OK, Allan HL, Baxter PWJ, et al. The COVID-19 pandemic is intricately linked to biodiversity loss and ecosystem health. *Lancet Planet Health*. 2021;5(11):e840-e850. doi:10.1016/S2542-5196(21)00258-8
29. Kerr J, Panagopoulos C, van der Linden S. Political polarization on COVID-19 pandemic response in the United States. *Personal Individ Differ*. 2021;179:110892. doi:10.1016/j.paid.2021.110892
30. DeSalvo K, Hughes B, Bassett M, et al. Public Health COVID-19 Impact Assessment: Lessons Learned and Compelling Needs. *NAM Perspect*. Published online April 7, 2021. doi:10.31478/202104c

# WORKS CITED


31. Chile - Country Commercial Guide. Published September 30, 2022. Accessed January 13, 2023. https://www.trade.gov/country-commercial-guides/chile-mining
32. Chile Copper Mining Market by Reserves and Production, Assets and Projects, Fiscal Regime including Taxes and Royalties, Key Players and Forecast, 2022-2026. Market Research Reports & Consulting | GlobalData UK Ltd. Accessed November 17, 2022. https://www.globaldata.com/store/report/chile-copper-mining-analysis/
33. Copper and Lithium: How Chile is Contributing to the Energy Transition. Baker Institute. Accessed November 17, 2022. https://www.bakerinstitute.org/research/copper-and-lithium-how-chile-contributing-energy-transition
34. Vergara Á. The Sacrifice Zone | Ángela Vergara. Phenomenal World. Published November 12, 2022. Accessed November 18, 2022. https://www.phenomenalworld.org/analysis/chile-referendum-mining/
35. Augliere B. Countries like Chile still dump toxic mine waste in the sea. Can they stop? Oceana. Published March 28, 2018. Accessed November 18, 2022. https://oceana.org/blog/countries-chile-still-dump-toxic-mine-waste-sea-can-they-stop/
36. Weisbrod K. Environmentalists in Chile Are Hoping to Replace the Country's Pinochet-Era Legal Framework With an 'Ecological Constitution.' Inside Climate News. Published April 3, 2022. Accessed November 18, 2022. https://insideclimatenews.org/news/03042022/chile-ecological-constitution/
37. Beef. Brazilian Farmers. Accessed November 17, 2022. https://brazilianfarmers.com/category/discover/beef/
38. França F, Solar R, Lees AC, Martins LP, Berenguer E, Barlow J. Reassessing the role of cattle and pasture in Brazil's deforestation: A response to "Fire, deforestation, and livestock: When the smoke clears." *Land Use Policy*. 2021;108:105195. doi:10.1016/j.landusepol.2020.105195
39. Unsustainable cattle ranching. Accessed November 17, 2022. https://wwf.panda.org/discover/knowledge_hub/where_we_work/amazon/amazon_threats/unsustainable_cattle_ranching.cfm
40. Role of Amazon as carbon sink declines: Nature study. Published July 20, 2021. Accessed November 17, 2022. https://public.wmo.int/en/media/news/role-of-amazon-carbon-sink-declines-nature-study
41. In the Amazon rainforest, an indigenous tribe fights for survival. OHCHR. Accessed November 17, 2022. https://www.ohchr.org/en/stories/2022/08/amazon-rainforest-indigenous-tribe-fights-survival
42. Roriz J. How Big Beef Is Fueling the Amazon's Destruction. *Bloomberg.com*. https://www.bloomberg.com/graphics/2022-beef-industry-fueling-amazon-rainforest-destruction-deforestation/. Accessed November 17, 2022.
43. McCoy T, Ledur J. How Americans' love of beef is helping destroy the Amazon rainforest. Washington Post. Accessed November 18, 2022. https://www.washingtonpost.com/world/interactive/2022/amazon-beef-deforestation-brazil/