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Madagascar: Addressing Malnutrition through Education

Life is difficult for thousands of people. Sadly, those that are better off than others seem to complain the most about their lives. Many Americans are guilty of this action when the reality is we are offered a great life-especially when compared to residents of Madagascar, Africa. In Madagascar, the average person makes around \$1U.S. a day in which to support his or her family, but four-fifths of the population survives on less ("Why Is Madagascar so Poor?", "MADAGASCAR: Stunted Children Means Stunted Lives."). Families tend to have at least 10 members, who may be supported on around \$10 US per month. Others, if they are lucky enough, may receive a once monthly payment of \$15 US after working ten days on a sisal plantation, thus giving a ten-person family approximately \$0.50 to live on daily without savings ("MADAGASCAR: Poverty and Malnutrition on Sisal Plantations"). The average family will spend 74% of their income on food ("MADAGASCAR: Stunted Children Means Stunted Lives"). In addition to having low income rates, Malagasy also have very large families as a result of men having numerous sexual partners. In Madagascar, men are considered wealthy by the number of children they have fathered, thus creating many single mothers raising large families ("MADAGASCAR: Poverty and Malnutrition on Sisal Plantations"). These large families are fed on an almost exclusive rice diet. One Malagasy resident will consume an average of 102 kilograms, or about 26 pounds, of rice in a year ("MADAGASCAR: The "Less Is More" Philosophy of Rice Production."). Consuming such an annual amount of rice does not seem that bad, but when broken down into the amount consumed daily, it is discovered otherwise. For example, only 0.07 pounds, or 1.12 ounces, is eaten daily, and only one small bowl at night may suffice because of the growing rice shortage ("MADAGASCAR: Stunted Children Means Stunted Lives"). Many Malagasy will resort to consuming seed and tamarind mixed with ash just to ease their hunger pains ("Poverty Sparks Malnutrition in Madagascar"). Additionally, over 59% of the Malagasy population drinks from unsanitary sources because there is very limited access to safe water. If a Malagasy should get sick, he or she may not receive treatment because there are only 0.161 physicians and 0.3 hospital beds for every 1,000 people in the population of Madagascar (*CIA-The World Factbook*). Also, many of the residents live without the conveniences of electricity, transportation, suitable housing, and clean water because they are hard to acquire. Additionally, their houses may be built from handmade wood-fired bricks or mud and bricks, both with thatched roofs and dirt floors. Also, in order to travel, one will walk or take ox-carts to places such as the market, where most goods are bought and sold ("WBUR.ORG Presents Madagascar"). Finally, of the families that have farm land, the average size is 1.3 hecta-acres, on which subsistence farming with rice and few vegetables is practiced ("Rural Poverty in Madagascar"). To take care of the small farm plot, hand-forged shovels, zebu-pulled plows, and rusty machetes are used ("WBUR.ORG Presents Madagascar"). Unfortunately, many do not have farm land from which to earn income. Instead, the family will buy and resell items from the market just to get by. Sometimes, buying items for resale is not an option though (*UNICEF*). Food may be unavailable in more unstable, food production times such as the "lean" season. The "lean" season is an annual time period lasting from October to March. During this time, even less food is received and severe droughts or flooding damage result, thus killing off major food sources, like rice ("Poverty Sparks Malnutrition in Madagascar"). Without major food sources, sanitary water, medical care, and a decent economy, very high malnutrition rates result for Malagasy people.

Over seventy-five percent of the residents of Madagascar live below the poverty line due to many problems ("MADAGASCAR: The "Less Is More" Philosophy of Rice Production"). (This lifestyle below the poverty line is a result of many problems.) Madagascar is geographically isolated, which increases the cost of trade. Also, there are less than twenty million people that compose the very small, poor

population. Lack of investment from foreigners and other surrounding countries has further stunted the already poor economy ("Why Is Madagascar so Poor?"). Examples of the battered economy are shown all throughout the country. For example, many bridges are in danger of collapsing or have already collapsed ("Why Is Madagascar so Poor?"; "WBUR.ORG Presents Madagascar"). Also, only 5,780 kilometers of roads of the 49,827 kilometers of roads in Madagascar are paved. Even the paved roads are in devastating shape. Many of these roads are riddled with potholes, or are only wide enough for a single vehicle ("Why Is Madagascar so Poor?"). The poor economy has also taken a toll on Madagascar's educational systems as well. Most children, adolescents, and adults know nothing of the nutritional needs of their bodies. Because they lack the knowledge of nutrition, many have a significant lack of minerals and vitamins in their diet as a result. Malagasy people do not know about the seven dietary food groups. They consume rice as their main food source and are rarely able to consume foods from the other food groups ("MADAGASCAR: Stunted Children Means Stunted Lives"). Sweet potatoes can only be eaten as soon as they're dug up. Also, chickens are believed to be dirty and therefore are not eaten. Their eggs are believed to make children and women mute, and are therefore not eaten as well ("Poverty Sparks Malnutrition in Madagascar"). Because they are not eating properly, Malagasy people are severely stunting their growth and lives ("MADAGASCAR: Stunted Children Means Stunted Lives", "WBUR.ORG Presents Madagascar").

Madagascar ranks sixth out of all countries with high malnutrition rates ("MADAGASCAR: Stunted Children Means Stunted Lives"). Two out of three residents of Madagascar live in poverty, and fifty percent of children five years old and younger have stunted growth that is malnutrition-linked ("MADAGASCAR: Poverty and Malnutrition on Sisal Plantations"). Malnutrition slows the maturity process. Many women in Madagascar are already pregnant before they ever reach their full growth potential, which in turn leads to underweight babies. The babies become more and more undernourished because they are not breastfed like most should be ("MADAGASCAR: Stunted Children Means Stunted Lives"). The first two years of a child's life are crucial when it comes to nourishment, but because Malagasy women must often supply food and income for the household, many babies are not even breastfed for the first six months because the women must return to work ("Poverty Sparks Malnutrition in Madagascar.", "MADAGASCAR: Stunted Children Means Stunted Lives."). These women are not educated as to what can and cannot be fed to a baby, so mothers will give their babies coffee or tea as a supplement for breast milk ("MADAGASCAR: Stunted Children Means Stunted Lives."). If malnutrition can be stopped in Madagascar, its residents will not only have longer, healthier lives, but they also will be able to earn more money to build a better lifestyle for themselves. First, they must learn what foods should be consumed and what should be grown. After learning what foods should be eaten, Malagasy also must learn different ways to adapt their crops to weather conditions. Then, they need to learn new methods of growing food and how their food crops can be protected and preserved to last longer. Finally, they must be taught how to keep food and water sources sanitary.

In order to educate Malagasy of malnutrition dangers and also treat malnourished people, UNICEF and the National Community Nutrition Program have 5,550 nutrition sites across Madagascar to help starving, malnourished families. The World Bank has also donated \$10 million for helping with nutrition programs. Children of all ages are brought in to be treated ("Resources For"). By measuring arm and head circumferences of children, and weighing them, the severity of a child's malnourishment can be determined ("MADAGASCAR: Poverty and Malnutrition on Sisal Plantations" "Plumpy'doz Distribution Fights Malnutrition in Madagascar's Remote South"). At these locations, the mothers also are taught about ways to promote healthier lifestyles for their children ("Resources For"). Many do not know that rice alone is not good nutrition. Mothers are taught how fruits and vegetables can be grown at very little cost and added into other foods to increase their children's weight. Also, they are taught to eat from three food groups ("MADAGASCAR: Stunted Children Means Stunted Lives"). By slowly breaking down food items into categories, changing old habits will seem less stressful and much easier to do, because a little change is brought about at a time. Also, optional cooking classes are offered to help teach Malagasy

women about creating a balanced meal. After the class had finished cooking, the women sell the food to others in need. Fortunately, all of the vegetables used in the classes are grown in a community garden, which lessens monetary tensions on families. Sometimes women will bring in cooking utensils and pans, but never food. For families that are really struggling at home, vegetables can be requested from the garden for their own personal use ("Resources For").

Children in UNICEF nutrition sites may be kept at the site until they reach a certain weight. The weight that any given child must reach depends on each child's individual circumstances. The weight that must be obtained will vary with the child's height and other health issues. Some of the children at these sites are given nutritional foods to take home to help increase their weight, while others with more severe malnutrition cases, are required to stay for periods of time. Children with severe malnutrition issues are sent to the Centre for Treatment of Acute Malnutrition without Complications (CRENAS). While children who have other complications or have more severe cases of malnutrition are sent to the Centre for Treatment of Acute Malnutrition with Complications (CRENI). These children, among other children at other nutrition sites are given two main nutritional or therapeutic foods ("Poverty Sparks Malnutrition in Madagascar").

One of the nutritional foods that may be received is Plumpy'doz®. This product is a ready-to-use supplementary food given to children during the lean-season or to those who may not yet be showing signs of malnutrition. A recommended dose for children is three teaspoonfuls, three times daily. Plumpy'doz® is adapted for the nutritional needs of children ages six to twenty-four months, but it is used in malnutrition cases in children six to thirty-six months of age. Plumpy'doz® contains added micronutrients, high quality proteins, and essential fatty acids to help reduce the risk of malnutrition in children, and lower the severity of one's case ("Plumpy'doz® Nutritional Supplement for the Growing Child"). Another food that may be administered is Plumpy'nut®. The dietary ready-to-use therapeutic food is used for the rehabilitation of children suffering from severe cases of acute malnutrition. This product is used to increase a child's weight until he or she reaches a set, healthier, target weight. Usually a child reaches his or her target weight in approximately six to eight weeks. The recommended dose for Plumpy'nut® in children is one carton daily. Many times, children are given Plumpy'nut® to take home. This therapeutic food is used in a large age range of people. Children six months old may receive it, as well as adults. Plumpy'nut® contains peanut-based paste (with sugar), vegetable fat, skimmed milk powder, and added minerals and vitamins and is consumable straight from the package ("Products: Plumpy'nut"). Both Plumpy'nut® and Plumpy'doz® are used alongside other foods (*UNICEF*). These supplements fill in for the minerals and vitamins missing in a Malagasy child's regular diet while their mothers are learning of ways to increase the nutrition of their children ("Plumpy'doz® Nutritional Supplement for the Growing Child", "Products: Plumpy'nut"). In order to lower rates of malnutrition in Madagascar, both of the supplemental foods need to continue to be used. Additionally, more community gardens need to be set up. If the community works side-by-side to create a garden, the work will go much quicker. Also, if every Malagasy person is working together for a goal, then it can be reached sooner and more effectively. Furthermore, the group work will create a sense on unity within the nation. Instead of one person feeling like he or she is trying to change for the better, the entire country would be doing so together and supporting one another when times seem tough. By having more community gardens, groups can work together using foods from their home and the community garden to cook much bigger meals that could feed more people. Community gardens are only present at nutritional sites. One good-sized community garden needs to be present in each community. Unfortunately, there is not a community garden within each community because nutritional sites that help to create and care for the gardens are not present within each community. Lastly, with people working together, there is more support given. Life may not seem so hopeless on days that it normally would have. Families can offer ideas to one another about what to eat, meals to make, and how to grow foods. In this event, groups of people can benefit from one another when they try an idea that was not known to them before, but works well. Not every family

that visits the nutrition centers will receive the same information about useful nutrition ideas, but when groups come together, ideas are shared.

Another idea that would greatly help Malagasy farmers is using the System of Rice Intensification, or SRI. SRI farming is completely organic, so it eliminates the cost of fertilizer and pesticide costs. It could also be sold to other countries at a higher cost because it is organic ("OPERATION SRI MADAGASCAR"). The basics of using SRI are simple. Seedlings of rice plants are transplanted carefully and quickly at a very young age to widely spaced hills. Only one plant is placed at each hill. Normally the plants are about eight to twelve days old when the move occurs. At the plants' new location, the soil is kept moist, but not flooded, and a minimum amount of water is applied when needed. Malagasy farmers believe that if they put more rice plants in a field, they will have a larger harvest. This is not true though. Rice production has declined because farmers are reducing their harvest by planting too many plants within fields and flooding them. Contrary to original belief, rice plants are not water plants. Rice production is decreasing, which is extremely dangerous because it is the main source of food for Malagasy people. In 2010, 4.7 million tons were produced, but that amount had declined to 4.3 million tons by 2011. With an annual three percent population growth and declining food sources, there are even more hungry mouths to feed. The availability of rice is declining because farmers are using old production habits. Madagascar used to be a rice exporter, but with declining production rates, Madagascar has now become a rice importer. In order to stop the process of traditional rice planting and halt Malagasy rice imports, rice farmers must learn a more efficient way of producing their crop. For a farmer that doesn't use the SRI method or rice production, rice fields would be flooded and many, many plants would be planted in a single field. This method has become outdated. By using the SRI method, twenty-five to fifty percent more water is saved because fields are not flooded. Also, eighty to ninety percent fewer seeds are used because fewer plants are crowded into a field. In many cases, the amount of rice that is harvestable doubled or even tripled by using the SRI method. Unfortunately, many farmers are skeptical of this new method. They believe that the rice should be planted the same way that it always has been previously ("MADAGASCAR: The "Less Is More" Philosophy of Rice Production"). Few farmers are willing to try to this method although Malagasy people are offered help on getting started with SRI and have been shown the results of using SRI rice production by groups such as TEFY SAINA (ATS), the Zoma Association, Champ-Ecole, TAF, TATA, Taoezaka I, Taoezaka II, and the Laulanie Green University. These groups offer agricultural training courses; train new farmers; provide examples of how to use SRI and other agriculturally efficient ideas; welcome and train tourists; raise earthworms; specialize in supplying and inventing cheap equipment; training in alternative medicine, cooking, canning, nutrition, SRI, etc; and offer SRI "training for trainers," respectively. Many Malagasy residents, who have seen System of Rice Intensification's effects, received their experience through one of the SRI endorsing groups ("OPERATION SRI MADAGASCAR"). Adversely, many of these same residents now hoard the new method to themselves, and don't share the great outcomes they've encountered with it ("SRI News").

As demonstrated all throughout the country of Madagascar, malnutrition is a major problem. Malagasy people must learn what they need to eat in order to live a healthy life, but this is a very hard issue to address in a country with a very poor, unstable economy and three percent annual population growth. Tackling malnutrition, an unstable economy, and food production all at once can seem to be an almost overwhelming issue. By making changes little by little, an enormous impact can be made. Organizations that currently feed and take care of malnutrition in Madagascar, such as UNICEF, need to continue to do so, but they also need to address community garden issues and farming techniques. More community gardens need to be present. In order to do so, UNICEF needs to have more nutrition sites available and organizations should schedule group meetings to bring people together. The Malagasy need to be educated on what is good to eat and grow. By bouncing ideas from workers of nutritional sites and the people of Madagascar, even greater ideas can be created to increase food production and implement community gardens. Each person can offer ideas on what to try or what works best in his or her opinion.

Though learning together, a person will feel more comfortable in trying new things. It would seem more like a group project and effort, instead of just a single person or family feeling like they were picked out to be told to try something better. Furthermore, if people of a community begin to work together in free time, they may learn more about different ways of providing nutrition to their children in a more efficient way or cheaper cost. With a community garden, families can help one another out in more pressed times, and children will not have to wait until late at night to get their only meal for the day. The families will be able to support one another in making the changes to their diet, as well as borrow ideas as to what kinds of foods would qualify under the three different groups that they must learn to eat from. After this is implemented, nutritional workers can slowly further breakdown the three food groups into the seven that we Americans know, so that Malagasy will know what food groups should be eaten from and how much to increase the nutrition in their diet even more so-but the change must be done slowly. If everything is pushed and rushed on the country at once, people will feel overwhelmed and resort to relying on their old habits even more. Furthermore, people need to be shown the advantages that SRI rice production has to offer, and then the method could be implemented within a community garden for each residential area. Then, many people are able to see the results and work together to achieve them. The Malagasy residents that try to keep SRI farming to themselves, need to be show how using the method across the country could stimulate their economy into better times, and also create the country to become a rice exporter again. Many groups endorse the usage of SRI Farming, and now even the President of Madagascar is stating that the System of Rice Intensification is an important key to his newly announced “natural revolution” (“MADAGASCAR: SRI IS ENDORSED IN U.N. GENERAL ASSEMBLY BY PRESIDENT”). UNICEF and the SRI endorsing groups need to collaborate in order to end malnutrition. If the SRI endorsing groups could raise money or receive donations for rice plants in the UNICEF community gardens, the results that SRI has to offer would be shown greatly. In order for the results to be seen, the Malagasy people would have to be involved with the up-keep of the gardens at least weekly. A rotation schedule could be implemented in which groups of people had specific days on which they were to be involved with the garden upkeep. Afterwards, the results of their hard work could be shared at a community meal. If this does not work, then a law may have to be made requiring families to plant half of a hecta-acre of their land using the SRI method, if community gardens cannot be in every almost community. Then the results and growth differences between the two methods can be compared on a daily basis by the farmers. All changes must be brought about slowly though. Overtime, more and more changes can be implemented, but not all at once. In a country that has suffered from a poor economy, malnutrition, high disease rates and infant deaths, and also has a large annual population growth- multiple changes would seem overwhelming and leave the residents even less trusting to change from old habits. Baby steps are the key to the end of Malagasy malnutrition.

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