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Malnutrition has long been a worldwide problem, and in recent years the effects of this affliction have become more visible. Around the world, people are suffering from an inadequate supply of food or information about the available food. Among the most visibly affected nations are those of Africa. Throughout the continent, the people are suffering because they are not able to properly fill their bodies. In Africa, the main obstacles come from weak central governments, poor crop yields, and outbreak of disease. All these qualities are present in the countries of Western Africa, but they are especially prevalent in Sierra Leone.

Sierra Leone is located on the western coast of Africa and is bordered by Liberia and Guinea. It has an area of 71,740 square kilometers, which is roughly the size of South Carolina (The World Factbook). Sierra Leone gained independence from England in 1961, but the following four decades were filled with widespread civil war. This warfare disrupted the lives of the entire population, destroying and displacing families. Humans were brutalized, leaving their already humble lives in shambles as rebel groups fought for control of the country. Because of this pressure, British troops were deployed in 2002, and democratic elections were held, which lessened the warfare. Despite this improvement, Sierra Leone still is among the most desperate countries in the world. It has the third highest infant mortality rate in the world, with 143.64 deaths for every 1,000 live births. This statistic illustrates how poor the food quality is for the childhood population, and how important that nutrition is to sustain life into adulthood. The nation's education system is poor, and only 31% of the population 15 and older can read and write (The World Factbook). The people live on shockingly low income. The Gross Domestic Product per capita is \$500, which ranks last in the world (The World Factbook). 80% of the total population lives in absolute poverty, and the rural poverty rate is 88.3%. 62% of the people live in rural areas, making agriculture the focus of the economy. Industry is virtually non-existent with the exception of the diamond exchange. However, while diamond mines represent potential for the economy, they are currently under Lebanese control.

It is difficult to define a typical family in Sierra Leone because there is a strong emphasis on community. Most of the people live rurally, in communities of various sizes. They are not organized into families, rather the community works together to farm the land that surrounds the village. There is usually a group of town elders who work to keep the town united. The children may or may not have access to school, and usually end up working with the community to farm the outlying land. The people live in the poverty described before, and farm in order to stay alive.

Agriculture is at the center of Sierra Leone's economy, and it employs a majority of the nation's people. The main agricultural focus is on rice, coffee, and cocoa (The World Factbook). Farmers primarily use a system of farming in which they let certain plots of land lay fallow each year. Each plot is divided into six sections, and only one section per year is farmed. The others remain fallow, allowing various vegetation to

grow. As sections circulate, the vegetation is cut down and burned, allowing it to fertilize the land. This system of farming is inefficient, and presents an opportunity for the agricultural system to improve. In addition to the growing habits, the mechanization of farming equipment is non-existent. The farming is done by hand, with primitive tools. The people of Sierra Leone do not have access to the proper means of production, and thus cannot provide for themselves or their families. Their situation is one which cannot solve itself, there must be outside intervention in order to improve.

The needs of the rural communities of Sierra Leone are shocking. Food is limited for the entire population, but is especially lacking at the infant level. After breast-feeding, infants are fed with a type of rice-water mix, which is little more than a watered-down gruel. This does not provide the infant with the necessary minerals for growth, and inhibits the potential of the children. This presents an opportunity for improvement in the area. In order to farm more efficiently, the people of Sierra Leone need access to better tools as well as information about improved farming techniques. The problem with these solutions is that they all require money, which the people don't have and which they can't work to make. Therefore, there must be outside intervention from the United Nations or other international organizations in order to improve the people's situation.

Food production in Sierra Leone is primitive and disorganized, as described in the above paragraph. In addition to these obstacles, Sierra Leone is and has been an unstable country. There is no assurance of safety, and the threat of an oppressive government is never far off. The people have seen the ravages of civil war, and they have had to live with the consequences, both socially and economically. The rebels that tear through the country leave the communities land ravaged, their crops ruined, and the village in disarray. The already insufficient food production plummets even further with the addition of this threat. The recent past of the country shows how severe the obstacles are to improving food production. However, the present gives hope for an improvement. As stated before, British forces were deployed in 2002 in order to set down civil war and to implement democracy in Sierra Leone. It was a successful attempt, and democratic elections were held. This gives hope to the people of Sierra Leone, that there can be safety within their country. Now, the focus must shift to the improvement of nutrition and production, in order to improve the lives of the nation's people. This improvement is most critical in the early stages of a child's life.

A major problem in Sierra Leone is that children at a critical age aren't getting the necessary vitamins and minerals. The weaning process is introduced to the children at around twelve months of age. This is similar to well developed countries, but there is also an early substitution for solid foods. The first solid food and the most popular weaning food is a thin cereal gruel that is called by different names, such as pap, akamu, ogi, or koko. It is most popularly introduced to children when they are three to six months of age. It is usually force-fed with a spoon and bowl, although a few mothers use the more traditional hand-feeding method

After the introduction of solid foods, the child receives types of cereal gruel or other staple foods from the family menu. These foods include yam and rice, which may

be prepared with sauce or in soups. These foods are usually mashed, thinned, or pre-chewed. As soon as the child is able to chew, he or she is given pieces of food from the family pot. Few infants are fed meat, eggs, or fish products because of the lack of resources. Legumes, a pod plant similar to peas or beans, is seldom used for weaning and is introduced to the diet later on, despite its availability. This is because Legumes causes problems with the digestive system, mainly through diarrhea.

Pap, ogi, or koko is similar to a porridge made from corn and other starchy grains, roots, and tubers. Pap contains only about 0.5% protein and less than 1% fat. It is said that the protein content is too low to support rats. It is high in carbohydrates but lacks other nutrients the child needs to develop properly. Carbohydrates are the main source of energy and are commonly found in potatoes, bread, rice and other starchy foods. The diets of the families which most infants are weaned to are also low in nutritional value. These traditional foods are low in protein, calcium, and other nutrients. These nutrients are lost due to poor processing of the foods. The other problem with the diet is the bulk. For adults and older children, it is possible to get a reasonable protein intake because of the size of their stomach is able to process the amount of food with low nutritional density. On the other hand, for the infants and small children the volume of the traditional diets maybe too large to allow the child to take in all the food necessary to cover his or her energy needs. A baby aged four to six months would need 920 g of corn gruel to meet daily needs of energy (740 kilocalories) and protein (13 g). This is an impossible task, considering the size of an infant's stomach.

The lack of nutrients in the traditional weaning foods and feeding practices causes infant to experience malnutrition, growth retardation, infection, and high mortality rates. Kwashiorkor and Marasmus are two severe conditions that develop with protein deficiency. Kwashiorkor is a form of malnutrition caused by inadequate protein intake despite the presence of fair to good carbohydrate intake. Early symptoms of any type of malnutrition are very general and include fatigue, irritability, and sluggishness. As protein deprivation continues, it causes growth failure, loss of muscle mass, and decreased immunity. Marasmus is basically the same thing but it is not connected directly to protein deficiencies but other minerals as well.

Our suggestion is to provide a dietary supplement through a type of formula. The formula would contain the necessary protein so that they would be off to a healthy start. The mix would come in ready-made pouches or another sealed container. The reason that it wouldn't work if you sent the formula in a powder form and have the tribes or villages add water to it is, they also lack the water quality to produce a supplement that doesn't have negative effects on the health of the infants. As they grow older their immune system grows stronger and is more resistant to the impurities in the water. The formula would improve the health of the infants and also help the bodies grow at a healthy and normal rate. Even if they just mixed it into their diets and didn't just go straight to solid foods during the weaning process, the children would benefit. Hopefully, they would grow up with strong bodies and strong minds. The children would progress through school systems and learn more that before the would be stronger as they become adults, and would become greater assets to the town or village. Soon, after a few

generations, the tribe would become less dependent on outside nations for aid. With the implementation of these ideas, and the initial support of sponsors, Sierra Leone could close the gap between its present situation and the goals of the future.

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