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Brazil – Biofuels Pioneer or Social & Ecological Disaster?

The only knowledge I had about biofuels before starting this paper was that there's an ethanol plant currently under construction only 20 miles from where I live; that there was an increase in corn production in Butler County (where I reside) to supply the ethanol plants in Iowa; and the corn prices are good. I live in rural Iowa and I enjoy helping my uncle and cousin with their Iowa family farm operation during harvest season. One question I ask myself during the harvest season is: "Would any of the corn I am moving from the field to the storage bins end up at an ethanol plant?" Prior to writing this paper, I really didn't have any knowledge about what was happening with worldwide biofuel production. Unfortunately, the truth is, I also didn't know anything about "food security". The topic, "Biofuels: Promises and Implications for Food Security in Developing Countries" was an overwhelming task for me. After researching articles related to biofuel production, I realize it seems to be a complex issue when it comes to food security. I have found that the biofuel topic is controversial. Some articles state that the biofuel industry is great economically while other articles state the industry is bad for environmental reasons and fear that the biofuel cooperations will only be concerned about conserving fuel and forget about food security. The instructions for the World Food Prize Youth Institute Paper lead me to pick a region. I chose to research Brazil, which happens to be the fifth largest country in the world and is more than 3,500 miles from Butler County, Iowa.

Located in South America, Brazil is the geographically the fifth largest country in the world. It covers 3,286,488 square miles with a population of 182.7 million people. Seventy-nine percent of the population live in urban areas and twenty-one percent live in rural areas. The eastern boundary is the Atlantic Ocean with approximately 7,367 kilometers of coastline. Other countries bordering Brazil are: Venezuela, Suriname, and Guyana (to the North), Uruguay (to the south), Argentina and Paraguay (to the southwest), Bolivia and Peru (to the West) and Columbia (to the northwest). Population is dense in large urban areas along the coastline. Uniquely, the inner continent region is sparsely populated while the overall population is one of the largest in the world. The only "official" language of Brazil is Portuguese. The most commonly practiced religion is Catholicism. Brasilia is the capital of Brazil. Fifty percent of the population is poor. Brazil is second to South Africa in the world of income inequality.

The five climatic regions of Brazil are: equatorial, tropical, semi-arid, high tropic and sub tropical. The temperatures along the equator average approximately 77 degrees Fahrenheit (25 degrees Celsius), but can reach as high as 104 degrees Fahrenheit (40 degrees Celsius). Southern Brazil's climate is subtropical and the winter season is from June through August. This season is similar to Iowa's climate where temperatures can fall below 32 degrees Fahrenheit (Zero degrees Celsius). Precipitation varies throughout the regions; the average is approximately 1,000 to 1,500 millimeters per year and mostly occurs from December through April. Although the Amazon region is humid and typically has between 2,000 to 3,000 millimeters of rain each year, it also has a three to five month dry season. This dry season varies from north to south of the equator.

Brazil's environment sustains the world's greatest biodiversity. Economic and demographic growth is threatening the environmental habitats of this region. From 2002 to 2006, more than 31,000 acres have been reduced for raising cattle and wood logging. Inarguably, Brazil boasts powerful numbers regarding terrestrial vertebrates and invertebrates in the world. It has the highest primate diversity, highest number of mammals, the second highest number of amphibians and butterflies, and the fifth highest number of reptiles. Unfortunately, Brazil also has the highest number of endangered species. Some predictions indicate that by 2020, fifty percent of the species of Brazil will be extinct.

There are approximately four million farms in Brazil. Most of the farms are small, subsistence farms. The subsistence family farmers in the Northeast region make up Brazil's poorest rural populations. Women are the head of household because their husbands migrate to other parts of the country to find work. This makes the woman responsible for the family farm plus all household duties, which most often includes supplying the basic need, which is water. Discrimination of women makes the family's poverty situation worse. Child labor is also common in this region. Children ages 10-14 years old work to supplement the family income. Brazilian children have health issues. A 1998 analysis of children in the Northeast region concluded that 48 % were anemic (56% of children in rural areas and 41% urban areas). Twelve percent were found to have Vitamin A deficiency. This region has limited public services. Many families supplement their income with salaried labor and entrepreneurial opportunities such as hand crafts.

Brazilian farm families have little access to technology, infrastructure, and markets. Public services and education are not available to rural areas. The hope is that biofuel production will provide the rural farmers with new jobs, higher income improved living conditions and improvement of infrastructure. These families live on less than \$2 per day and spend fifty to eighty percent of their total household income on food. Supporters believe biofuels will generate a million direct jobs; most will be cooperatives and family businesses. Some projections point to as many as six million indirect jobs will be a result of biofuel production.

Crops of Brazilian farmers include: corn, rice, soybean, wheat, and sugar cane. Soybean production has increased from 2/10 million metric tons in 1960 to 49.54 million metric tons in 2004 and the country is second largest producer of this product. Family farms produce 65% of the of all Brazilian soybeans. Brazil produces the most sugar cane in the world. The majority of this product comes from 6 states which produces 82% of the crop. Production has grown for 56.92 million metric tons in 1960 to 547 million metric tons in 2007. In 2006 62,000 square kilometers were devoted to sugar cane production.

There have been great improvements in production, but there are obstacles to overcome. Brazilian soils tend to have toxic aluminum content. This obstacle is improving with farmers adding limestone, nitrogen and practicing no-till farming to aide in soybean production. Biotech soybeans have been legal since 2003, but farmers pay technology fees. They pay fees on seeds or when the crops are sold to the elevator. Biotech crops produce more raw materials and are more cost effective to grow. This combination is what is needed to both food and fuel production needs. Interest rates are 25 – 35%; and there are no government subsidies. Another obstacle is the lack of infrastructure.

An area of concern is the treatment of laborers. The biofuel production industry in Brazil seems impressive, until I read about how the laborers are treated. For example, some workers are trapped into slavery type conditions. In 2005, 4,133 slaves were freed during a raid of 183 farms. Brazil has very low cost in sugar cane production mostly due to labor exploitation and lack of government environmental regulations. Sugar cane production affects approximately 40,000 migrant, seasonal workers. They work in very hot conditions for long periods of time. Their pay is usually based upon the amount of cane cut each day. In 1980, the average worker cut approximately five to eight tons per day. This amount has increased to twelve to fifteen tons per day. In 2005, 416 deaths were recorded due to sugar based ethanol production. Labor practices need to be taken into consideration on the plantations.

In addition to the human conditions in biofuel production, there is an environmental concern. There appears to be contradictory information about the rain forest in Brazil. On one hand the research has stated the rainforest is affected by the biofuel production. On the other hand, research has stated that

the rainforest is not being cleared for sugar cane production. Some scientists claim the expanding crop production is eliminating the subsistence family farms.

Accountability is what is needed from government and corporations regarding the subsistence family farmer and food security. Brazil's President da Silva has an approval rating of more than sixty percent. Under his reign the Brazilian economy has grown by 3.5 percent per year which is a great improvement from the 1990's. Debt and unemployment numbers are down along with inflation. "I believe that the world will yield to biofuels" da Silva said in a September 23, 2007 interview with a New York Times reporter. President da Silva has inspired his constituents. He is from a small town and grew up poor. He obtained only a sixth grade education. He was a lathe operator at an auto plant before becoming a labor leader and politician. One huge question persists in my mind that I would like to see President da Silva address: Why does Brazil have some of the highest poverty and malnutrition numbers is the world with more than 300 biofuel plants in Brazil putting out 4.5 billion gallons of biofuels per year?

During U.S. President Bush's visit to Brazil in March, 2007, Brazil's President da Silva Lula recently said "Our biodiesel program has a major social impact. It is aimed at the small farmers to family farmers. It will help create jobs and income in the poorest regions of our country, especially in the northeastern semi-arid region, where many of these crops are actually native." Director of U.S. Department of Energy's National Renewable Energy Laboratory was recently quoted saying: "There is a huge misconception internationally that in Brazil, we're cutting down the rain forest to (make) fuels, which is not true. Done responsibly (ethanol production) does not have to (compete) with food or impact the environment." I believe that we put our trust into the hands of the leaders of our countries to make the best decisions for both our economic and environmental decisions. These leaders must be held accountable for their actions. The United Nations and U.S. Department of Agriculture have warned that the demand for biofuels has increased food prices in the past year.

On September 29th, I interviewed Bob Lewis of Des Moines, Iowa. He was formerly employed by Codistil which is one of the world's largest builders of alcohol production plants. He traveled to Piraciacaba, Brazil (which is located in the Southeast Region of Brazil) to observe labor and plant operations. The plant was built to produce 360 million gallons of biofuel each year; however the actual production was only 180 million due to the sugar cane seasonal growth. The sugar cane produced for this plant was mechanically harvested. Manual labor was hired to harvest any sugar cane that was missed by the equipment. Laborers used machetes to cut the cane. No women were employed at the plant, and he never saw any children laborers or slavery labor. Bus transportation was provided by the company for laborers to and from the work sites. The buses were always filled to capacity. Based upon his knowledge, Mr. Lewis indicated that the laborers made approximately \$400 annual for the work they performed. It was interesting to interview someone that had actually experienced and observed the operations and labor of a working ethanol plant in Brazil. I am thankful for the time and information Mr. Lewis provided to me.

Several different groups, including the corporate industry promote saving the rain forest. Cargill Corporation gave a one million dollar gift to the Nature Conservancy in 2005. The gift was for three areas: along the Mississippi River in the United States, China's Yunnan province and Brazil's Amazon region. The Conservancy stated "The relationship between Cargill and the Nature Conservancy helps advance the Conservancy's scope and breadth of its global conservation work. We applaud Cargill's vision and are grateful for it's support. This is a tremendous example of what can be achieved through effective partnerships between the private sector and conservation groups." By the time you break down a million dollar gift for three regions, the amount is \$333,333 dollars, still a large gift to be thankful for. Is it enough from a company that is the major owner and operator of ethanol production in the country;

where the cost of production is the lowest in the world? The commitment Cargill gave is a beginning of what is needed from the industries.

In 2005, Americans donated 33.5 billion dollars to help solve hunger and pollution. U.S. Government aid equaled 27.6 billion. Tracking the amount of donated money given is difficult. “People in the developed world need to take responsibility for the environmental impact of our lifestyles, which falls disproportionately on the world’s poorest.” - CARE.

About 11 years ago, John Cain Carter, a cattleman from Texas moved to Brazil and began an organization name Alianca daTerra. His belief is that providing incentives to reduce the impact on the forest can succeed where conservation efforts have been unsuccessful. The Alianca system is notable because the system can be used for virtually any market in the world. The system addresses supply chain and tracing products to where they were produced. Currently, this system is the best solution in overcoming deforestation.

Biofuels are greatly debated between scientists and ecologists. Each group has numerous comprehensive studies that weigh the pros/cons and positive/negative effects biofuel production. Regardless of which group you are partial, biofuels are definitely playing a role in our world wide energy resources and biofuels will continue play a role until the end of time.

In researching this paper, I came across a quote from President John F. Kennedy: “The world is very different now. For man holds in his mortal hands the power to abolish all forms of human poverty, and all forms for human life”. President Kennedy wasn’t referring to biofuels when he said this, but it does make you think how his statement applies to biofuel production and the state of world’s food insecurity and poverty. The world already produces enough food to feed everyone, but more than a billion people don’t have enough food for basic needs. A fair economic system could solve this problem. Biofuel production appears to have a political nudge and it is my hope that the world leaders will put an emphasis on the world food security so that the hunger will be fed and poverty stricken human beings will be helped so they can live a decent life full of dignity, pride and equality. I fear the biofuel production will forget the hungry people in the world and be blinded by the multi-billion dollar market it holds. I hope the biofuel industry will realize the impact it could have, not only on conserving energy, but on saving the world from poverty. Back here in Butler County, Iowa; every time I drive-by the ethanol plant near my home I’ll not only think about biofuel production here in Iowa and it’s implications for the state of Iowa, but also the implications of biofuel production in Brazil and the family subsistence farms and food security.

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