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Pollution in the Island Nation of Trinidad and Tobago

The twin islands of Trinidad and Tobago are located in the southernmost part of the Caribbean. The main island of Trinidad is just 7 miles away from the South American mainland, the closest country being Venezuela (“Trinidad and Tobago,” 2006). The islands have a tropical climate with both dry and wet seasons, allowing for very diverse biomes consisting of tropical rainforests, coral reefs, and mangrove swamps. There are three distinct mountain ranges all running east to west and the flat valleys in between is where most sugarcane is grown. The country has a total area of 513,000 hectares, most of which is not suitable for agriculture. Currently 47,000 hectares of land are being used for agriculture (“Trinidad and Tobago,” 2020). The largest crop is sugarcane, most of which is exported outside of the country. It is the world’s second largest exporter of ammonia and menthol (“Trinidad and Tobago,” 2006). The population of Trinidad and Tobago is currently 1.399 million people. 53.2% of people live in urban areas and city populations have been slowly decreasing since 2000. 46.8% of people live in rural areas, and the trend has slowly increased since 2000 (“Trinidad and Tobago,” 2022). The country is governed through a parliamentary democracy where the lower house is elected, and the upper house appointed. The Prime Minister is the leader of the party that holds the most seats in parliament, and the President is the head of state (“Trinidad and Tobago,” 2006). This form of government is similar to Britain, as they were once a colony of the United Kingdom.

Many cultures and people from around the world make up these unique islands. The country’s population is a mix of people of African or East Indian descent along with some Europeans and Indigenous people of the area. Trinidadian meals exhibit this diversity with a plethora of different foods. Rice, plantains, beans, chicken, and potatoes are staples. In addition, “bushmeat” is very popular as well as resourceful, usually consisting of wild mammals that are abundant on the islands and hunted for food. Trinidadians have many options when it comes to getting food. Some people have access to local farms with produce, but many are reliant on imported goods. Both chain supermarkets and small independent shops known as “arros” are common (“Trinidad and Tobago,” 2006). Malnourishment and food scarcity has been decreasing over the years (“Trinidad and Tobago,” 2020). Nearly 100% of the population has access to electricity, as well as clean fuels and technology for cooking, but many families choose not to use these clean fuels due to the cultural tradition of cooking with oil fueled energy. Many houses are built with concrete as it is cheap and readily available, and homes are typically multi-generational. Trinidad and Tobago’s average family size is 3.64 people with a growing population (“Demographic Statistics,” n.d.). Many families are matriarchal meaning the head of the household is the mother or female adult. Unemployment became a large issue in the 1990s after oil prices dropped. The economy has slowly been recovering, but inflation is growing and causing a negative impact (“Trinidad and Tobago,” 2006). Unemployment most recently was at 4% and declining. The COVID-19 pandemic has taken a toll on jobs as well and is hard to estimate. Employment in the oil and service industries are highest and growing, while agricultural workers are decreasing due to less demand. The minimum wage was recently raised to \$17.50 TTD (Trinidad and Tobago dollars), and workers rights are protected under law. Children are also not able to work until 16 years of age, with few exceptions (“Laws and Legislation,” 2021). \$81,381 TTD is the average annual salary (“Average Salary Survey,” 2022). School enrollment is high for both girls and boys. Higher education is a goal for many students. The country has a national healthcare system, as well as privatized healthcare plans. Often people can afford healthcare, but it can still be difficult to access based on population size and transportation. Currently two of the biggest health problems are HIV/AIDS as well as

drug addiction. Trinidad and Tobago has a high rate of AIDS infections with 0.7% of the population having been diagnosed with HIV, but is working hard to campaign for sexual health and blood safety. Pollution and self-sustainability are both problems many families face, with the large oil industry being the main source of income for many people.

Trinidad and Tobago heavily relies on the oil trade, and 34.9% of the country's GDP (Gross domestic product) comes from the energy sector ("Oil and Gas Industry," 2018). With all of this oil comes pollution. Oil spills are common in Trinidad, considering how much of their oil is shipped overseas. Oil spills are so frequent that 498 have been reported since 2018 to 2021 ("It's Outrageous," 2021). These types of environmental disasters are extremely difficult to control once the oil is spilled, as the water moves the oil, and it can be difficult to extract from the ocean. Oil attaches onto fishing nets, making the nets difficult for use and the fish unsafe for consumption. Since the country is made up of two islands, they rely heavily on fish for their economy and diets. In 1992 an estimated 40,000 people relied on the fishing industry as their main source of income, ("It's Outrageous," 2021), and this number has risen as the population increases. Oil spills also make consumers steer away from seafood as they are afraid of possible contamination. A 2019 study showed that there was a high amount of carcinogens in the fish caught in the Gulf of Paria, a gulf west of Trinidad. This was due to the presence of Polycyclic aromatic hydrocarbons (PAHs) most commonly found in crude oil. This study concluded that seafood consumption put 14% of the population of Trinidad and Tobago at risk of health issues annually ("UTT Study Confirms," 2019). The oil over time also covers seabeds, forcing fish to migrate ("It's Outrageous," 2021). Many fish are able to cleanse themselves of harmful chemicals but the carcinogens can still accumulate in their bodies and make them unfit for human consumption, and many marine organisms such as mammals, turtles, seabirds, and coral are poisoned by ingestion or absorption of crude oils ("Oils (hydrocarbons)"). Bioaccumulation is the gradual increase of pollutants over time across the food chain. If some small fish consume PAHs and a larger fish eats those small fish, they have a much higher concentration of the PAHs, causing it to be dangerous as it travels up the food chain.

While the ocean is polluted, so is the air. In the Trinidad and Tobago *State of the Environment Report* defined an air pollutant as, "...a substance whose presence in the atmosphere is determined to cause or likely to cause harm to human, plant or animal life; to damage man-made materials and structures; to bring about changes in weather or climate; or to interfere with the enjoyment of life or property." ("State of the environment," 2016). Industrialization has been a focus for the country, compared to most of the Caribbean that has focused on tourism. Manufacturing, the fuel trade, and oil refineries are some of the major causes of air pollution on the islands. Urban areas and cities are significantly more affected by air pollution compared to rural areas. This is because they are closer to the source of pollutants and many work directly in these industries that cause high amounts of pollution. This air pollution has been attributed to causing disease, "Over the past years, Trinidad has experienced a drastic increase in air pollution and non-communicable diseases, like cancer." A specific particle that is dangerous in the air is lead, which can come from gasoline and batteries. Lead poisoning and bioaccumulation is harmful to all humans, especially pregnant women and fetuses as well as young children ("Unaddressed air pollution," 2019). Older people who have health problems are also significantly more affected by lead poisoning as they have weaker immune systems. While lead poisoning is often associated with Victorian times, it is still a common element used in today's products.

Trinidad and Tobago has not completely sidelined the pollution issue, as pressure from the public is closing in. The federal government has begun to implement Multilateral Environmental Agreements (MEAs) on the island to ensure that laws and federal agreements are being made in order to protect the environment. One of many MEAs implemented is the Basel Convention, a prohibition on the movement of hazardous waste. The convention also includes preventive measures to reduce the amount of hazardous waste that is created, and measures to make sure it is disposed of properly. Keima Gardiner, Waste Management Specialist at the Ministry of Planning and Development, said that pollution should be a

concern to more people, especially the effects of said pollution, “The MEAs that deal with chemical and waste management, namely the Basel, Rotterdam and Stockholm Conventions should be of concern to locals as the chemicals and waste listed under these conventions are of international concern. They cause various public health impacts such as cancers, reproductive disorders, damage to the immune and nervous system, as well as developmental delays.” Since 2008, Trinidad and Tobago has been slowly stopping the usage of ozone-depleting substances. Trinidad has also worked with the United Nations to preserve their biodiversity and reduce pollution. They signed agreements known as the Convention on Biological Diversity and the Cartagena Protocol on Biosafety, which prevents extinction of organisms as well as preventing the destruction of ecosystems (“Pollution and MEAs,” 2021). Trinidad should be held responsible if they do not meet these agreements, and systems should be in place to make sure that the environment is being protected from pollution.

Environmental education and campaigns are crucial to getting any work done, because discussion is necessary to initiate action on these issues. . Another island country in the Caribbean, Jamaica, has created a trust that promotes education regarding the environment and natural resources. The program known as The Jamaica Environment Trust (JET) was established in 1991 and teaches schools and communities about the importance of biodiversity, and protecting the world we live in. The organization was started by concerned citizens and is a non-profit, non-governmental organization (NGO). They are funded by membership fees and donations. Their projects are mostly performed by volunteers. Just some of these projects, that could be implemented in Trinidad and Tobago, include the “Clean the Coasts Project” which partners with the Tourism Enhancement Fund to provide marine conservation themed field trips for students and teach them about the importance of the ocean and the dangers pollution poses. JET is also a part of International Coastal Cleanup Day which is the largest single-day volunteer event in the world. JET has become the national coordinators for the event and has been able to gain attraction for volunteers spreading to over 140 beaches. An offshoot of JET is Jamaicans for Clean Air and Water (JCAW) which has made fun animations about the different types of pollution in the air and water, and how pollution is harmful to both humans and animals.

In Jamaica the air and water quality is not often publicly disclosed by the government, because it can be harmful to the industries that make them the most money. JET is working towards combating this issue and wants to create more transparency. To address this issue they published “Review of the Legal and Policy Framework for Air and Water Quality in the Island of Jamaica” which discusses their issues they have had previously when they have contacted various agencies looking to access air and water quality information and the information received was often out of date, or completely inaccurate. JET proposes solutions that can be implemented through the legal system such as making standards for motor emissions since they play a significant role in air pollution and there currently are none. They also show how the legal system for protecting the environment has loopholes or gaps that needs to be addressed. An example of this, “A new Environmental Protection Order (2016) prohibits open burning in certain watershed areas, but contains no penalties.” Jamaica has similar geography to Trinidad and Tobago meaning that programs such as JET can be replicated on the island and are likely to be successful with a dedicated team and effort as well as funding contributed to the project.

Crude oil is one of the biggest polluters for Trinidad and Tobago, and contains harmful chemicals that spread throughout the water, air, soil, and eventually to living organisms. The most effective way to reduce pollution is to completely change the economy of the country. This is a difficult task, considering the history of the oil industry on the island and how many people depend on it. Moving towards renewable fuel sources such as solar, wind, and hydropower creates less pollution while also providing significant energy. Over the years the country has seen a decline in oil and gas usage and is concerned that if the oil industry fails they will be unable to have the steady income and fuel supply they rely on. Officials are also concerned on the reliance on oil the country has and have pushed for diversification of energy sources. Both solar and wind energy would be extremely effective for the islands as they receive

around 217 days of full sun each year, and they have a high average wind speed. Trinidad has begun to advertise these ideas regarding renewable energy. In 2012 a government funded campaign called “My Energy, My Responsibility” (“National Public Awareness Program,” 2012) was announced; and has been published throughout print and digital media. The focus of this campaign is to teach people where their energy comes from and how saving the environment is beneficial to humans.

One such example is their light bulb exchange initiative which promotes more energy efficient light bulbs known as CFLs and moves away from the use of incandescent bulbs. This allows everyday people to be part of the change. Similar to Jamaica's JET campaign the “My Energy, My Responsibility” campaign has outreach programs in schools to educate the young population. The major problem faced by renewable energy advocates is the politicized oil industry and the support of the government for oil (“Covid-19 and Climate Change,” 2021). The islands have a very unique location and have a large amount of biodiversity, so shifting towards ecotourism could bring in income that would be lost by stepping away from the oil industry. Changing the economy is a difficult task, but it is for the betterment of the public and the earth.

Trinidad and Tobago has been focused heavily on industrial growth, and not turned their attention towards the parallel growth in pollution. Regulations on harmful products are few, allowing carcinogens to reach the public. The economy and many people’s lives depend on the energy and oil industries, making it difficult to change the perception on how crude oil creates pollution and can be harmful. The pollution issue needs to be addressed, while also changing the economy of the country so people are able to support themselves in a way that is better for the environment and their long term health. Reducing prices for renewable energy New jobs must be created while simultaneously improving the environment. Awareness campaigns and environmental education for the public must be implemented, then governmental agreements and laws passed that protect the islands, regulate what corporations are able to do, and prevent pollution. The final most important step is to change the economy of Trinidad and Tobago, and change what most contributes to their GDP.

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