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Education and Biofuels in Congo

If the United States of America were only the size of Montana and only 2% of that land was designated for farming, what would our economy be like? We wouldn't be able to sustain our own people let alone have any extra goods to export. The economy simply wouldn't be strong enough to satisfy the needs of the population. This is the situation in the Central African country of Congo except they have one potential solution. In Africa, Congo is 4th in oil production in the Sub-Saharan region as well as having the 3rd highest amounts of natural gases in reserve (Nicoleau). The problem is they haven't started drilling it out of the ground. In Congo they don't need mass amounts of fuels because most individuals don't have cars. The potential for environmentally friendly biofuels as an export could satisfy the struggling economy Congo has been dealing with for many years.

The total land area of Congo is slightly smaller than Montana and only 2% of that land is cultivated each year (Congo, Rep. of the). That minor amount of farmland employs 75% of the total workforce in Congo. Most agricultural industry workers don't get paid for all their hours in the field. Instead, they might get a percentage of the crop or food in exchange for their work. The small percentage of the total workforce that does receive a solid salary is employed by the government. These employees are chosen for their jobs based on their ancestry and religious views. The job position is like an heirloom that gets passed through the generations of a family. Government officials and these government employees make up the very small portion of Congolese citizens who are rich.

A person's status in the Congolese society is based on ancestry and religious views. An individual who chooses to act against the accepted religion or participate in something that is not traditionally accepted is not viewed as a worthy individual. Citizens are expected to be part of the country as a whole rather than individuals. Every member of an average Congolese farming family is expected to do their share of the work. As I said earlier, 75% of the total workforce is employed in farming, with most of those workers doing manual labor. Usually children know the ins and outs of farming before they are old enough to attend primary school at the age of 6. Only 80% of eligible students graduate from primary school (Congo, Rep. Data). Higher level graduation rates are low since most children can only attend school for five years, just long enough to finish primary school. Advanced schooling is only attended by children from wealthy upbringings or those that are extremely intelligent. Graduation rates at higher levels have been steadily increasing during the last 5-10 years but are still not at a level that will promote great economic or technological improvements within Congo.

Congo has the advantage of raw natural resources which have not been tapped into yet. Besides natural gas, Congo is plentiful in diamonds, copper, lead, zinc, gold, platinum, tropical and specialized woods, sugar, coffee and cocoa (Nicoleau). Forestry was the leading export industry in Congo until the international oil industry began to grow and became unpredictable. Even while the forestry industry had the leading exports, transporting the raw materials to processing was very difficult and technically out dated. The fact that the majority of roads in Congo aren't paved and vehicles are not technologically advanced doesn't help the inefficient transportation system.

The gap between the city dwellers and the rural poor seems impossible to bridge. The way the employment is organized leaves much of the population without steady paying jobs. They rely on the alternative economy to make money. The alternative economy is the business that doesn't go through the government. It includes local markets, trading goods and labor/product exchanges. Things in this system

are often sold high to ensure that the vendor will finish the day with a profit. Rural residents go to the cities to buy and trade goods like clothing, fruits and vegetables, household goods and homemade crafts.

My theory on bridging this gap and uniting Congo relies on educating the farmers. The natural resources that are available and just waiting to be unlocked are phenomenal. Congo is the 4th highest oil producer in Sub-Saharan Africa and they are only the size of Montana. The rain forest has been a steady export for the country and supported the feeble economy before the international oil industry exploded. The one flaw in that industry is the transportation. Most native crops have the potential to be used in the cellulosic fuel industry.

If processing fuels locally was pursued in Congo, I believe the potential for the economy to improve is very high. The jobs alone that would be created within the processing plants would greatly improve the state of life in Congo besides the overall economy. In general, the more money people have, the more money they spend. Currently, the average person in Congo doesn't hold a job that pays a steady monetary salary, on a set schedule. Instead, they are given food or crops in exchange for their labor. Those who choose to sell these items have the opportunity to make money, but to some it is more important for their family to consume the product. Some citizens make money and some don't, just like some families have food and others don't.

Traditional African religions are based on the theory that a supreme being can be reached through one's ancestors. This 'being' is believed to take the shape of everyday inanimate objects. Emphasis is put on constant respect for ancestors and their traditions every day in Congo. Misfortunes are taken as a sign of one disrespecting his ancestors. To me this part of their culture is limiting the changes and improvements that are being made in the farming industry. Believing in ancestors is something I respect and understand but I don't understand why they must follow the same techniques their ancestors used. For religious and ceremonial situations the traditional ways are respectable and a sign of the strength of their culture but when it comes to farming and other industries technology must move forward.

I believe that in order to strengthen the economy enough to sustain its people, those people must be educated. With that in mind, farmers are using their resources but not using modern technology to improve their machinery and processing methods. They are following the techniques of their ancestors as is the traditional belief. When John Deere developed the first steel plow, he was using all his knowledge to create something that would make his work easier and more efficient. To my knowledge, Congo hasn't taken advantage of technology. Their government is stuck in a routine that keeps the budget tight and the citizen benefits low. They are trying to sustain their people, but there is no way that can happen with the current circumstances. All they need is one person to take advantage of their resources and improve the lives of the nearly 3 million residents. Just like one person, John Deere, solved a problem and started the improvements in the Agriculture industry in America in 1838.

Education and farming are two subjects that are not strongly related in Congo. With only 2% of the total land area being cultivated and employing 75% of the Congolese workforce, new methods aren't being used to the advantage of the industry (Nicoleau). While farming has never been as profitable as forestry in Congo and Central Africa, the basic techniques still leave much to be desired. In 1998, total imports were 8.5 times the total exports. The farmland isn't producing nearly enough food to even feed their own people let alone export and trade to other countries.

There are several education programs that help farmers work through local environmental issues. One of these is the Agro-forestry program that focuses on replenishing the soil with nutrients and land rotation. Local Congolese farmers are provided with seeds and seedlings that will improve soil fertility as they mature. This lengthens the life span of the soil between rotations and allows the land to be rested for shorter periods of time. These plants also improve future crop yields because of the nutrients they

contribute to the soil. While this program is improving crop land it is also reducing the clearing of rainforests to allow for more efficient farmland (Lukas).

Here in the United States we have the USDA and extension offices that work as a communication link between the government and farmers. It is unusual for a family farmer not to have contact with one of these resources. They provide us with educational resources that help farms become more efficient and profitable each year. The USDA usually offers programs that pay farmers to conserve land or control weeds and harmful plants.

Family farms in Congo are secluded between booming urbanized areas without sufficient general living resources. Residents have never heard of a paved road and it could take days to get to the city. In the rural areas, the water isn't safe to drink; most residents won't ever see a doctor and children will grow up working on the farm. The risk of a child contracting an airborne or water harbored disease is very high besides the constant risk of AIDS. The life expectancies have been improving but remain under 50 years old for men and women (Nicoleau).

Growing up on a family farm I understand how important it is for everyone to do their share of the work. On American farms everyone has their chores to do once they are mature enough to understand the importance of the operation and the jobs they are doing. In Congo, children work on the homestead as soon as they understand the steps needed to complete the task. The younger children are usually responsible for the cooking and cleaning as well as possible carrying water between huts. An average homestead is made up of several huts, one for cooking, and possibly several for sleeping depending on the size of the family. An average woman will have 3 or 4 children in her lifetime (Congo, Rep. Data). It is a common event for the homestead to be moved to the best land. If the farmer's current land is growing weak in nutritional value, the family will move the huts onto that land so that it will be fertilized from their daily living events and farm the land where the huts were previously. This is their form of field rotation.

Some of the most common crops grown in Congo are manioc, cassava (tapioca), rice and corn. All of those crops are related in the fact that they all have the potential to produce biodiesel and cellulosic fuels (Jaffe). Those crops thrive in the tropical environment of Congo and could easily be processed into cellulosic biofuels. Here in the United States, we are researching and trying to use cellulosic materials to produce biofuels. Congo could take either of two sides with their crop matter. They could export the biomass to countries that can process and use the fuel it would produce as an export or they could process the crop matter locally. Also, instead of just using raw petroleum to produce regular gasoline, they could combine their cellulosic matter into the processing of the raw petroleum to make environmentally friendly fuel. Ultimately most of the produced fuel will be exported because Congo doesn't need all that they have the potential to produce. If Congo did produce these fuels to be used in their own country, their vehicles couldn't handle it. They would have to improve their vehicles in order to use these new fuels. In my opinion, to get the economy off the ground right now, they should export the biomass or the majority of the fuels produced because they just don't have the right technology to consume the fuels themselves.

Processing the fuels locally would provide many individuals with jobs therefore securing their food supply and sustaining their family. On the other hand, it would take a lot of money and effort to build the processing plants as well as the equipment necessary to process the materials with the newest technology. Also the transportation systems would have to be reviewed and possibly replaced to fit the needs of the new processing methods and the location of the plants. Changes in the rural parts of Congo could also affect the state of the urbanized cities. Congo is one of the most urbanized countries in Central Africa so building a factory in a rural area could affect the demographics. Between 70% and 85% of the total population lives in Brazzaville or along the railroad system that crosses the country (Nicoleau). If city dwellers take jobs at a processing plant that is located in a rural area, the costs of transportation

everyday to work may not be justified by the salary received. Citizens may move into the rural area with the prospect of jobs and the establishment of the biofuel industry.

Before any progress can be made, education needs to take place. Without looking into the types of processing and the types of fuels, no decisions can be made. Sometimes it is necessary to take the chance in order to see what the outcome will be, but in this case I think there is some homework to be done. I believe it depends on the type of crops that are in surplus if any, and what the land can handle. If the land can only grow the crops that are native, then those are the options to process into fuel. If more efficient plants can be adapted to the environmental conditions in Congo, those add to the options. The more options for crops and farming techniques, the more options for processing, fuel type and uses. Education would help make decisions about each of these components in order to make the production of the fuels efficient and as beneficial as possible to the economy in Congo.

In conclusion, Congo has the resources to do great things, they just need to take advantage of their resources and educate their family farmers so that the production agriculture industry can improve. Congo is rich in natural resources that haven't even been tapped into. With education they could process these raw materials and export them rather than exporting the raw materials and paying extremely high prices for the goods. The education programs that are currently in place are solid and cover all the bases, but there could be more. The more specific programs, the better the farmers will understand their individual niches within Congo's agriculture industry.

Biofuels offer a window of opportunities to developing countries and especially in Congo because of the crops that are natively grown. With future developments with cellulosic fuels in the international biofuels industry I see great potential for countries in tropical regions. They don't have a surplus of farmland, but the native crops can be easily and quickly grown to supply the biomass needed for fuel production.

I believe that the general living conditions also account for the hardships for the total economy in Congo. If the children are only required to attend school for five years, how can we expect their parents to be educated in the specific field of farming? They are only required to know the bare minimum of the general knowledge let alone begin specialized training. Here, education is the life of a child, that is all they do, and their goal before the age of 18 is simply to succeed at school. At that point they can do what they want, continue with their education or move into the workforce. Here, it is also assumed that in the higher levels of our public education system students have spent some time in vocational programs and have some idea of what they want to do with their lives.

My solution to the economic situation in Congo is based on education. With education, I believe that they have the potential resources and could improve their situation by taking advantage of the international fuel industry. The farmers are experts in their own ways and with technology advancements and teachers, the economy could improve significantly. I believe that the only factors holding them back now include the urbanization, transportation and technology restraints. Their cultural traditions encourage them to use the techniques of their ancestors rather than moving forward with industrial changes. If the farmers could be taught new, more efficient methods they could produce much more on their small amounts of land. Since the government is steadfast in conserving the rainforests, the farmers have limited amounts of land to live on and gain profit from. With more conservation programs and more specific education programs for farmers, I believe that the whole country would benefit greatly.

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