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 Madagascar, Factor 6: Sustainable Agriculture

### **Madagascar: Ending Deforestation and Promoting Sustainable Agricultural Practices**

Picture this: You wake up as a seven-year-old in rural Madagascar, an island about twice the size of Arizona off the coast of southeast Africa. You stretch and look around, finding yourself in a small mud and bamboo shack. Around you in this small room, by the sunlight trickling in through the cracks in the walls, you see your five siblings waking up with you. In the only other room in the shack, your parents, or parent, are already awake. Your stomach growls, but you know better than to complain. You were lucky to make it to your seventh birthday. As you go throughout your day, it is nothing like that of a child on the other side of the world. Since your family is so poor, you do not go to school, so you cannot read. Instead, you might help your father on the “family farm.” Your “family farm,” of course, is not actually your family’s farm, but instead your “family’s acre,” or an acre of forest that you have cut down and burned that you are now growing rice on for a year or two until it is drained of its ability to sustain agricultural productivity. You eat rice with every meal and have been lucky to taste meat a few times in your life. Next year at this time, you will be farming a different acre of forest because this one will be dry of nutrients and left for waste.

This situation is not uncommon in Madagascar. Life is difficult, especially as a farmer. The land of Madagascar is both mountainous and flat, which makes some parts particularly difficult to farm. As Norman Borlaug said, “Civilization as it is known today could not have evolved, nor can it survive, without an adequate food supply.” With that in mind, there is a high chance that the 21.3 million people in Madagascar will soon be without a food supply whatsoever. Due to traditional, unsustainable agricultural practices, much of the land in Madagascar is being completely destroyed. Deforestation is a major problem, and it leads to bigger problems such as erosion, desertification, and water supply issues, especially on hillsides and slopes. In fact, according to Clark, author of an article found in *Global Majority E-Journal*, the population has been growing in Madagascar, which makes even more mouths to feed. Farmers, in an attempt to feed the population, have been destroying the forest and practicing unsustainable agriculture. This has grown into a large issue (61).

According to an informational website, the typical family in Madagascar is very large; the average set of parents have six children (Our Africa). It is not common for all six children to survive, and if they do, they are lucky. The Our Africa website states, “62 children in every 1,000 are likely to die before 5 years.” Clark cited information from a study the World Bank published in 2011 saying, “. . . 68 percent of Madagascar’s population lived below \$1.25-a-day and 90 percent of Madagascar’s population lived below \$2-a-day” (63). So although the children are alive, they are in for a life filled with struggle. In addition, the children would be fortunate to have both parents. 10.6 million people, or almost half of the population, are under the age of 18, and almost one million of them have lost at least one parent (Our Africa).

The diet of the typical person of Madagascar is usually inadequate. Rice and cassava, a starchy tuberous tree root grown in tropical areas, make up the majority of the meals. They can make rice into a variety of dishes including bread, pudding, and sweets. It is also served with stew, meat, beans, or vegetables when the families have access to this type of food (Our Africa). If farmers are fortunate enough to have cattle, the prized breed of Madagascar is the Zebu hump-backed cow. The milk from the Zebu is important to the families’ diets, but they save the meat for special occasions only (Our Africa). When the families live on the coastline, fish and coconuts make up a large portion of their diets. Also according to Our Africa, because of poor diet, Madagascar has one of the highest stunting rates in the world.

Because of low income and inadequate diets, “49.2% of children below 5 years are stunted” (Our Africa). As a result of the given conditions, the health of the children in Madagascar is horrible. The families do not have a lot of money, and “often households are too poor to have meat or fish regularly, or to buy fresh fruit and vegetables. This means that many children are not eating the kinds of food they need for proper growth” (Our Africa). This inadequate nutrition contributes to the children’s lack of health. It is evident that health care is poor. There are few doctors, and health centers keep closing. Our Africa states, “there are only 3,150 doctors in Madagascar, which equates to just 1.6 physicians for every 10,000 people,” and, “basic care is provided free here, but families have to pay for supplies such as bedsheets, dressings and food. And hospitals also suffer from a shortage of staff, particularly specialist surgeons.” There are rural health centers because it is expensive to travel to an urban hospital, but often families have no choice but to travel because many rural centers have closed due to lack of staff and money (Our Africa).

Education is available in Madagascar, but not for the very poor. In fact, only about 65 percent of both adults and youth are literate (Our Africa). There is primary schooling for ages 6-14, which is followed by three years at junior secondary level. Usually only the children from the wealthier families move on to junior secondary school. Upon completion, they can move on to another three years at a senior secondary school. If they finish they may go on to a university (Our Africa). In addition, the government has cut funding for schooling, and this has made it more expensive for the people to send their children to school, which has lowered enrollment even further. These things make it clear that life for the people of Madagascar is rough, as they have inadequate diets, health care, and education.

Agriculture is largely prevalent in Madagascar. According to Clark, 70 percent of Madagascar’s population is rural, and jobs in agriculture make up over 80 percent of both men and women (63). Of course rice is a popular crop, but “cassava, mangos, fruit and bananas are also commonly grown, as is sugar cane for exports of sugar. Palm, soybean, coconut, and sunflower oil are produced by some growers. . .” (Our Africa). Farmers here practice a type of agriculture known as “slash and burn” or “tavy” agriculture. Slash and burn, or tavy, agriculture is a major part of Madagascar’s economy. Primarily, it is used to create rice fields by destroying the rainforest (WildMadagascar.org). Explaining further, “typically, an acre or two of forest is cut, burned, and then planted with rice. After a year or two of production the field is left fallow for four to six years before the process is repeated. After two or three cycles, the soil is exhausted of nutrients and the land is colonized by scrub vegetation or alien grasses” (WildMadagascar.org).

Slash and burn is an extremely unsustainable agricultural technique. Deforestation is one of the biggest environmental issues currently facing Madagascar, and it leads to other things. A website describes soil erosion is one of Madagascar’s greatest issues affecting the environment along with deforestation. The erosion has stemmed from the deforestation, and in some areas the soil loss may exceed 400 tons (WildMadagascar.org). Clark adds by saying that erosion leads to water contamination, among other things. The eroded sediments end up in the crops resulting in in poor food quality. If the trees of the forest were still in place, the erosion would not be nearly as severe, and they could soak up the water from the rivers when they flood, which would make the farmers’ crops of higher quality (67-68).

However, it is difficult for Madagascan farmers to see the danger of slash and burn agriculture. It is what they have been doing for generations, and it is hard and costly to change. Also, they think they see positive results with the current practices. Klein says that after slashing and burning a section of forest, there is a short time that the production increases. The ashes fertilize the soil and make the growing conditions good. However, this is extremely short lived, and after the land is exhausted of nutrients, farmers leave it and move on (qt. in Clark 67). They burn more forest and farm the newly cleared land.

Cutting down the forest has serious consequences. Harper et al. state that the forest provides a home for more than 90 percent of Madagascar’s animals (qt. in Clark 68), and Howden, Johnson and Chenje, and

Harper et al. say that biodiversity has been put at great risk because of deforestation. There are many species of plant and animals in Madagascan forests that are found nowhere else on Earth. However, many are at risk of extinction (qt. in Clark 68). It is important that the forest and land are preserved.

As of 2008, Johnson and Chenje claim that “. . . Madagascar has lost between at least 50 percent to about 90 percent of its forests throughout human history” (qt. in Clark 65). That means that possibly only 10 percent of Madagascar’s rain forests remain. Studies have shown the side effects of deforestation. Madagascar has erosion, desertification, and water scarcity problems from deforestation, not to mention that the land is unusable. Soon, farmers will be without land to farm, and therefore without food to eat and sell. Clark puts it perfectly: “. . . it is clear that unless Madagascar promotes sustainable agriculture, its land will be negatively impacted and hurt long-run agricultural production” (61-62).

So what can be done to combat this problem? There are several ideas and options discussed, because methods of production must change. There are two options that stand out. Direct sowing mulch based conservation agriculture, (DMC agriculture), and Inga alley cropping are two realistic ways for Madagascans to farm. In fact, some farmers in Madagascar are already using DMC, and alley cropping will soon be underway. While the two are somewhat similar, they target two different things.

DMC agriculture is based around the idea of halting erosion. The AFD/FFEM, a foundation devoted to agricultural revolution, explains that the DMC method works by sowing seed directly into a layer of permanent crop residue. The stalks and roots from the crop of the previous year are left to rot into the ground, without tilling. This creates a layer on the soil, which combats erosion and boosts fertility for the next year (AFD/FFEM). DMC is a no-till approach to agriculture. The goal is to stop erosion, increase soil fertility, stabilize or increase yields, and reduce fuel consumption. The AFD/FFEM outlines that the three major aspects that this technique is built upon are no tillage, permanent plant cover, and crop rotations/cover crops (AFD/FFEM).

Leaving the crop roots and stalks in the ground is a natural way to “till” with the help of earthworms, which are saved because the ground is not physically tilled by farmers. This also protects from wind and water erosion. The roots hold the soil in place when it rains or becomes very windy. Also, DMC agriculture halts erosion that is currently occurring, which restores plant cover. In doing so, it controls water runoff, stimulates biological activity in the soil, and reduces water needs (AFD/FFEM). In this way, it can be used to restore wasteland or the land that has already been left behind due to deforestation.

Another benefit is that the crop residue layer helps combat weeds. It blocks sunlight to the ground, making it difficult for weeds to grow, but allowing the crop to grow because it is planted directly into the residue. In addition, the need for fertilizer goes away. The ground is fertilized with the stalks and roots of the previous crops. DMC works best when farmers rotate crops, or grow cover crops for a year. Since rice is what most farmers primarily grow in Madagascar, it is appropriate to rotate with beans or peas.

DMC agriculture will save farmers money once it is established. They will save money in not having to purchase fertilizers or weed control since DMC agriculture provides these. Also, most importantly, DMC can make farmers money. It stabilizes or increases yields, so farmers will have more. As stated, it halts erosion and deforestation. The roots keep the ground fertilized and full of nutrients, so they can farm their acre for a longer time.

Another realistic option for sustainable farming is Inga alley cropping. There is an organization called The Homaray Project that is developing this technique to specifically combat deforestation. The Inga Foundation explains that Inga alley cropping works by planting rows of Inga trees and letting them grow. When they grow, they block sunlight from the ground, which makes it impossible for weeds to grow. When it gets close to planting season, the trees are pruned to chest height, and the leaves are spread on the

ground as a mulch and fertilizer. The crop is then planted, without tilling, and harvested, and the trees grow again for the following year (Inga Foundation).

The Inga Foundation says that the Inga trees retain the nutrients in the soil so that the farmers can use the same plot sustainably (Inga Foundation). This works to stop deforestation because it will not be necessary to burn any more forest, and it helps with erosion because the trees hold the soil in place. Like DMC, Inga alley cropping will save farmers money in the areas of fertilizer and weed control. Also, the families use the pruned branches as firewood, so they save money in that respect as well.

The major drawback to Inga alley cropping is that the Inga tree does not grow naturally in Madagascar. This is where The Homarary Project comes into play. According to the Inga Foundation, The Homarary Project already has tree nurseries established for finding a tree with the same qualities as the Inga tree (Inga Foundation). Once the best tree is chosen, more nurseries will be set up to sell seeds to farmers.

While both approaches are realistic, it will still require a lot of work on everyone's part. The farmers of Madagascar are very set in tradition. Their role is to convert to these new, more sustainable techniques. However, neither practice can be established in a year, and farmers do not have the knowledge or money to waste time. This is where world organizations can help. The farmers need to be educated and financially supported through this process, and there are organizations set up to help with those items.

Financially, there are various options available. Microloans are a great opportunity for farmers in Madagascar to receive financial help. Lenders loan a small amount of money to farmers to cover the startup cost of changing their agricultural technique. Once they obtain a steady income, the farmers are able to pay back the small loan because it is not too substantial of a cost. There are also organizations that anybody can financially donate to that aid in educating the citizens on living sustainably. In terms of additional education and support, a website lists many organizations in Madagascar to help, including the Andrew Lees Trust, the Conservation through Poverty Alleviation International, and Hope for Madagascar (WildMadagascar.org). All of these organizations that are already established in Madagascar focus on educating the citizens of this country on land conservation and nutrition, and they work to help them live better lives. Finally, the Madagascan government can help by establishing stronger property laws so that farmers are motivated to take care of the land that is their own. If the efforts of these organizations come together in collaboration with farmer efforts, Madagascar can become a more stable agricultural country, and the people will be better fed and have a more favorable environment.

In reflection, currently, Madagascar is a place of severe poverty and unsustainable agricultural practices. It is evident there are too many people who have inadequate diets, income, education, and health care. The people need to take control of their actions and help themselves, and the government involvement needs to be greater. Madagascar producers need to work with worldwide organizations. One of the producer's main areas of control is the ability to end deforestation and implement new sustainable agriculture techniques. Deforestation needs to end, and farmers have to implement new sustainable agricultural techniques to give the people of Madagascar a future with food available. DMC agriculture and Inga alley cropping are two very realistic ways to solve these problems. These possible solutions give the people of Madagascar hope for the future of their children and generations to come.

Picture the future. The goal is to have the seven-year-old wake up in a house, not a shack, with five other healthy siblings and two healthy parents. The goal is for all family members to be educated and for an acre of land to be farmed for a multitude of years, instead of just a year or two. The natural rain forest is left intact so nature exists in its true form. Deforestation is ended, and sustainable agriculture is practiced. Madagascar has a brighter future and a population that is able to survive.

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