

How Our Generation Will Use Aquaponics to Change Africa

As you are walking the streets in Africa, you will notice on one street corner children starving and begging for food, but on another you will witness children ostracized due to obesity. Africa faces two very predominant conflicting issues, the problem of malnutrition and the increasing problem of obesity. According to the African Progress Panel, each year Africa imports \$35 billion worth of food. These imports are not the healthiest foods, but can be pallets of Doritos, cases of Coca-Cola, and other foods that are low in nutritional value. African citizens already battle the constant problem of malnutrition. In 2014-2016 it was estimated that 233 million were hungry/malnourished in sub-Saharan Africa alone. Due to so many people not being able to afford healthy fruits and vegetables to eat, they choose the cheaper processed foods. This is creating a public health crisis in Africa, and has refocused the problem on malnutrition, as well as obesity. Residents who have been in famine for such a long time, develop slower metabolism in order to hold on to every calorie. When people binge-eat on unhealthy foods their metabolism is still processing slow, creating a cycle of weight gain. In an article written by Jeffrey Gettleman for the New York Times, Gettleman discusses the fact that Africans have abandoned the traditional farming due to expenses, lack of good soil, and scarcity of water – a lethal farming trifecta. It is clear that Africa needs a cheap, sustainable, and healthy food source to comply with the United Nations 2nd Sustainable Development Goal of No Hunger.

Although Africa has found a temporary solution of cheap food in the form of junk food, the problem of malnutrition is morphing into an issue of noncommunicable disease such as heart disease, diabetes, and an increase in obesity rates. With the Bill and Melinda Gates Foundation grant, I propose we use it towards providing wholesome food with Aquaponics systems. Aquaponic systems are a system in which you use fish to grow crops in a soilless plant

beds that float in water. The fish and plants work in a symbiotic sequence together. The fish's waste product, ammonia, is turned into nitrate and nitrite with help from bacteria, and this nourishes the plants and encourages rapid growth. Because the plants use the fish waste for nutrients, the plants actually clean the water, so the fish can continue to swim in clean water. My class has done extensive research on aquaponics systems, and how we can use them to solve problems in our world. We actually have our own aquaponic systems, in which we use three different types of fish – Tilapia, Goldfish, and Koi – and along with our fish we grow many crops. We are constantly conducting research projects to figure out how we can make these systems even better and sharing our research with the world.

For Africa I believe using a basic aquaponic system could greatly relieve the pressing hunger issues. Africa farms suffer from very poor soil and lack of water. According to the Natural Resources Conservation Service Soils, in the last four decades there has not been a 3-5% increase in agricultural growth, which will guarantee a stable food source these countries. Water is another problem for farming in Africa. One in nine people do not have access to clean, and safe water in our world, and without clean water you cannot grow food. A basic Aquaponics system will have no need for soil. Our Aquaponics system in my school utilizes clay pebbles to help the plants grow in water, which are cheap and reusable. An Aquaponic system in Africa calls for little water. The constant cycle of water between plants and fish makes this possible. Lastly, Aquaponics systems are very reliable and need little maintenance. Cost will be minimal, because the systems only need new crops to plant. Everything else that is involved in the system is reusable. There are more than just the aspects of the tank itself that goes into having a successful Aquaponics system. With the grant, I believe that establishing a way to educate the people of Africa on these systems will help gain the community support we

need to enact a plan to bring health food to their communities. A possibility for education is bringing two people from each town to America and having a two-week training session for aquaponics, which would include maintaining, educating, and building their own tank. By educating just two people, this will create a chain reaction in these towns and villages, and soon everyone will be involved with aquaponics. Also, with the grant I plan to use it to help purchase and supply the villages with the proper equipment to build their own systems. Supplying the correct equipment will ensure that their communities have the correct means for building a sustainable and reliable system.

In order to make this idea sustainable, I believe that selecting a town or village first and applying the Aquaponic farming technique, will allow us to learn what makes the system work and what doesn't – scientific process. After we apply this system to a small place, we can scale up the technique and use it on a country, then 3 countries, and eventually the continent of Africa itself. As an example of a scaled-up Aquaponics system, Disney World in Florida is home to one of the largest aquaponic systems in the world. Disney has managed to spread the importance of an Aquaponic system and a way people can execute this cheap farming in their own homes. What needs to be stressed is the changeability of these systems. Aquaponic systems can be as big as Disney's, but a system can be small enough to fit into a corner of a dorm room. Aquaponics are flexible, simple, have minimal maintenance; and this is what makes them so attractive for a small country in Africa.

The UN Sustainable Development Goal number two is the most important goal because if you cannot provide healthy food, people get sick. If people get sick, then no one can work and earn money, which makes it nearly impossible to reach the other Sustainable Development

Goals. People in Africa are in a never-ending cycle of hunger crisis, and Aquaponic systems could change this negative cycle for the good.

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