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Dominican Republic, Climate Change

Sustainable Horizons: Chatting a Clean Energy Future for the Dominican Republic

Nestled in the heart of the Caribbean, the Dominican Republic, boasts vivid green landscapes, white sandy beaches, mountains, and even volcanoes. These beautiful geographical features make it an island oasis and a popular tourist destination, however, behind all of this beauty lies a problem. Climate change is dramatically affecting this island nation in terms of food security. The confluence of many complex factors, including the energy sector and job loss, has allowed this to continue unaddressed for a long time, leading to ever-increasing food insecurity.

Despite being a middle-upper-class country, the Dominican Republic struggles with income inequality, climate change, and poverty, especially in urban areas, which strongly contribute to food insecurity and nutritional problems (World Food Program USA). The changing climate affects farmers' crops, resulting in lower yields, and increased hunger, which drives up food prices. When people start worrying about being able to afford food, stress and insecurities rise. Those who live within this nation, have access to education, but struggles remain, particularly for undocumented immigrants (Humanium). This is because the Dominican Republic's healthcare system has hospitals that provide essential care to their natives and the residents of their country; however, tourists and undocumented migrants may have to pay healthcare costs annually (RealtorDR). Many citizens of the Dominican Republic have access to amenities such as clean water and toilets, but income inequalities and poverty create barriers making people struggle to earn a living and dramaticising food insecurity. As the Dominican Republic tries pushing through these troubles, they continue to grow worse daily.

There is a big problem that those living in the Dominican Republic are being faced with as a result of a changing climate, the energy sector. The energy sector is responsible for many greenhouse gas emissions, agriculture, and industrial processes. This is a big issue because rising greenhouse gasses lead to rising temperatures, and this severely affects farmer's crop yields. With less crop yield, farmers and their workforce will struggle due to a loss of jobs. As a result, there will not be enough food to feed everyone causing food insecurity. The Dominican Republic, with an area of roughly 49 thousand kilometers, is home to some 10,790,744 people (World Factbook). Of their 49 thousand kilometers of land, roughly 51.1% is used for agricultural purposes and farming (Statista). Since agriculture is a major workforce in the Dominican Republic, they rely heavily on this land as their source of income, employment, and food yield (InterNations). Most families in the Dominican rely on local shops and farming to get food for themselves, however, if there are not enough crop yields, these markets will lose money since they have no crops to sell.

As of now, the Dominican Republic is more vulnerable than ever to weather events like hurricanes and tropical storms. Weather events can have a large impact on farming and crop yield. Since 1960, the average annual temperature of the Dominican Republic has increased roughly 0.45 degrees at an average rate of 0.1 degrees Celsius per decade. Furthermore, the number of hot days and nights has significantly risen since the 1960s (Climate Change Knowledge portal). If this trend continues, the prediction for 2030 will be even worse for both climate and food security. (Climate Links)

This issue has already greatly affected the rural and urban populations in very different ways. To start, rural populations have experienced significantly less rainfall than average and as a result, have been much drier. These dry conditions have placed an increasing demand on watersheds and water reservoirs while also affecting agricultural activities, farmers' income, and the availability of food (U.S. Embassy in The Dominican Republic). When farmers are unable to plant and harvest their crops due to this extreme heat, it leads to a shortage across the whole country since most people rely on local markets and farmers for their food. On the other hand, urban areas, specifically ones that border provinces such as Santiago Rodriguez, and Montecristi face large impacts from intense storms that are directly related to climate change. These effects can damage infrastructure, natural resources, and crucial economic issues such as agriculture (Duke University). In addition to affecting urban and rural populations differently, this issue affects men and women in different ways. For example, women often stay at home and have responsibilities in and around the house, which makes it difficult for them to adapt to climate change. However, men are often impacted by the sectors where they traditionally work, like agriculture or industries that are vulnerable to climate change. Changes in these weather patterns, and events strongly influence economic activities, posing a large threat to men (UNESCO). Lastly, this issue doesn't only affect people who are native to the Dominican Republic, but it also affects marginalized individuals, who are mostly affected by heat-related illnesses, and often die because healthcare is far too expensive for someone who struggles to find work (Duke University). Overall, these climate change-related health threats result in job loss, which in turn decreases agricultural production.

Now that we have some background information about everything that is happening in the Dominican Republic, it is time to introduce some solutions. Although the Dominican Republic currently has no solutions set in place to directly combat climate change, they are developing a high-efficiency stove project that will be on the border of the Dominican Republic and Haiti. These stoves aim to avoid deforestation and increase forest coverage throughout the country which would reduce greenhouse gas emissions from deforestation and increase the quality of life of the people living in those rural areas (CCAC) The solution would make food insecurity less of a problem since it would provide people with jobs and it would help agriculture. The Dominican Republic could make sure they produce enough food to keep people fed and the prices affordable especially for those who struggle to find jobs. This solution is decent, but it could be much better if the government found a way to get the community involved in the planning of this project and make sure that they are reaching the needs of the people who live on the border. This could be done by surveying those who live on or around the border so they know their stance is heard. They could also hire people to manufacture, distribute, and supply maintenance for these stoves which could contribute to the local economy. This solution is not the greatest, however, it does offer some pros such as reduced deforestation and lowered greenhouse gas emissions, while also being energy efficient. Although there are some pros to this solution, there are also some cons. First of all, it is very

expensive to start the project while also being expensive to maintain the stoves and obtain the supplies needed for these stoves. Also, these stoves may not have great availability to alternate fuel to run the machines.

Additionally, Germany has employed a system called the “Energiewende” which hopes to be more sustainable and have low carbon emissions. The “Energiewende” has huge goals for renewable energy and a phase-out of nuclear energy. This solution, although a good one, doesn’t meet the needs of the Dominican Republic since it aims to phase out nuclear energy but the Dominican Republic doesn’t currently use nuclear energy (ITA). Instead, the Dominican Republic relies on fossil fuels to get their energy. Furthermore, the Dominican Republic faces different socio-economic and infrastructural obstacles that make the direct application of the “Energiewende” less achievable. For example, the country's economic structure and energy needs differ significantly from Germany's, and the financial burden of implementing a system like the “Energiewende” would outweigh the benefits. The “Energiewende” does however offer some pros for the Dominican Republic and the first one is that it will create jobs for many people. This is necessary since climate change has stripped many working citizens of their jobs. Secondly, it will help to mitigate the effect of climate change by slowly phasing out fossil fuels and other energy sources in an attempt to change over to renewable energy. Lastly, it offers energy independence which means that the Dominican Republic will supply all their energy and not have to worry about things going wrong/ rely on other countries. With any solution, there are some downsides and with this particular solution, there are many downsides. The first is the initial cost. The initial cost of this project is really expensive and it would require lots of government funding and possibly funding from other countries. For example, Germany's Energiewende is estimated to cost 600 billion to 700 billion euros by 2030 (BMC). If a similar system were to be implemented in the Dominican Republic, the cost would reach billions of dollars which is a significant financial burden for a country with a GDP of 121 billion USD compared to one like Germany which has a GDP of roughly 4.5 trillion USD (World Bank Group). Another downside would be the existing infrastructure, in other words, there would be no use for the previous infrastructure and it would just sit around taking up space. There may also be some pushback from the government and private sectors due to the high costs and the big infrastructure changes. To alleviate this, a phased approach may be proposed where the initial investments are made in less financially renewable options like solar and wind, allowing the gradual transition and reducing economic shocks. Furthermore, incentives such as tax breaks or subsidies could be offered to encourage private sector participation, which would reduce resistance. With all of these pros and cons, this plan seems like it would be the best for people in the Dominican Republic since it would provide many people with jobs and food security for almost everyone living there, but it doesn't have the correct goal for the Dominican Republic.

Although these solutions are very good, they just don’t meet all of the requirements of the Dominican Republic since they are very expensive and will be difficult to carry out. The Dominican Republic is very hot and wet so the stoves would have to withstand many different temperatures and precipitation. Similarly, the “Energiewende” would be difficult to implement since if there is no sun, these machines won't be able to generate energy. Furthermore, these solutions would take a lot of resources while also taking up much land, which defeats the purpose of the stoves and creates less land for agriculture.

A solution that I propose is focusing on transitioning 100% to renewable energy by prioritizing solar and wind power, along with putting policies in place to encourage energy efficiency and sustainable practices across the country. Before implementing this solution there would need to be a plan of action which could be as follows. First, they should assess the plan by conducting energy audits to understand the current energy patterns. This would allow them to understand the current use of energy and how much energy is generally being used. They should then develop a policy that supports renewable energy development and secure funding for the project. Funding challenges and political opposition would make it difficult for the U.S. to fund foreign projects. Overcoming these obstacles would require strong advocacy from citizens and pressure on elected officials. Citizens can write representatives, advocate in groups, and participate in campaigns for international aid. This is very expensive so obtaining funding is crucial. Grants for renewable energy projects, technical assistance, and capacity-building programs are effective forms of aid. Convincing the public and government will be difficult, but emphasizing how stabilizing the Dominican Republic can reduce the pressures of migration, promote stability throughout the region, and create future economic opportunities for the United States may help.

For this project, organizations would have to manage and carry out this project, but luckily many organizations could do this including, the Dominican Republic Government, the USAID, and even the UNDP (United Nations Development Programme). These organizations would be able to carry out the plan the best due to their good history. Additionally, the UN's Sustainable Energy for All (SEforALL) initiative and other regional partnerships like CARICOM could play large roles in the transition to renewable energy in the Dominican Republic. Supporting these organizations through donations, advocacy, and public awareness campaigns can be very helpful in increasing their resources and even their influence. This project would be very expensive, so obtaining funding is crucial. Two main organizations would pay for this and it would be the Green Climate Fund Board and the local government. This is because the Dominican Republic has already previously funded some projects, just not on this big of a scale. Also, the Green Climate Fund Board assists in mitigating the effects of climate change in developing countries by providing them with resources. With the joint effort of the Green Climate Fund Board, the local government, and other international partners like (SEforAll) the Dominican Republic should be able to fund this project. Having community members engage in this project is crucial since having community support ensures their acceptance of this project. The government also plays a key role since it creates and enforces policies that could reward people for the adoption of renewable energy, and help with the funding of this project. Policies that offer rewards for using renewable energy such as tax credits, setting emission standards, and prioritizing buying from businesses using renewable energy, will be necessary for this project. This project would also have to overcome many social norms such as community preferences and local beliefs regarding land use. However, this project can be sustainable by focusing on training individuals for the job, and involving the community while staying open to change.

Overall, this project is a crucial step that is needed for the Dominican Republic to solve its issue of food insecurity which is directly related to climate change. By carrying out projects to slow the effects of climate change and eventually stop them altogether, the Dominican Republic must use this solution so they can adapt to the changing climate and be able to grow their crops and get the food they need so no one continues to suffer from food insecurity in their country.

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