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Trinidad and Tobago, Factor 5: Climate Volatility

### **Trinidad and Tobago: The Ever Changing Climate**

Global warming is more of an issue than most people think. It is melting the ice caps, which will cause a rise in sea level. This could mean disaster for many countries. Island countries like Trinidad and Tobago are going to see a population moving inland. This is going to affect the farmland of these countries immensely. The amount of farmland in Trinidad is only around 321,236 acres out of 1,267,648 total acres. Many small farms are found on the edge of the islands, but with these rises in sea level, these lands might go underwater (Kimberly Castillo). The coastlines that are not being farmed have the major cities. These farms and cities will need to be moved, but then the question becomes, where to move them to. They will need to chop down many of the trees on the inland part of the island in order to make room for these new cities and farms. The farms will no longer have a lot of land to produce their crops or place their animals. This will be a tough problem to find a solution for when the time comes.

If these lands become flooded, farms in these countries could become rare, which will raise the prices and lower the availability of food. This may cause disaster in developing countries' economies and force people to leave. This decrease in population could be a disaster for both the developing countries and for major countries like the United States. These people that would possibly leave would affect the economy of the developing country. The economy will be affected because with these people leaving, the number of consumers will decrease which will decrease the amount of jobs needed in this developing country. With fewer jobs, the unemployment rate may skyrocket, which will also make the amount of consumers decrease. The amount of food that they would need to produce would go down, which could easily make these small farms on the islands shut down. These farmers would probably flee to the cities and will need to find jobs. Unemployment rates would increase by a lot with all of these extra people looking for jobs.

If these people leave their country, they are going to need somewhere to go. The first option for many could be the United States (Worldmark Encyclopedia of Nations). This will in turn affect our economy as a whole. With these new immigrants coming into our country, the amount of food that we will need to produce will go up greatly. Our country may not have the amount of land needed in order to support these immigrants. The availability of jobs in this country will be lowered greatly by all of these immigrants willing to work for little to no pay. As you can tell, these rises in sea level will not only affect these small island countries, but will also affect large countries. Trinidad and Tobago might be facing major problems in the future, but with our great technology we can help fix these future problems.

The average family size in Trinidad and Tobago is 3.24 people. The birth rate has only increased by 1% in approximately ten years ("Initial National Communication of the Republic of Trinidad and Tobago Under the United Nations Framework Convention on Climate Change"). Life in Trinidad and Tobago is much different than our everyday lives. The families are commonly headed by the mom. Many families have multiple generations living in the same house. In many families, the main foods used in cooking are chicken and rice. Homemade ginger beer is a popular drink there. Seafood is a common ingredient in many dishes. Around Christmas, the popular food to eat is ham, and the popular drink is eggnog with rum.

Education is a very important part of their culture. Education is free for children between the ages of 5 through 16. The literacy rate is 98%, which is one of the highest in the world (Central Intelligence Agency). All books and meals are provided to the children free of charge. Many of the families send their kids to college. There are currently 21 colleges scattered across the nation. Most of these kids get a good

education, but a chunk of them do not find jobs. Many times this leads to the selling of illegal drugs in homes to make a profit to live on.

They have one of the best health systems for developing countries around the world. There is a national health service with hospitals spread out across the country. They have two major hospitals, many small hospitals, a mental institution, and a nursing program. There are 79 physicians, 287 nurses, and 8 dentists per every 1,000 people. The most popular form of health care is actually private religious healers, who use herbs mostly.

The average farm has roughly 11 acres ("Highlights of the 2004 Agricultural Census"). The main farming practice is the small scale farm practices and selling crops to local food markets. Some of the main crops grown on these small farms are corn, rice, peas, beans, potatoes, citrus fruit, peanuts, and coffee. The main commercial crop is sugar, which is mainly grown by these small farms. Another very common crop is cocoa, which is more commonly grown by the larger farms. A huge number of people sell plantains, which are similar to bananas.

A major barrier for farm expansion is housing. With the new houses being built, the farmers are losing a lot of land. They are turning to deforestation, but it is resulting in soil erosion and problems with water runoff. These runoffs are ruining other possible farmlands; thus, the land available for agriculture is decreasing.

A huge obstacle in good nutrition is the costs. Since these farmers are unable to keep up with food demand from the growing population, costs go up due to supply and demand. The country imports food, which is cheaper, but it is not as healthy. This gives poor families food, but it does not give them the nutrition that they need.

The change in climate is affecting agriculture in a huge way there. The increasing temperatures are increasing the aridity of soils, making less crop yields. With less crop yields, the importing of food, which could have possibly been grown there, is taking place. Temperature increases also increase the number of insects and diseases. These insects and diseases affect both the crops and the population. With new people coming in from other developing countries such as Asia or South America, Trinidad and Tobago might experience new diseases, and the increasing temperatures will easily spread these new diseases. With increasing numbers of insects, the crops will be infected and possibly even killed. The farmers will have to come up with a new way to keep these insects away from the crops without using too many chemicals. The country is aware of these problems that are starting to occur with the climate change. They have implemented policies for limiting emissions of solids, liquids, and gases into the land, air, and water, started programs to make the public aware of the information regarding climate change, reviewed the strategies for national water management, and made new strategies for forestry and environmental protection ("Initial National Communication of the Republic of Trinidad and Tobago Under the United Nations Framework Convention on Climate Change").

By the year 2100, there is expected to be a rise in temperature anywhere from one to three and a half degrees celsius. The sea level is expected to rise by 15 to 95, but the rainfall is expected to drop by 15% ("Initial National Communication of the Republic of Trinidad and Tobago Under the United Nations Framework Convention on Climate Change").

These new problems are creating major issues for food production. In order to produce the same amount of food as previous years, the farmers are going to need to spend more money to find ways to help these problems. This in turn is going to cause the prices of these foods to skyrocket and become almost impossibly expensive for the average citizen. Another way that these issues could affect the production is in the sugar industry. When temperatures rise, the sugar yields decrease. The nutrition of these people is going to decrease because they are going to have to settle for buying the less expensive food with less

overall nutrition. The incomes of these farmers will rise, but they will receive less overall money due to having to spend so much on solutions to the new problems.

The status of the climate volatility is currently moderate. It has not yet reached the extreme levels that we are expecting it to. With the way it currently is, these farmers are still able to plant crops in the majority of the farmlands, but not all. This amount is just going to continue to decline as the environment is slowly being eroded each year.

The climate volatility trends in Trinidad and Tobago are actually very surprising. The annual temperature increase is currently .6 °C (Trinidad and Tobago) decreased by 36.4 mm. There has also been a constant increase in the humidity of the islands. They have a wet and dry season, but in the past few years the wet season has caused even more major flooding on the islands.

The night temperatures are rising. Scientists have noticed that on different parts of the islands, the changes have been more dramatic. The higher the altitude, the greater the change. These trends have all been measured by the meteorological office of Trinidad and Tobago. The main tools that they used to find these trends are thermometers, rain gauges, and even a hydrometer, which measures salinity of water. With the current measurements, these trends have been increasing in the past decade and are expected to continue to increase in severity. The situation for the average farm family is causing many of these small farms to stop. The change in climate is causing a rise in sea levels, which will flood out farmland and increase the amount of salt in the soil, making it almost impossible to grow crops. This salinity of the water seeping into the ground is not easy on these small farms. Their crop production is going to drastically decrease. With less amount of farmland available, these small farmers are going to have to fight for the small amount of available land.

If we can find solutions involving climate volatility in Trinidad and Tobago, their economy might continue to grow. Finding solutions keeps these farmers employed and gives more opportunities to people looking for jobs in cities. It would increase the amount of food because these farms are the leading producers of the nation's food supply. With fixing the climate problems, more farmland will become available and allow these farms to produce the needed amount of food. The quality of food will also increase because these farmers will not have to spend as much money on getting farmland because more will become available. They will also have to spend less on keeping the land salt free and above water. This extra amount of money can then be used to buy the higher quality crops to plant. The consumer families will also benefit from this because it will decrease the price of food. The environment will be preserved because these farms and cities will not have to cut down the trees in order to move inland. The economy will become stronger due to more jobs and more consumers. Women would also benefit because these jobs will need to be filled, and the women will be available to take over these positions.

There are other factors that will also come into play along with climate volatility. The urbanization in Trinidad and Tobago is reshaping the islands and land. With more urban areas showing up, less farmlands can actually be used. With these land problems, we might see an inward migration. The current destruction of the forest on the inland is polluting the soil (Geisha Kowlessar). The slight population growth is making it even more difficult for these farmers to produce a sufficient amount of food for the islands. This shortage of food will make imported food more popular.

There are many ways to help this climate change with our current technology. We can look into nanotechnology to find some of these solutions. Nanotechnology has taken a huge step to help with the problems involving greenhouse gases. They have found ways to use hydrogen fuel cells to replace the traditional hydrocarbons for energy. Using these hydrogen cells to power things across the globe might not seem like it would do much, but it would actually contribute to stopping the global warming crisis. The hydrogen for these fuel cells must be created from other sources of energy. We can get the needed

hydrogen through the sun or even wind (“Hydrogen Energy”). These hydrogen cells would work similar to electricity in order to transport energy all over the world. In the long run, these would produce much less greenhouse gases making global warming less of a problem. Nanotechnology has many more uses that could help the environment. It can be used to change the physical makeup of a product to make it withstand for a longer period of time, which will decrease the production of this product, create new insulation with more energy efficiency, decrease the weight of an object by changing its makeup, which will help with transportation, and in some cases nanoparticles can be used to replace pesticides for the fields. This technology has a lot of potential, but it is not yet cost or energy efficient (“Nanotechnology and the Environment - Potential Benefits and Sustainability Effects”). Many also say that the effects from nanotechnology could take years to actually be noticed. Today, it takes high amounts of energy to undergo the processes for nanotechnology, but if we continue to research and experiment with it, it could turn out to be one of the most valuable technologies we have ever had.

A more obvious solution is to repair roads. A bad road can make any car’s fuel economy lower and cause more emission of carbon monoxide (Biello) . Repairing these roads can help make these cars more fuel efficient and burn less fuel in addition to helping the developing countries’ economies. Buying a smart car does actually help the environment. These let off less of the harmful gases. As a world, a solution can be to continue creating these smart cars, and making them even more fuel efficient with more environmentally friendly engines.

Creating cement can cause emissions of carbon dioxide, but there are ways to reduce this. An easy fix to this problem is using more environmentally friendly fuels to heat the cement ingredients. Using as much wind, solar, or other renewable resources cuts down on the emission of these harmful gases, and it can also keep the supply of our nonrenewable resources.

We have many ways to actually grow more production with less land. Hydroponics can actually plant more crops per square acre than soil production can. The salt getting into the soil would not be a factor anymore because hydroponics does not use the soil. This will make these lands that are being flooded available to be used for food production. Using hydroponics can also lessen the emission of carbon monoxide because the big machinery will not have to be used and burn fuel. The farmers will only need to buy plastic containers and air pumps, which are pretty cheap. They filter out the salt and make the water able to be used for producing these crops.

Another example of alternative food production on less land is to produce potatoes using tires. You can stack them on top of each other with soil and roots in each tire. This will grow more potatoes using less land. To harvest these potatoes, you take out each tire and harvest each root, which isn’t very difficult.

We can use genetic engineering, we can produce plants that can survive with less space and water. We can also find ways to produce a stronger stem when it grows taller, which will allow these plants to get taller and grow more. Genetic engineering can help produce more crops per square foot and give more nutrients to the same crops by changing their genetic makeup.

Major organizations such as the UN or the World Bank should help by giving money to build these new roads in most countries. Civic organizations could give up a little bit of their own time to help build the new roads. Another thing that these civic organizations could do is help teach these people in Trinidad and Tobago new ways of farming like hydroponics.

Climate volatility is not just a factor in Trinidad and Tobago, but across the globe. Many countries could do things to help the problem. In the United States, there are many things that could be done to lessen this issue. Finding new ways to produce things in the factories without letting off so much of the harmful gases into the air, creating cars that are more fuel efficient, finding better insulation for buildings, or even just riding a bicycle every once in a while rather than driving everywhere.

Using simple solutions, such as road repairs, more complex technology, and the cooperation of a variety of organizations, we can help not only Trinidad and Tobago but our whole world. As Richard Rogers once said, “The only way forward, if we are going to improve the quality of the environment, is to get everybody involved.”

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