

The Single Story of Ethiopia

By Sean McMillen

*Ethiopia,
A country
Written top to bottom with blood
With blazing sunsets
That now sucks the life from.
People and animals
Places and thing
Causing wide-spread famine
And water insecurities.*

*A country
Where more than a quarter of its society
Barely knows how to write or read
Due to the house of cards they call school buildings.
Barely being able to make a living
God forbid they try to buy anything
With the little they make
For the family that they feed.*

*A country
That is almost always in turmoil
With a rival or even domestic rebels
Becoming harder to “control,”
Starving a population of Aid and necessities
So that they could pay
for an army to fight
To fight their people.*

*Ethiopia,
A country,
Told to be filled with flaws
In the single story that we made
In response.
To the war and bloodshed
To the famine and struggle
And the people the world has lost.*

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Ethiopia is located in Eastern Africa, bordering Sudan, South Sudan, Uganda, Kenya, Somalia, Djibouti, and Eritrea (Ethiopia physical map, n.d). Ethiopia became landlocked in 1993 when Eritrea broke off from the country to form its own separate nation, making Ethiopia heavily reliant on its neighboring country of Djibouti for international trade(Inadin, 2008). Being landlocked meant that Ethiopia began to struggle resource-wise, causing growth in the country to come to a halt(Inadin, 2008). Being the second most populated nation in Africa (The World Bank, 2021), it has around 118 million people (World population review, 2021). Ethiopia is roughly 1.1 million square kilometers(Central Intelligence Agency, 2021). The majority of the population, however, resides in Ethiopia's High plateaus and center Mountain range due to the rest of the country being too hot and dry to live comfortably. Poor education (Scholaro pro, 2021), little to no healthcare, mass food shortages, very little sanitation, and a decreasing amount of clean water are all causing countless people to die (Central Intelligence Agency, 2021). With only 21 percent of the population living in an urban, more modern society. The other 78 percent are suffering; in run-down shanty towns made primarily of wood and mud (Central Intelligence Agency, 2021). While both local and global organizations have given aid to rural communities, there is still a great deal of work that needs doing.

In Ethiopia, family is by far the most important. Households are usually relatively large, consisting of three generations(Evason,2018). The first generation is the Eldest, then following them are their sons and their wives. Following them are the children of the wives(Evason, 2018). Females generally move in with their husbands when they come of age(or beforehand in some impoverished societies)(Evason, 2018). A fourth of all families in the country live below the poverty level(Teka, 2021). While much has been accomplished in the last ten years, The World Bank (2020) estimates that the per capita income in current US dollars is 936.34; while this is low, it also shows that it has been steadily increasing in past years, meaning more than likely it will continue to rise (FAO, 2018). A family will typically eat three meals a day, dinner being the biggest. Many things are much slower-paced in Ethiopia; this includes cooking. Just making a cup of a pot of Buna (another name for coffee) can take a couple of hours(Evason, 2018). Most dishes in Ethiopia are served, with their staple food, Injera. Some foods that are traditional in Ethiopia are Ful, Doro Wot, and Tibs(Awaze Tours, n.d). While that is the norm, many people in poverty can not afford food; Impoverished families could go days without food; Additionally, Lack of clean water often causes illnesses(Food and Agriculture Organization, 2010). With no health professionals around to treat people correctly, many people stay sick for extended periods. Most children attend primary school, which is about six years (Scholaro pro, 2021). The schools, however, are of lower quality due to a lack of sufficient funding from the government. Many children drop out after primary school; as a result of this, only 31% of adults can read and write (Trines, Sefan, 2018). To go along with all of this, farmers make little to no money on their crops. That means that they don't have money to spend on things that they need.

Climate change in Ethiopia is rapidly a significantly larger problem. The Climate usually stays the same year-round, getting a little rainfall in spring followed by more rain in the summer (John Bliss, 2016). Due

to climate change, however, not only is it getting much hotter, but the weather is also becoming more extreme (Chemonics International Inc., 2015, p. 1). Instead of slight rainfall, they could suffer from massive storms or have no rain at all (Chemonics International Inc., 2015, p. 1). These extreme events have most likely significantly increased in the past six years since USAID (2016) made a technical report of their findings looking into Climate change in Ethiopia. Due to the increase in droughts, soil degradation and desertification have been happening more frequently; This causes farmers to lose their fertile land (Hailu et al., 2015). To add to these problems. Due to Ethiopian farmers lacking in education and technologies, they can lose some of their harvests due to a simple lack of information and agricultural know-how. All of this leads to Ethiopian farmers, which make up roughly 85 percent of the population, being economically unstable (John bliss, 2016; Endalew et al., 2015). Currently, 43 percent of Ethiopians lack access to safe drinking water and 72 percent lack improved sanitation (BTI Blog, 2020). The majority of the people who have access to clean water live in cities making up 21.7 percent of the population.

A potential solution to the dilemmas of food and water scarcity and several other problems came from the science of plant respiration and photosynthesis. When a plant takes in water, it aids in the chemical reaction that happens in the plant to make its food. The water, however, is not used up in that process. The water is released back out of the plant into the air. This process is referred to as transpiration and there is no loss of water in the process.

The greenhouse will be a tunnel-shaped closed system that will help produce crops in areas once unsuitable for agriculture. The greenhouse will split into five singular, identical units, each having solar panels to handle all of its power.

The building will get separated into singular units for a couple of reasons. The first is so that soil does not need to be changed. Growing the same crop repeatedly in the same soil will cause it to lose its nutrients. By rotating the crops, they will stay healthy and fertile. The second reason is problems. If a crop develops diseases, grows weeds, or any other issues arise, it will not spread to all the crops, decreasing the likelihood of a bad harvest; This John bliss (2016) says is what irritated farmers the most. They put in time, effort, and money to get nothing in return if the harvests get a disease. The final reason is structural integrity. In Ethiopia, the weather changes are drastic. If the supports are better inside the structures, they are less likely to collapse in a heavy storm. There are two doors to go through to enter, thus, creating an airlock making sure that no moisture gets out. The airlock will also help to prevent flooding from the entrance. Note that this is only an example. There is no limit to how many units can be built in succession.

The way transpiration can create a reliable source of reusable water will be as follows; Through the science of transpiration, the water from the plants transpires and will become water vapor. After it turns into a gas, two large fans creating a circular airflow will carry the water through a system to get condensed. The fans will also help with heat making sure that it does not get too hot. Once condensed into droplets, water flows into a fluid tank, each tank holding three times the needed amount of water; this will be where the fluid is collected and used in an irrigation system. The irrigation system comes directly from the tank. The irrigation system, being reliant on gravity, allows it to run without a power source. A valve is needed to let the water flow down into the tubes. Small holes in the piping are attached to smaller elastic ones. The water having nowhere else to go is forced out into the soil completing the system.

In the event of a problem with the solar panels or power, the greenhouse will still be usable for planting due to the irrigation not being reliant on electricity.

The glass roof will also be tinted so that the plants can receive direct sunlight without getting harmed by the intense rays. The greenhouse roof will also function as a massive rain collector. The rain will run off and get collected in a separate tank, which will supply a great deal of clean water for people to use. Due to Ethiopia having a relatively warm annual climate, harvests can happen all year round, helping tremendously with the lack of food. Since the greenhouse does not need much water outside the initial supply, approximately 80% of the water collected from rain is harnessable for other things like drinking and cleaning.

As it stands, 36% of Ethiopia is agricultural land(Central Intelligence Agency, 2021). Of that 36 percent however, only 15 is arable farmland and that number continues to decrease as climate change becomes increasingly more prominent. With 85 percent of the Ethiopian population being farmers and the amount of arable land decreasing rapidly, farmers are losing their jobs, income, and food, causing mass food shortages (John bliss, 2016; Endalew et al., 2015). With these greenhouses in place, Ethiopian farmers will be less likely to leave their once drought-ridden fields. Farmers would have a reliable growing season without worrying about locusts, diseased crops, water scarcity, or soil degradation due to climate changes(FAO, 2021; Endalew et al., 2015. Additionally, because the irrigation tanks will have a great deal of excess water in them, they will last through multiple growing cycles before needing to be refilled, causing a decrease in water insecurity. These greenhouses will make it so that farmers can cultivate crops where they did before, creating a more stable supply of food and lessening the population density in the country; This may even result in less of a need for international aid in the future(Alemayehu et al., 2020). With proper education in crop management and sustainability, farmers will also increase their yield and decrease the costs to uphold the farms(Nigussie, 2020). With the farmers' enhanced knowledge in saving crops, they will also see an increase in quality due to increases in crop biodiversity(John bliss, 2016).

Having connections with stakeholders, donors, and organizations is great to make sure such a broad and complex solution becomes a reality. Feed the future is a government-backed organization that helps a multitude of countries with food and water security(Feed the Future, 2021). Their connections with local Ethiopian farmers and their extensive knowledge about crop rotation and management would greatly help to teach farmers how to use the facility and the proper way to keep the soil rich and healthy. USAID is another government organization that would be very helpful if their connections with stakeholders, both big and small, would be extremely beneficial for sourcing materials. USAID would also be able to help politically, making sure that these greenhouses are being used for their intended purpose, that purpose being: to help feed the local people and provide clean drinkable water. The last is a Local organization called AISDA. AISDA is an Award-winning Non-governmental Organization that has plenty of connections with donors and local government partners. NGOs are organizations that do not work under any specific government(AISDA, 2021; Devaid, 2020). That means NGOs can work on their terms without needing government approval. The Ethiopian government is another key stakeholder in Ethiopian society. The government in Ethiopia is a federal republic; This means that it is structured similarly to the United States with a three-branch system(Global Edge, 2020). While it is a key stakeholder, historically, it

has been more of a blockade to help with food solutions than anything. By taking advantage of NGOs like AISDA, it is more probable that we will see change happen in the country.

Climate Change is a massive problem everywhere; in places like Ethiopia that have been doing the same things for hundreds of years, the change it has can be detrimental to the whole country(John bliss,2016). While their futures seem grimmer and grimmer as time passes, these greenhouses may give them a chance to help them take land that is now unusable back. These solutions are only an addition to the number of other solutions already in place. With the help of organizations like Feed The Future, AISDA, and USAID, Ethiopia has so much room to grow and that seeing grim light at the end of the tunnels is a little bit brighter.

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