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Madagascar, Factor 5: Climate Volatility

Madagascar: Adapting to Erratic Weather

When one thinks of Madagascar, images of animated zoo animals may come to mind from the Madagascar movie series that has become popular over the past few years. Many people may not realize that Madagascar truly exists. However, there is, in fact, an actual country named Madagascar located off the east coast of South Africa, and it is not as picture perfect as the children's movie portrays. In reality, Madagascar is a large country that battles poverty and food insecurity. According to CIA, Madagascar's population was approximately 24,000,000 in 2015; of that number, 50% of the population lives below the poverty line ("Africa: Madagascar" n.pag). This is a shocking statistic because it means that one in two people are struggling to make enough money to feed themselves, let alone his or her family! It is difficult for Americans to imagine a country that lives in so much poverty. However, Madagascar is only one of the many countries in the world today that face extreme problems pertaining to widespread poverty, and with poverty comes the concern over food insecurity. There are many people in the world today who cannot afford to eat, and even if they had money to afford food, the lack of access to food would still restrict them from being able to obtain the nutrients they need to live a healthy life. Once again, it is hard to fathom food insecurity issues when a person from the United States can look around and see fast food restaurants offering one dollar burgers and drinks. This endless supply of food may seem to be the norm for Americans, but in other countries, food insecurity is a very real issue that needs to be resolved. In Madagascar, for example, 50% of all children under the age of five show signs of chronic malnutrition ("Madagascar" n.pag). The real question that we must ask ourselves is why are these numbers so high? How can it be that people are simultaneously starving while others are throwing away food? Something desperately needs to change so that everyone in the world has equal access to food. A basic human right of having food and proper nutrition should never be denied to anyone, no matter where they live.

The country of Madagascar is very different than the United States of America in terms of family composition, diet, and overall health. Citizens of Madagascar are known as Malagasy, just like citizens of the United States are known as Americans. Most Malagasy families are composed of a father, mother, and up to six children. According to Our Africa, it is common for families to live in only one or two rooms of a house while sharing the rest of the house with another family of the same size ("Madagascar" n.pag). With a large family comes many mouths to feed. The main staple in the Malagasy diet is rice. Rice is locally and commercially grown in Madagascar, but even this is not enough food for the citizens of Madagascar. As a result, rice needs to be shipped into the country to adequately feed everyone. That being said, rice is the main dish of every meal for Malagasy families. It is not uncommon for families to have rice three times a day for every meal ("Madagascar." N.pag). Rice is usually served with vegetables or in stews, and rice flour is used to make many types of bread. Since the average diet consists of rice and vegetables, most children do not get the nutrients they need to grow properly. Roughly 50% of all children below the age of 5 years old are stunted (IFAD n.pag). Stunting is an issue where children experience so much malnutrition that they have issues growing. While stunting is prevalent among children in Madagascar, children who are born to small scale farmers tend to be in better health because they have access to fruits and vegetables locally grown by their families ("Madagascar" n.pag). Families in urban areas do not have the easy access to food that rural farming families have because the only way for urban families to obtain food is to buy food. If the family does not have enough money, or easy access to purchase food, the family will experience food insecurity that ultimately leads to malnutrition.

Education and health care in Madagascar are also important parts to the Malagasy culture. Madagascar takes great pride in their education. This is evident because according to Maps of the World, education is

mandatory for children six through fourteen years old. There is also education available for students until they turn 18 (“Education in Madagascar.” n.pag). Since school is mandatory for eight years, it shows that education is an important part to the Malagasy culture. Respecting the importance of education is the first step in the right direction because with an education, amazing things can happen. Mandatory education is working in Madagascar since the literacy rate of the country is 68.9% (“Madagascar Education Stats.” n.pag). Another aspect of Madagascar is the country’s access to health care. Health care in Madagascar is free, but families must pay for bedding and food at hospitals (“Madagascar” n.pag). Free health care is great for families that need professional medical assistance, but there is another barrier facing the health care system. A study showed that most poor rural families have no way to get to hospitals, so they do not receive the care they require (“Madagascar” n.pag). According to Our Africa, The World Health Organization did a study that found there are approximately 3,150 doctors in Madagascar, which equates to just 1.6 physicians for every 10,000 people (“Madagascar” n.pag). This is a very low ratio that shows there needs to be more access to quality health care in Madagascar. Even though free health care is a step in the right direction, access and availability of health care is an issue that still needs to be addressed and improved.

Farming is also a very important part of the Madagascar way of life. Farming is prevalent across the country with both large commercial farmers and small scale farmers. Large-scale farmers often grow crops to sell and export from the country. According to Our Africa, large farmers grow commercial coffee and vanilla. Coffee and vanilla are among the top exports of Madagascar (“Madagascar” n.pag). While large farmers grow food to export, small farmers normally grow rice, vegetables, and fruit to feed their families. Many rural families in Madagascar are small farmers who barely grow enough food to feed themselves. Since rural farmers only produce enough food for their family to eat until the next harvest, it is a major issue when not enough food is produced to feed their family. Small scale farmers do not farm much land because they do not have any machinery and must do all the farming by hand. The average sized farm for small rural farmers is 1.3 hectares, which is equivalent to 3.2 acres (IFAD n.pag). Rice and vegetables are the main staples grown on farmers’ land. Since rice is a staple in the Malagasy diet, the main crop that is planted is rice. Rice is normally planted in bunches; however, SRI, System of Rice Intensification, is increasingly becoming more popular. SRI allows rice to be planted farther apart, which gives each plant more room and nutrients which leads to better yields (“Madagascar” n.pag). Farming is a very important way of life in Madagascar, and it is especially important because without rural farmers producing rice for their families, their families would starve.

Small rural farmers face a major barrier when it comes to successfully producing enough crops to feed their families. High yields of the farmer’s produce is needed to feed the family, so a low yield can leave a family hungry until more crops can be harvested. To add to this problem, erratic weather patterns can devastate fields leading to horrible yields. Erratic weather patterns, such as droughts, floods, and cyclones can make farming difficult for rural farmers because they do not have the resources to combat the extreme weather. According to World Wildlife Fund, about 80% of the population of Madagascar relies on subsistence farming (“Madagascar” World Wildlife n.pag). That being said, Our Africa states, about two-thirds of the population lives below the poverty line and makes less than \$1 a day (“Madagascar” n.pag). This means that when erratic weather destroys crops, poor farmers cannot afford to feed their families. Farmers count on agricultural to not only feed their own families, but to help feed others. A combination of erratic weather patterns and extreme poverty make it tremendously hard for citizens of Madagascar to achieve food security. The people of Madagascar need help in finding a way to secure their crop yields and combat the erratic weather patterns to stabilize the food supply in the country.

The unpredictable and intense weather patterns in Madagascar affect food availability and quality because farmers do not have the resources to cope with erratic weather. The erratic weather patterns that Madagascar faces are extreme droughts, flooding, and cyclones. Malagasy farmers have trouble adapting to the ever-changing weather patterns, which results in loss of crops. With unstable crop yields, poor rural

families are very food insecure because their meals depend on the crop yield. If an entire crop is destroyed, a rural family will not have enough food to eat until the next planting season comes around. Without sufficient yields, rural families cannot afford to buy food elsewhere because they do not have enough money. These families will end up facing malnutrition if they continue to lose their crop yields to erratic weather patterns year after year. Erratic weather patterns directly affect Madagascar's population and cause many citizens to experience starvation and malnutrition. The reason for this erratic weather is climate change. As Earth is heating up, weather patterns are becoming more unpredictable and devastating. Climate change is not slowing down, so erratic patterns will become even more of an issue in the future. The erratic weather patterns in Madagascar are already worsening. For example, over the last decade, farmers reported an increase in extremely dry conditions and simultaneous flooding ("Madagascar" n.pag). Farmers have already noticed an increase in erratic weather patterns, and unless something is done to slow down climate change, erratic weather patterns will only get worse. Of course, no one can control the weather, but there are other ways to improve crop yields while working around the erratic weather.

Farmers need help finding resources to combat erratic weather, raise overall crop yields, and gain better food security. Helping farmers increase crop yields will allow the Malagasy families to become more food secure in the long run. With higher yields, more food is produced, so families will be better fed and have the nutrients they need to live a healthy life. Once food security is eliminated in rural families, the farmers can look at beginning to sell their crops to urban areas. By having local farmers begin to sell their produce, the farmers will make money, and citizens in urban areas will have easier access to fresh foods. However, the first step in increasing yields is figuring out a way to combat the erratic weather. There are many different types of soil and climates throughout Madagascar ("Madagascar" n.pag). The different soil types and climate in Madagascar will make it difficult to solve food instability in Madagascar. Since there are different soil types and climates, there will not be one solution that works for the different parts of Madagascar. Different types and varieties of plants will need to be researched to see if they will work in the different regions of Madagascar. While it may be difficult to adapt to erratic weather patterns due to climate change, these are issues that need to be addressed to combat food insecurity in Madagascar.

One way to effectively address erratic weather to help improve food security in rural families is to educate farmers with information about climate change and weather patterns their region. The information that could be given to farmers would be a history on climate change, what to expect in the future pertaining to erratic weather due to climate change, and what the farmers can do to combat erratic weather to get the most out of their crop yields. Educating farmers on climate change would help the farmers gain a better understanding of what to expect from the weather in the area they farm. Since farmers cannot leave their homes to go to intensive schooling, a different type of education will be needed. A meeting every three to six months could take place throughout the country to explain to farmers the changes they should expect in the upcoming planting seasons. This class would be effective because it would inform the farmers what to expect, and what they can do to get the most out of their yields. Informing farmers on this information would also educate them on what they can do to get the best production from their crops. Also, having a meeting within this time frame would be efficient because it would not take away from their families and farms very often, yet the meetings would still be often enough to keep the farmers informed on what to expect. These meetings would be organized by the national government and local areas to insure that farmers are informed with the right information. These meetings could take place in designated spots around the country, or mobile classrooms could be built. Mobile classrooms would be effective because there would not have to be designated spots for farmers to meet; instead the classroom would be brought to the farmers. There would be jobs created within the national government to help plan these meetings, and jobs would be created for teachers to share the information with the Malagasy farmers. The classes would not only educate farmers, but also create new jobs for citizens to help organize the information to give to the farmers.

In addition, these classes would be used to educate Malagasy farmers on GMOs. According to UNEP, Madagascar does not allow GMOs due to health and environmental concerns (“GM Food Aid” n.pag). However, these classes would provide a prime opportunity to teach the Malagasy people that GMOs are not bad, and can, in fact, help the farmers produce better yields. If the Malagasy government and people know about how GMOs are not bad and can help, they might become more receptive in allowing GMOs to be planted. However, if the Malagasy government and citizens are not immediately receptive to the idea of GMOs, there is another solution. This solution is to introduce better drought and stress resistant crops to the Malagasy farmers. By planting crops that can better withstand the extreme weather, the yields of the crops would improve significantly. Improved crop yields would improve food security in rural farmers throughout the country. Crops that can withstand extreme weather would be used to handle the erratic weather in Madagascar and produce more food for the farmers and their families by increasing yields. A way to work around the country’s ban on GMOs is to research naturally occurring genetic events that have lead to certain breeds of plants that are more stress resistant and introduce these varieties’ to the country’s farmers. If there is a strain of rice that has become stress resistant through natural evolution, it would work in Madagascar because it has not been genetically modified in a lab, but instead has adapted through time. This would be more difficult than importing GMOs, but the extra work would be worthwhile as it would drastically improve crop yields and food security.

The final, and possibly the most effective solution is cell phones. Ending world hunger with cell phones seems extremely far-fetched and too simple. Nonetheless, Madagascar’s battle with erratic weather could be helped with cell phones. In fact, according to Yue Wang, basic cell phones are very prevalent in third-world countries, and a family is more likely to own a cell phone than a fully-functioning toilet (Wang n.pag). Madagascar is one of the many countries that has embraced the cell phone era. This could come as an advantage to the food insecurity issue that is ravaging the country. Take for example what is taking place in Pakistan; according to Grace Dobush, “USAID Pakistan teamed up with local government and a local mobile carrier to create a mobile program that sends peach and potato farmers text or voice messages about crop prices, market access, and disease prevention” (Dobush n.pag). This could be an example for what could take place in Madagascar. Having Madagascar’s government partner with the large mobile phone companies in Madagascar, Airtel and Orange Madagascar, an international weather organization could send out text message alerts or calls to inform the Malagasy farmers of the expected weather forecasts (“Madagascar Mobile Operators” n.pag). The government would work with the phone companies to develop a system to provide farmers of weather forecasts. International weather satellites and companies would also be needed to accurately analyze Madagascar’s weather and send precise weather information to the Malagasy farmers. This could help the farmers prepare for flooding, droughts, or cyclones in the area. By knowing ahead of time what to expect from the upcoming weather, be it a day, a week, or a month ahead of time, the farmers could take extra precautions to secure their crops. These weather updates could consist of everything from weekly weather predictions to drought/flooding warning for the entire planting season. The weather updates would be provide by international weather companies that have analyzed Madagascar’s weather history and use weather predictions to determine what weather information will be sent to the Malagasy farmers. The locals could work together to spread news of upcoming weather with everyone in the community, so farmers who do not have access to phones could stay informed on what to expect, and the precautions farmers need to take to protect their crops. The citizens of Madagascar will play a large role in this solution. The Malagasy farmers will need to be receptive of this new solution of cell phone to update them on upcoming weather patterns and predictions. Also, if they know a nearby neighbor that does not have access to a cell phone, the farmers will need to take the duty upon themselves to help out their fellow citizen and share the weather forecasts. With the cooperation of the Malagasy farmers, cell phones could be effective in helping increase yields and decrease crop loss due to erratic weather.

Overall, Madagascar is a country that deals with erratic weather patterns that affect food productivity. Cyclones, droughts, and flooding are prevalent across Madagascar, and these erratic weather patterns can devastate Malagasy farmer's already small crop yields. This climate volatility is very difficult to predict and has huge financial and health implications yearly. In countries like Madagascar, climate volatility has a strong impact on poverty levels because most farmers in Madagascar practice subsistence farming. This means that when the farmer's crops are destroyed, the farmers and their families do not have any money to go and purchase food. I have addressed many different solutions to help overcome this factor, climate volatility, which has been affecting Madagascar's population. Droughts, floods, and cyclones are very prevalent over the entire country, and farmers do not have the resources they need to properly combat these weather events. To the small farmers that farm less than 1.3 hectares, erratic weather destroying a crop is devastating. When an entire harvest is lost or damaged due to erratic weather patterns, the farmer's family does not have enough food to eat an adequate diet and may become food insecure until the next harvest. So how do we solve such a large issue? While controlling weather is not an option, there are ways to work around the uncontrollable weather patterns. The government can offer educational meetings for farmers to discuss climate change and upcoming weather patterns. In these meetings, GMOs can be addressed to inform Malagasy farmers on how GMOs can help improve their yields. While it may take a bit for the people of Madagascar to accept the idea of using GMOs, other stress resistant crops can be developed. Introducing stress resistant crops that can better withstand the erratic weather Madagascar experiences could help improve food security. Furthermore, international companies could reach out to citizens through their cell phones by sending updates on upcoming weather predictions. The farmers of Madagascar would then use these weather predictions to prepare and protect their farms for the upcoming season. Working toward improving food security in Madagascar is a very important step in the right direction because every person on this planet deserves to never have to worry about where their next meal is coming from. As Dr. Norman Borlaug once said, "Food is the moral right of all who are born into this world."

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