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**The Democratic Republic of Congo, Factor 6: Sustainable Agriculture**

### **The Congo's Crisis**

The Democratic Republic of the Congo, or the DR of Congo, is located along the equator in the heart of Africa. It is the 11th largest country in the world and maintains a hot, humid, climate. Most of the Democratic Republic of the Congo is covered by the world's second largest rainforest, the Congo Basin (worldwildlife.org). This forest has inspired the legends of Tarzan and many other myths and fantasies. Over 10,000 species of flora inhabit this region and around 30% of those are indigenous to the the Congo Basin. Likewise, there are 400 species of mammals, 1,000 species of birds and 700 different species of fish(wwf). This region is vital not only to the continent of Africa, but also to the world itself.

The Congo Basin has been inhabited for around 50,000 years (wwf). The natives are very connected to nature and are reliant on the basin for their needs which includes raw materials (wwf). Compared to the rest of the world, a lot of the the people practice the ancient hunter-gatherer lifestyle. For those that do not, rely mostly on subsistence agriculture.

The mineral and resource content of the Basin is very rich, which has led to many countries wanting to colonize it over the course of history. Some of the raw materials that the Congo is known for are timber, diamonds, gold and oil (ourafrika). A problem that the Congo faces is that present practices that they use to extract these materials are destroying the ecosystem and resulting in deforestation. An example of one of these practices is fracking, which is a common way to extract oil. Fracking is done by drilling a well down until it reaches a gas or oil deposit(facts about fracking). The drill then turns 90 degrees and drills horizontally(facts about fracking). Once the drilling is complete, the well releases a pressurized fracking liquid which made of water and chemicals(facts about fracking). The liquid combined with the pressure is strong enough to break the surrounding rock and lo and behold the oil or gas flows into the well so it can be extracted(facts about fracking). This way to extract oil harms the environment in two ways, water pollution and environmental destruction. The fracking liquids can seep into the nearby water tables and local wells(cost of fracking). Another cost that comes with the technology of fracking is environmental damage. An example of this is happening in Wyoming. An oil company practiced fracking and as a result, it fragmented the biome because of the large holes and barren soil left after fracking. This led to decrease population of mule deer's population by 56% (cost of fracking).

Over the past ten years the country's unemployment rate has been between 40-60%. For those that do have a job, 7 out of 10 of the workers are in an agricultural pathway. Because of the high percentage of agriculturally linked jobs, most of the Congolese people get their food from local markets or from their own backyards.

With over 150 different cultural groups, the inner workings of the average family varies greatly. Most Congolese families are composed of five people, but in some regions this greatly varies. Some people of the Congo practice polygamy. Most of these polygamous relationships are concentrated in the interior of the basin.

Around 52% of the population is under 15, and most children only receive nine years of education(cia). 46.2% of the population cannot read (cia). In 1997, a several civil wars struck the Congo. The conflicts were mainly caused by the Rwandan genocide but resulted in over 3 million deaths and stills leads to social complications in the Congo today.

The average diet of the Congolese consists of starchy foods like cassava, plantains, maize, peanuts and rice, which also compose the most common crops produced for trade in the DR of Congo (ourafrika). Smallholder farms grow rubber trees, cacao, tobacco, and sugarcane as additional cash crops (ourafrika). Their diets are enriched with beans and meat from monkeys, antelope and wild pigs but this is not those forms of protein are not always certain. This meat is sometimes referred to as “bushmeat” by the local people and can become dangerous to the Congo’s wildlife if hunting is not restricted. Like said before, the Congo Basin is a complex organism comprised of many species and poaching a single species will disrupt that balance. Many young men who seek jobs can find them in poaching wildlife (ourafrika). As the population continues to grow, these hunters will become a key problem in the Basin as demand for meat rises.

Even though many subsistence farms are in active use, the demand for food in the Democratic Republic of the Congo is surpassing the supply. There are two main problems that lead to the food issue in the Congo: One cannot get the food itself and the other half other cannot afford food. The deficit for food leads to the country having to import food from other countries(ourafrika). Around 55% of the population in the Congo is below the poverty line and live on less than one dollar(USD) a day(ourafrika). As the global food prices rise, it makes it hard for the average family in the Congo to buy food. Sadly, around half of infant deaths in the DR Congo are linked to malnutrition. Deaths are often caused by a lack of vitamin A, zinc or iron the diet(ourafrika). Unsustainable farming and poor water quality are the main problems for the Congo. My way to solve the Congo’s main problem is to create a sustainable, environment-restoring system, that the locals are guaranteed all food that is produced.

The “farm” consists of 6 sections that are operated semi-independently but when working together, the farm becomes sustainable. A relatively small farm which occupies 20 acres of land in total can supply jobs and education to approximately 310 people. Each station requires little money to build and can be operated in varies parts of a town. The families can reap the benefits of the stations. The family can work, live and get an education at the same place now. The products produced in this farm will mostly be consumed by the farmers themselves but when there is large surpluses the food can be sold or donated. The government provides the raw materials that are needed but can be built easily.

The first part of the farm is a plot of land that grows strictly Jackfruit. The Jackfruit is a fruit native to southeast Asia and lives in the tropical rainforests. The tree grows up to 30m and can bear up to 250 fruits per year that weigh approximately 30 pounds. The fruit does not only grow plentiful but is also nutrient dense. It has 95 calories per 100 grams(3.5 oz)and a large amount of vitamin A and C which are necessary for the human body. The high vitamin A content meets the demand for it that many children face in this country. This versatile fruit can be boiled, turned into jelly or eaten raw. Many people even compare it to meat in texture. This could be a very promising in the future of stopping excessive poaching by giving an alternative to meat. The seeds of the fruit can even be turned into flour. The other parts of the tree such as the leaves and twigs can be used in the next station.

The most complex station is the water still. The still will provide clean, fresh water to the people but is not supposed to be used for any of the agriculture. The overall frame is a off-ground box that has a glass roof that is angled upward in the center and under the roof is a basin(hindawi). When the midday sun heats the vegetation that fills the basin, the water will evaporate and rise to the roof. Because the the roof is angled upwards, the water vapor will condense and run down into the sides in a pipe that funnels in a bucket(hindawi). The still secures water for the people and the more stills there are the more water can be produced.

The other main fruit being produced is the banana palm. Bananas are the 4th largest fruit crop following grapes, citrus fruit and apples (archive). They provide similar nutritional values as a Jackfruit with more

potassium. The palm grows relatively quick and matures in 9 months. It can be planted around the people's houses and can fit in smaller spaces around the neighborhood. One acre of banana depending on the species can supply anywhere between 21,950 to 54,8540 fruits(Archive). The banana is a versatile fruit as well. It can be boiled, dried or eaten raw. In other cultures, people even eat the peel. The palm also has another important use that just food. In case of a situation where clean water can't be attained or is too dangerous to drink, the palm's main trunk can be cut in half. The palms trunk will soon fill with water that is safe to drink. The consequence of doing this though is that that plant will probably die, depending where it is cut. While bananas produce much fruit and have many benefits, they consume around 22 pounds of nitrogen which is a lot and 4 pounds of phosphorous(archive).

Polyculture is a system of farming which utilizes multiple crops in one area of ground. Smart polyculture can keep the soil healthy and nutrient dense while providing a large amount of food. Polyculture is an idea that is needed for the sake of the people and the soil. An area of land should be devoted to grow vegetables like tomatoes, corn, cucumbers and squash. These vegetables can be a significant boost of vitamins and minerals to the Congolese people. Not to mention, they are also easy to grow and require little experience. These plants can thrive off the nitrogen rich soil that the jungle contains. When the banana palms are cut down, beans can be planted. They replace the nitrogen that the banana absorbs.

A community garden will be introduced. The garden will attract pollinators to the fruit trees and other produce. Socially it can bring together the younger generations of kids and make it fun to explore and be active in a garden. They can learn about what their parents do and get an education about the world around them. People can grow many crops of choice like berries, fruit trees or even wildflowers. The garden can even contain a beehouse, since bees are so crucial to the trees and flowers(bee.maid).

A vital part of the community will be the compost area. The compost is a bathroom and a compost that recycles the farm's biological waste. This includes: leaves, weeds, human waste and certain biodegradable trash. The compost can be broken down in varying times depending if there is a "composter in place. Worms, can compost waste in 3 to 4 months but cannot eat meat or dairy. Natural decomposition can take up to a year in average weather. The Congolese environment will most likely be much shorter because of the hot temperature and wide variety of bacteria presence. The quickest way would be to utilize the black soldier fly. This fly can get rid of waste in less than 1 month. This fly's larvae flourish in hot climates and can eat food like dairy products and meat that worms wouldn't(care2). The flies are not a nuisance either!(care2) The larvae quickly grow to a large size and are perfect for chicken feed.

One problem that the farm will face in the future is the concern about fertilizers and pesticides. The hope is to use organic materials and modern science to ensure healthy soil. Like said before, polyculture is an important goal for the community. Using a mix of polyculture and high quality compost, we will ensure that there will be no need for fertilizers and pesticides.

The Democratic Republic of Congo has several issues. The main problem that needs to be addressed is the unstable agriculture. The way to solve it is to create a communal, self sufficient, way of agriculture. This community will be produce food and provide jobs for the community that takes care of it. It eliminates pollution by reducing the waste and restores the ecosystem as well. The system of agriculture can also link the social life of the Congolese people and help solve social issues in the future. Hopefully, in the future, the Democratic Republic of the Congo can employ these strategies.

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