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Madagascar, Food Insecurity

Madagascar: Famine Realities and Solutions.

The nation of Madagascar is known for its beautiful and unique biodiversity and has always been a treasure of Africa. Currently, that treasure may be at risk, Madagascar is going through a devastating famine and has been since late spring 2021. This is the first-ever recorded famine caused solely by climate change and global warming in the modern world.

Madagascar is known for its colorful flora and fauna. Its environment is rich with unique exotic plants and animals. Plants include the Madagascar Periwinkle, the Bismarck palm, the octopus tree, and Darwin's orchid. Madagascar had a diverse ecosystem and a tropical maritime climate that is influenced by altitude, the monsoons and proximity to the sea. The highlands have a temperate climate with warm, rainy weather from mid-September to April and cooler temperatures from May to early September. Madagascar has flatlands, plains, desert plains, desert hills, rainforests, wetlands, and tropical forests. These biomes support a wide variety of animals. Insects include a gigantic variety of moths, butterflies, spiders, and snails. Mammals include many types of lemurs, panthers, aye-ayes, fossa's, and golden moles. Reptiles and amphibians include day geckos, chameleons, snakes, turtles, frogs, toads, fish, and tortoises.

Madagascar is not a wealthy country. Madagascar's economy supports employment in farming, fishing, import/export of crops, and forestry. Many of these jobs have substandard employee rights and conditions. Many families live paycheck to paycheck. Madagascar's economy is ranked 119th in the world. Madagascar's strongest economic factor is farming supported by its fertile soils.

The population of Madagascar is twenty-seven million. The average Madagascar family has four to six people, and the average house has two to three bedrooms. Most households are overcrowded - if the family can even support a household financially. Seventy-five percent of Madagascar's population is living on only 1.90 USD per day which is considered severe poverty. A family's diet relies heavily on farming and crops. Most families rarely eat meat as it is too expensive and prefer most vegetarian-based meals except fish and occasional poultry. Only forty-two percent of families have access to clean drinking water. Madagascar families also face barriers in access to electricity, food, and healthcare. Madagascar is ranked 125th in the world in education. Most children are taught to read at home or school from six to fourteen before beginning work. Issues related to education are late entry and dropouts.

A famine is classified as "A natural disaster, such as a long period of drought, flooding, extreme cold, typhoons, insect infestations, or plant disease," (National Geographic, 2019) Most famines in history have been caused by drought - which not only causes water shortages but also causes crop shortages which result in little affordable food being produced. Drought famines also cause severe hygiene issues because people would rather drink any water available rather than clean with it. Famines can be caused by natural disasters such as hurricanes, monsoons, tornadoes, tycoons, etc. These natural disasters destroy crops and food industries, as well as devastate livestock and cattle populations. Other famines can be caused by widespread plant disease. These plant diseases can be caused by pests, improper growing methods, or pathogens. However, none of the above famines are taking place in Madagascar.

" Madagascar is experiencing the first-ever recorded famine caused solely by climate change and global warming, in the modern world." (Baker, 2021) No other case of this has been reported and if Madagascar is already experiencing this, other countries will follow. The southern region of Madagascar had been hit with successive years of severe drought and it is estimated that more than one million people have suffered

from food insecurity. Madagascar has been vulnerable to natural disasters, which have routinely plagued different regions of the country and has drastically affected the food situation of varying parts of the population. “ Over the past thirty-five years more than fifty natural disasters have struck the country; cyclones, droughts, floods, and locust infestations have affected over half the population. These natural disasters have in turn led to epidemics, including malaria, and food shortages.” (Working in Crisis, 2016) Malnutrition was noted by UNICEF in Madagascar as early as 2020, with forty-two percent of children under five suffering from malnutrition. Madagascar's southern region has been suffering from the worst drought in forty years by June 2021. “The southern part of the island nation of Madagascar, off the east coast of Africa, is experiencing its worst drought in four decades, with the World Food Program (WFP) warning recently that 1.14 million people are food-insecure and 400,000 people are headed for famine.” (Baker,2021) The situation worsens since many of the people in the region are smallholder farmers and depend on their own agriculture and homegrown food. The UN World Food Programme (WFP) chief David Beasley warned that the region is facing a "catastrophic" hunger crisis and asked for 78.6 million dollars in immediate assistance in June 2021.

To support the peoples of Madagascar it will be necessary to provide solutions both immediate and longer term. With the almost total disappearance of food sources and clean water in Madagascar, the nations and relief organizations of the world will have to step in immediately. “ Conditions are likely to continue deteriorating in the coming months. Nearly 1.6 million people — approximately 60 percent of southern Madagascar's population — will likely require humanitarian assistance from June 2021 to May 2022.” (Madagascar, 2021)

The smallholder farmers of Madagascar live precariously and are vulnerable to any shocks that affect agriculture. These vulnerabilities include any reduction in crop productivity as most farmers are already food insecure. The remoteness of farm villages and road infrastructure in Madagascar make problems worse as farmers are not capable of getting their harvest to market or obtain important supplies.

An intermediate solution would be to provide farmer extension services to provide technical support and training to increase agricultural productivity. These extension services could provide technical information and training on the best management practices for planting, harvesting and crop storage. These extension services could be effective with action-oriented plans jointly identified and developed with farmers and communicated throughout Madagascar. The “Rural Capacity Building Project” in Ethiopia has relied on extension services that has boosted economic participation in households and expanded land area cultivated alongside the adoption of marketable crops.

Low-cost opportunities in small-scale infrastructure, such as improved irrigation systems and crop storage facilities can help Madagascar farmers boost productivity and protect their harvests. Small grants and credit to farmers would support those initiatives. An example of these low-cost opportunities is the SCAMPIS project initiated in Madagascar in 2012. The SCAMPIS project designed and distributed micro-irrigation kits at a low cost to farmers.

Micro-irrigation has also led to higher yields and improved quality in terms of the sanitation of the products grown. Drip irrigation has reduced water consumption as well as harmful effects such as the leaching of fertilizing elements from the soil, soil compaction, disease, etc. After observing the families who had already begun using these kits, it became clear that this technique makes it possible to irrigate a surface area five to six times larger using the same quantity of water. The technique was also observed to help the smallholders increase their profit by anywhere from 70% to more than 200%, depending on what they were growing. (Micro-Irrigation, 2021)

These micro irrigation projects are particularly appropriate as these projects will both save water and deliver needed moisture directly to crops. The lower cost options such as micro irrigation and planting trees in crescent shaped troughs to hold moisture and prevent erosion can be scaled across Madagascar immediately. These smaller community projects could be implemented with government invested training programs initiated throughout Madagascar. Larger irrigation and water conservation projects such as dams, canals, and reservoirs will need to be supported from large international aid organizations such as the World Bank.

A priority for Madagascar is to safeguard their natural ecosystems that smallholder farmers use as safety nets. Forests, wetlands, rivers, and other natural areas provide services to the farmers, including the provisions of firewood, charcoal, water, wild yams, and materials for house construction. These services are important year-round and particularly following catastrophic events when farmers turn to the forests for food and materials to rebuild their damaged homes. An example of quick action and new technology is the reseeded of forests decimated by fires in California. “Conservationists on the California-Nevada border are experimenting with a new way to try to revive forests devastated by wildfires: by using drones to rain pods of nutrients, soil, and pine seeds over the ravaged landscapes.” (Drones, 2021) The best way to generate payment for these pods is to use social media as much as possible and take any donations, since the situation is extreme enough the Red Cross can get involved to help cover costs and provide volunteers to actually fly the helicopters. These seed pods could be altered to include different seeds or eggs for the forested areas or close to streams or rivers. I believe this idea could revolutionize famine and natural disaster recovery as we know it.

The Madagascar government to protect their natural resources must step up efforts to prevent illegal mining and the trafficking and destruction of precious forest lands. The development, conservation, and management of protected areas would help to alleviate the destruction of critical areas. The government must include environmental impacts on all infrastructure projects. These protected land initiatives should be both developed and enforced by local authorities that balance the needs of the local community and protect the resources.

A longer-term solution for Madagascar is one of diversifying crops that are grown using climate smart permaculture and agroforestry. Trees for the Future (TREES) an international development organization has implemented agroforestry and regenerative agriculture training to help smallholder farmers in Tanzania and Senegal since 2014. “Since then, Trees for the Future has helped more than 73,000 people revitalize their lands and achieve food and income security. TREES saw farmers’ food insecurity rates drop by 33 percent and dietary diversity scores improve by 44 percent.” (Cobb, 2020) The forest garden approach teaches families to protect, diversify, and optimize their land by planting fast-growing trees Smallholder farmers plant a wall of trees around their farm. Where livestock roam free much of the year, living fences provide a free and renewable barrier to herding animals as well as harsh winds. Once land is protected, soil improves, and farmers can plant a variety of crops.

Another important and longer-term solution is to improve the rural road system in Madagascar. In Afghanistan, USAID (2006) rehabilitated forty-nine rural road segments within their Rebuilding Agricultural Markets Program (RAMP). An effect of this program was that the volume of net surplus exported from the treated villages increased, farmers got better prices for their products as they were able to transport their products to main markets and sell at competitive prices. “Research had found that opportunities for commercialization of agriculture within the zone of influence were far better with rehabilitation of the roads. Observations during the survey and PRA interactions

with local informants indicate that the roads have also improved access to people traveling to district agriculture departments and medical centers.” (Sieber, 2020) **Madagascar will continue to benefit from the continued aid and technical support from the USAID organization. USAID has reforested thousands of hectares and has rehabilitated thousands of kilometers of rural feeder roads to improve access to markets and social services and has restored networks of irrigation canals that feed large tracts of farmland.**

Madagascar has some of the richest and most diverse flora and fauna of any other country. But the gorgeous country has unfortunately been struck with a devastating famine that the already poor country cannot recover from without help. Providing immediate resources to sustain the Madagascar people is a priority. Developing and implementing intermediate and long-term agricultural projects that build resilience against future destructive weather events should also be a priority.

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