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Beteza, Madagascar: Malnutrition

### **Fighting malnutrition with insects in Beteza, Madagascar**

The reason why I chose malnutrition is, at first, because nowadays many countries suffer from this problem, and this alarming, since due to this problem we are losing many lives. Also, I decided to choose Beteza because this region is in Madagascar (one of the countries that suffers the most from malnutrition), and I also chose it because Beteza is not a very popular place, so not many people would decide to help it, and I consider to be important not only to help the regions that are best known, since at the end of everything we are all human beings and we all have the right to have a dignified and healthy life.

Madagascar, considered the fifth largest island in the world, has a population of around 5 million inhabitants, of which more than 70% of these are considered poor. Most of its population lives in rural areas, and their daily life revolves around agriculture (National Geographic, 2015).

Agriculture, livestock, and fishing, all belonging to the agricultural sector, they are considered a fundamental part of the economy and food security of this island since these activities cover 75% of the needs of this place and these generate 86% of the jobs, making that about 80% of the families dedicate themselves to this, and giving work to 60% of the young people (IFAD, 2019).

Malnutrition in this country has always been a big problem, but according to the United Nations, in recent years it has been more affected since the phenomenon "El Niño" caused this country to be seen in a wave of drought, affecting the food production that they had, the southern part was the one that was most affected (United Nations, 2016).

Beteza is a city that is located in the country of Madagascar. It belongs to the Bekily district, which is part of the Androy region and according to the last record of this city, which was in 2001, the population is approximately seven thousand people of which 80% of the population is engaged in agriculture and the other 20% is engaged in raising livestock (Ilo, 2017).

To begin with, the population of this region only studies primary education; in terms of health, only between 60% and 70% of the population of all of Madagascar have easy access to primary health care. That means that many people have to travel long distances so a doctor can treat them. It is important to mention that the health system in Madagascar is a combination of practices of traditional medicine, which means that they use natural resources such as: plants, animals or minerals; and western medicine with the use of drugs, radiation or surgery (National Library of Medicine, 2008). Evidently, this is a place that does not have many services, so they come to suffer a lot.

There is not much information about Beteza, but what is known is that this city belongs to the southern part of Madagascar, which is the one that suffers the most from malnutrition. So that they realize how bad their diet is, I have to tell you that their typical dish is a vegetable dish accompanied by a Ro dish, which is a mixture of herbs, leaves, and rice. On some occasions, they can eat chicken, meat, or fish (Goway, 2022).

This would not be so worrying if only one person ate this, and in good proportion, but the bad thing is that it is not a single person per family, but they can be four, and there are even cases in which it can be nine or more members of a family, depending on the area in which they are located (Findings K, 2004).

It's important to mention that the climate of Madagascar is hot and tropical, with the east coast receiving the most rainfall. East coast temperatures reach an average high of 85°F (29° C) in the summer and 72°F (22°C) in the winter (Country Reports, 2022). That is why the southern part of Madagascar suffers from severe malnutrition because, according to UN information, climate change has a lot to do with this. Several regions have been severely affected by a major drought, the worst that has been seen in the last 40 years. This has caused that there is not enough water for every region, causing that more than half of the harvests did not reach their end, for which the most common way in which they received food was affected, they don't get the same food as they used to (United Nations, 2021).

It is fundamental that we start to do something to eliminate this problem since according to the Institute of Nutrition of Central America and Panama (INCAP), malnutrition can generate many consequences, for example, there is inadequate growth and development, increased risk of disease and death, lower and poor performance in physical work (INCAP, 2013). Apart from affecting the population, it could also cause a lag at a national level since people do not perform in the same way, that is why we must find the solution to this problem so the country can grow and give the best of itself.

That is why my proposal is to make a Malagasy field cricket farm, since these have many nutrients that can help eliminate malnutrition, to begin with, they have essential minerals such as iron, calcium, magnesium, manganese, copper, selenium, zinc and phosphorus, they also have many vitamins such as B2, B12 and folic acid (Proteinsecta, 2020). With this proposal we would help many people who suffer from hunger, apart from the fact that we would be giving them opportunities to have a healthier life.

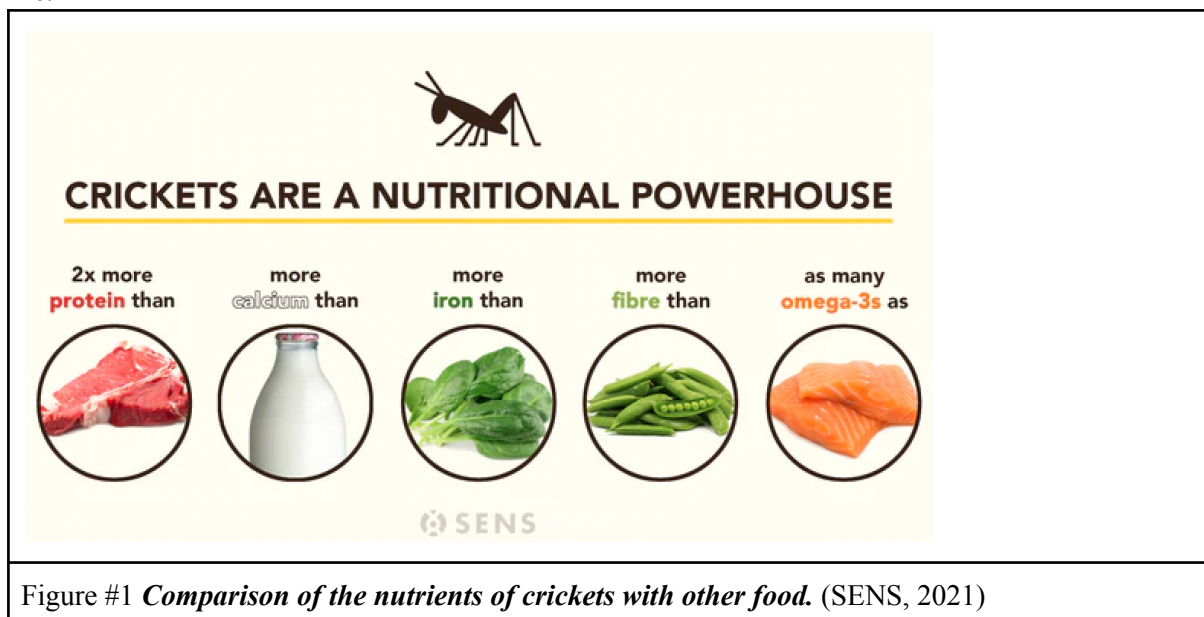


Figure #1 *Comparison of the nutrients of crickets with other food.* (SENS, 2021)

I believe that this proposal is not going to cost much to implement it, since in Madagascar they are used to eating different insects like cockroaches or beetles, but unfortunately these ones not always have the necessary nutrients to be able to eradicate the malnutrition that exists in that country. And sometimes the population doesn't want to eat the insect because they simply are fed up with eating always the same or sometimes they do not like the idea of eating insects in its natural form.

That is why apart from making a cricket farm, we could also turn them into flour since in this way the population could prepare them in different ways. I think this is a very good way to help since to make the flour is not a very difficult job, apart from the fact that in this way we would not only be helping people but also the environment, since doing our breeding of insects would be a better alternative than traditional livestock, since the former is developed in much more sustainable facilities and with fewer emissions and discharges compared to traditional farms (Proteinsecta, 2020).

It is important to mention that the flour that would be created from cricket has 60% protein, that is why it is categorized as a protein-rich food (Edwin Orlando, 2017).

This feature enables the food production that can be used to supplement diets lacking in certain nutrients, as well as items for those who require vitamin supplements. For example, cricket flour can be used to manufacture high-iron biscuits, which will aid children's growth by ensuring that they get enough of this vitamin. The high entomo protein content of this flour is one of its most notable features. Entomo proteins are proteins that are obtained from insects. In comparison to other flours, 100 g of cricket flour includes roughly 76 g of protein, 11.4 g of sugar-free carbs, and a higher energy intake. Apart from the fact that this flour can be used to increase muscle mass, which requires a high protein consumption. In this situation, cricket flour's low carbohydrate content might be advantageous. The high protein level, which is rich in necessary amino acids, would, on the other hand, benefit anyone who included it in their diet, because of its high fatty acid concentration. One of the reasons that a balanced and varied diet is recommended is because the body needs the ability to absorb so-called necessary amino acids from foods in order to function effectively. They're called that because they're vital for the body, but it can't synthesize them on its own, so we have to get them from the food we eat. This procedure is made much easier when using cricket flour, because it contains all nine essential amino acids for the body, a feature not found in any other diet.

“Another benefit of including cricket flour in the diet is improved memory, increased energy and a better functioning of the nervous system, thanks to the high level of vitamin B12 present in cricket flour” (Proteinsecta, 2020).

In order to receive all these benefits that cricket flour gives us, first of all it is important that we teach a person to make a cricket farm, since it is necessary to be aware of several things, such as the place where the crickets are going to be found, the temperature of this place, to see that the place has the necessary space so that the boxes in which the crickets are going to be found can enter, apart from to be feeding and caring for the crickets. It may be a very difficult job, but the result will be worth it.

Table #1: *Approximate cost of the proposal.*

Description	Category	Amount	Price unitary USD	Total
Harvest	Wages	8	0.83	6.66
Carton box	Input	1	0.25	0.25
Egg cartons	Input	7	0.01	0.01
Water tank	Input	1	0.15	0.15
Food deposit	Input	1	0.15	0.15
<b>TOTAL</b>				7.22

This is the approximation of the costs of a production of 160 gr. of cricket flour. (Edwin Orlando, 2017)

“These costs include expenses for permanent and temporary labor for the collection of crickets, in addition to the purchase of the box for the farm, concentrate for fish at 42% protein, two plastic tanks, one for water and another for food, egg cartons and cabbage” (Edwin Orlando, 2017).

This proposal could really eliminate the malnutrition that exists not only in Beteza, but in all of Madagascar, since it can cause many physical problems and can even lead to death in the population. It may seem that at first there will not be too many crickets for the entire population, but it will not be impossible to reach that goal, considering that if this work is not left aside and if the necessary support is available, over time the farm would have enough crickets to be able to make the amount of flour that is needed and that would be enough for the entire population.

I should mention that the government of Madagascar would assume an important role in eradicating malnutrition since if they do not like the project or do not believe that it is the best, they could prevent the measures from being implemented in their country.

One barrier that the government can present is climate change, since this is greatly affecting the planet's temperatures, causing disorders in the normal cycles of the earth, this would cause the appropriate conditions to generate the cricket farm not to exist. The way in which it can be solved, not only needs the government of this country, but everyone, we all have to make a change so that in this way climate change decreases and does not affect temperatures anymore.

Citizens play an important role in this project since they will be in charge of organizing the community that is in favor of the proposal, in this way the inhabitants will be able to form groups and send various representatives to inform the government how the project is advancing, in this way they would be generating pressure so that the government has a participatory role in the proposal, reaching

the point where the government gives suggestions and supports the growth of the farm and like that, little by little, the malnutrition can be eliminated.

It is planned that this project will be financed by the FAO (Food and Agriculture Organization of the United Nations), an organization derived from the UN, dedicated to looking for food production and agriculture.

If it is true that one of the problems that we can present is the lack of culture for eating crickets, this is not something very chaotic, because an easy way in which we can solve this is with cricket flour, therefore if we have this product will make it easier to add these nutrients to the food that they consume on a daily basis and apart from the nutrients that they would be consuming to eliminate malnutrition, they will not have to make a great sacrifice since they would be consuming the food that they normally eat. In any case that they do not want to consume their food with cricket flour, another way in which we can solve this problem is to consume recipes which will have cricket as protein or cricket flour.

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