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## **Solving Food Instability by Removing Barriers to Markets in Brazil**

A lower middle-income country, Brazil is not most people would imagine as a developing country. In fact, it is classified as a newly industrialized country. Brazil has the strongest economy of all the Latin American countries, but Brazil has the widespread poverty of all Latin American countries. Brazil faces an extreme inequality in the distribution of wealth, which affects the number of hungry people. To solve the food instability in Brazil, a major key is infrastructure. In nearly all of the poverty-stricken countries of the world, infrastructure is not in place to allow the farmers to successfully market the work of their hands. Dictionary.com has infrastructure defined as the basic underlying framework or features of a system. In other words infrastructure is any and all things needed to make a system click (“Infrastructure”). Examples of infrastructure include and are not limited to attitude, reasoning, laws and government systems, facilities, machinery and equipment, shipping and transportation, logistics, and capital. It is not hard to compile a list of the infrastructure needed to accomplish the goal of food security in any given county or region. The difficult thing is to eliminate the reason why food security isn’t already there. As a people, Brazilians know how to grow food: they need seed, water, cooperative weather, land, a harvesting process, product distribution, and lastly, consumption. What about the other hidden necessities, such as labor and know-how? Both are factors in the production of food as well as nature when talking about agriculture. Where success is found, these necessities and hidden necessities exist somewhere. For success, they all need to be brought together—not necessarily in one area but rather in some form of network that accomplishes the goal. To explore food instability due to market barriers in Brazil, Brazilian agriculture and people will be examined. Then, the affect of Brazilian agriculture on the quality of life will be explored. Major issues in Brazil and how they affect infrastructure will also be explained. Then, recommendations to affectively address infrastructure will be addressed, followed by the role of communities, corporations, government, and other organization in addressing these faults will be shared.

### **Brazilian Agriculture and People**

The fifth largest country in the world, with its 8,514,877 square kilometers of land, Brazil is physically only slightly smaller than the United States of America (Interactive Hunger Map and Country Database). Brazil is rich in natural resources, and its biodiversity boasts rain forests, semiarid regions along the coast, mountains, rolling plains, savannahs, forests, costal lowland, and the world’s large wetland area.

Because of Brazil’s climate and topography, it has become one of the key players in international agriculture. Agriculture is a key sector of Brazilian economy, which is the largest in the world. Production of agricultural products has grown in recent years, especially in the central and southern portions. Agricultural products account for approximately six percent of gross domestic product and 36 percent of Brazilian exports.

Brazil’s population of approximately 191 million people includes 35 percent of her people living below poverty level. Nineteen percent of the population lives in rural areas, where over 50 percent live on less than \$2.00 per day. This equates to 18 million poor people, which is the largest number in the western hemisphere (Rural Poverty Portal). The poorest and most disadvantaged portion of Brazil is the northeast region, which has a semi-arid climate. Fifty-eight percent of the population of this area is poor, and 67 percent of the rural population is in poverty. The major barrier to food inequality in Brazil is the inequality of land tenure.

## *Brazilian People*

The typical family in Brazil has five to six people in it. It is of importance, though, to note the importance of family in Brazilian life. A typical family is defined as mother, father, and children. Grandparents often live in the same home, making many Brazilian homes three-generational. Brazilian families have strong ties to their extended families of cousins, aunts, uncles, and grandparents.

The typical diet of a Brazilian consists of beans, coconuts, rice, and meats. Rice is the major staple in their diet, as well as beef and other meats. There is a large diversity of fruits and vegetables produced in Brazil that are consumed by the people. Brazilians are nearly all meat eaters, and the thought of not eating meat as a main component of their diet is ludicrous to them.

Education in Brazil begins at the fundamental level, or first through eighth grades, which is free for everyone and mandatory for children between the ages of six and 14. Brazilian fundamental education is organized into nine years rather than eight grades as in the United State of America. However, only 80.5 percent of people start first grade and finish fifth grade (*Interactive Hunger Map and Country Database*). Middle education is also free, but is not mandatory. Approximately 70 percent of Brazilians pursue the three-year process. Many go into the workforce or technical skills training. Higher education is free at public universities, but it is incredibly competitive to enter. For each student entering university, 30 to 40 are not allowed. Statistically, 16.5 percent of Brazilians enter post-secondary education.

Healthcare for Brazilians is free, but it is questionable in many areas. It is most definitely limited in rural areas. Brazilian people face lack of access to clean water and poor sewage systems, as well. Despite the lack of access to healthcare, Brazilian life expectancy continues to rise while childhood mortality lowers.

## *Brazilian Farms*

Of the four million farms in Brazil, the majority is classified as subsistence level, with an average farm-size 110 hectares. Approximately 70 percent of food production is grown in a family agriculture setting. Experts agree that subsistence farming, known as family agriculture in Brazil, has the promise of lifting Brazilians out of poverty, even though the majority of poverty in Brazil is current in the rural areas.

In recent years, Brazilian government has achieved economic stability by removing price supports and subsidies. As a result of this, the coffee, sugar cane, and wheat markets have been deregulated. The experts disagree on the economic effect of this, but the one major benefit is the financial stability that it brought the economy. Brazil's economy still has a large debt load, though, which makes it vulnerable to the changing world agricultural markets. Because of this, Brazil is still classified at a "Newly Industrialized Country," rather than an industrialized country.

Major agricultural products in Brazil range from sugarcane to coffee to beef. From an international standpoint, Brazil leads the production of sugarcane, coffee, tropical fruit, and beef cattle. Brazil is an important producer of soybeans, corn, cotton, cocoa, tobacco, and forest products, as well as beef, poultry, pork, milk, and seafood.

Brazil has two distinct agriculture areas. The agricultural area of the southern half of the country has an ideal climate, good soils, technology and input use, adequate infrastructure, and experiences farmers. This area produces most of the grains, oil seeds, and export crops. The second section of Brazilian agriculture is the drought-stricken northeast region, where rainfall is not well distributed, soil is good, and infrastructure is adequate. This area contains the majority of subsistence farmers and producers of cocoa, tropical fruits, and forestry products. The main challenge of this area is not having enough food to sell to make a profit. A third, small area is the grassland where cattle are primarily produced.

At the beginning of Brazil's rise to power in agriculture, unsustainable slash-and-burn agricultural practices were in place. As the agricultural practices and economy have developed, these practices are slowly morphing into sustainable agriculture. From the slash-and-burn deforestation agricultural practices grew smallholder farms. Now, larger farms are forming as research incorporates new technology with the ideal land and mild climate of Brazil. Governmental and private research dollars have driven the switch from high yield to high quality in the nearly year-round growing season. Technology has a long ways to go in Brazil, though, to catch up to the technology of sustainable farming.

### *Major Barriers to Food Security in Brazil*

Food security in Brazil is as diverse as the topography. Although Brazil is listed as having only five to nine percent of people living in hunger according to its Millennial Development Goals, it still has pockets of extreme poverty. The poor of Brazil face many challenges in their lives, including lack of access to infrastructure and inequality in land ownership.

One of the major issues facing Brazilian agriculture is the inequality of land ownership. The richest people in Brazil own most of the Brazilian land. Brazil's agriculture sector is extremely focused on creating large farms to grow crops for exports, which is pushing smallholder farms out of business. In the 1990s, the government repealed the tax that made most agricultural exports a losing proposition. Since then, farm size has been growing exponentially. One farmer, Adilton Sachetti, owns over 170,000 acres of corn, soybean, and cotton land (Hirsch and Chu). That is large even by American standards! Because of the cost of transporting goods to the ports, many family farms are pressured into selling to the bigger farms.

Brazil's government does not use any subsidies in the agricultural commodities, which even further limits the smallholder farmers. The government removed the price supports and subsidies with "Real Plan" in the 1994 when they were working to economically stabilize the country. The plan's goal was to stabilize monetary value, adjust fiscally, liberalize trade, and privatize the economy (Meade, Valdez, and Rohen). The major affect of this, though, was reducing the ability of smallholder farmers to stay competitive. It is not likely that Brazilian government will ever use subsidies, given their reaction to the European Union regarding cotton sugar exports and the United State of America regarding cotton exports. They filed a set of complaints with the World Trade Organization saying that the two countries' use of subsidizes lowered the market value of the respective products, making the export market overcrowded.

Another major issue in Brazilian agriculture is deforestation of the rain forests, which contain the world's greatest biodiversity. The government has had to become involved in this area by preventing the sale of any crops grown on deforested land. The deforestation could seriously impact the climate by reducing rainfall, which also reduces the amount of water available for irrigation.

Brazil's government and businesses have been investing millions of dollars into research to turn the savanna scrubland into productive farmland (Hirsch and Chu). While this may increase agricultural production, the research and development cost may impede smallholder farmers from benefiting from this research.

Brazil's government has also reduced the import duty on farm equipment, seed, and fertilizer from 20 percent to 14 percent (Hirsch and Chu). While this may seem like a good thing, it truly benefits the large farmers the most. The technology of the farm equipment, seed, and fertilizer is still too cost prohibitive for the smallholder farmer in Brazil, which continues to perpetuate the food insecurity problem. The smallholder farmers needs to be able to access, at a cost effective price, the equipment and seed to grow their own food to lift themselves out of food insecurity.

Many of these issues that are faced in agricultural production in Brazil are helping the large farmer, which seem to be focused only on exports. As Vincente Paul, a leader of a Brazilian coalition of social organization worries that too much focus on exports when they need to focus on feeding its own people (Hirsch and Chu).

Although the subsistent farmers attempt to supplement their farm income, the salaried labor positions and small-scale enterprises that are available to them do not meet the financial need. In Brazil, the top 10 percent of income earners generate 50 percent of income earned in Brazil. The bottom 50 percent earns 10 percent of the income earned in Brazil (Rural Poverty Portal). Access to employment to supplement subsistence farming is very limited in the rural areas, which hold the largest pockets of disadvantaged people in Brazil. There is an average of nine percent unemployment rate in the country.

In rural Brazil, the hunger problem is based upon the insufficient purchasing power of the lowest income earners. In 2003, President Luiz Inacio Lula da Silva launched the “Zero Hunger Program” to eliminate hunger in Brazil completely. The program transfers food to those who cannot access food because of their income (Meade, Valdez, and Rosen). The estimate, according to *Brazil's Food Security and Food Assistance Programs to Reduce Poverty* report by the USDA, is that the poorest 20 percent of the population has access to only 89 percent of the food they need for survival, while the remaining 80 percent has 110 percent of the food they need for survival. In the report, authors Meade, Valdez, and Rosen indicate that subsistence farms and home gardens help lower the amount of hungry people, but they do not completely solve it. They call for an increased transfer of food through the government and better access to education to lift Brazil's people from the depths of hunger.

#### The Affect of Inadequate Infrastructure on Brazil

Infrastructure in Brazil lacks in transportation. In the 1990s, Brazil's government face economic uncertainty. In order to stabilize their economy and move forward, massive cuts were made to the budget in the 1994 “Real Plan” for Brazil (Meade, Valdez, and Rosen). For long-term stability, the government's investment into infrastructure dropped from three percent of the gross domestic product to one percent in the ten-year span from 1988 to 1998 (Brazil's Infrastructure Challenge). According to the Global Competitiveness Index, Brazil has improved the existence of infrastructure, but the overall quality of its infrastructure is poor. Brazil's economy is on a fast forward pace in growth, but this fast growth is severely straining the infrastructure of the country.

#### *Role of Transportation Infrastructure in Food Production*

Conservative estimates of the cost of transportation versus the value of the crops are 25 percent. Due to the inadequate port system, poor railways, and horrible road conditions in Brazil, a farm pays nearly one-fourth of the value of its crops in transportation. In addition, the farmer must pay for his or her inputs and labor to produce the crop. By the time the farmer pays for all of this, there is little if any value left. The money that the farmer can put into his or her own pocket is so low mass production of agriculture is not reasonable unless you are one of the mega farmers near the ports.

#### *Current Status of Transportation Infrastructure*

The most troubling area of infrastructure is transportation. Specifically, the port infrastructure and roads infrastructure are seriously behind. Air transport and railroad transport are also lacking. Brazil has over 48,000 kilometers of waterways that could be used to transport goods to market, but they are largely unutilized. Where ports and airports do exist, they are overly congested.

The most common form of transporting goods from the farmer to market for distribution and processing is by road. However, in 1990, only about 10 percent Brazil's roads are paved; those that are paved are full of potholes and/or badly in need of resurfacing that they are particularly dangerous. In 2000, a survey revealed that only 6 percent of all of Brazil's roads are paved (Brazil-Transportation). From the 1960s to 2000, the total roads paved increased dramatically, but the roads have not been properly maintained and resurfaced. The bulk of the roads in Brazil are concentrated in the southern and central region, but that region of Brazil does not suffer from the high rate of hunger (Brazil-Transportation). Over the years, road connecting the northern and northeastern sections of Brazil with the industrialized south have been built, but there is still a great deficiency in this area. A study from the early 1990s identified 28 percent of Brazil's road as in poor condition (Brazil-Transportation). The particular exception to this rule is the private toll roads, which add even more cost to transportation. Brazil's government, in an effort to reduce spending, has privatized and/or turned over the states most of the federal highway system. Hauling harvested food by road is the most costly form of transportation, yet it remains Brazil's primary form of getting goods to market. According to "How Brazil Outfarmed the American Farmer," a CNN Money article, the roads built in 1970 that went virtually unmaintained are in entire state of near collapse. Roads that are not complete muddy swamps during the rainy season and dry gully-ridden sloughs in the dry season have been swallowed up by forest. Remaining roads are pothole ridden or so narrow they are incredibly dangerous to drive. Many economists speculate that the poor condition of transportation infrastructure in Brazil is adding 25 percent or more to the cost of producing goods.

A second form of valid transportation in Brazil that is in serious decline is rail. Since 1945, there has been a steady decline of the quality. There is actually less railway now than in the 1970s, and Federal Railroad Corporation owns most of the rail, although the government has majority interest in it. The government privatized seven lines of rail transport in 1997 (Brazil-Transportation). Since rail can transport large quantities of grain and other agricultural products, investing in the rail system is a valid way to increase the efficiency of transport while reducing the cost of shipping goods.

The third form of infrastructure for transportation that would reduce the cost of shipping agricultural products is coastal shipping. Of the 36 deep-water ports, there are only two major ones: Santos and Rio de Janeiro (Brazil-Transportation). If agribusinesses were to continue to develop inland shipping and coastal shipping, larger quantities of product could be shipped reasonably. Storage at the ports is currently at a capacity of 100 million tons, but there is an immediate need for an additional 40 million tons to prevent spoilage. The additional storage would allow for storage to ride out the ups and downs of the price cycle. Both of these factors would drive up the income for farmers.

By improving transportation infrastructure in Brazil, deforestation would also be reduced. If the roads, ports, and rail transportation existed, farmers would stay in one location and farm rather than continuing in some of the slash and burn agriculture that has been happening in the past. The quality of life for a farmer in Brazil is low due to the increased cost of transportation to get their goods to market.

### *Trends in Transportation Infrastructure*

There is a bright light in Brazil's transportation infrastructure development. Between 2011 and 2014, the Brazilian government has embarked upon a plan to invest over \$562 billion in infrastructure, through the "Accelerated Growth Programme." (Leahy). However, the program is expecting to have 30 to 40 percent of the total investment to come from the private sector.

### *Increasing Food Security by Improving Transportation Infrastructure*

By improving transportation infrastructure, the amount of money coming into Brazil would increase. With more income and less expense, the Brazilian people would be able to access the nutritional food they need to pull themselves out of poverty. By easing the way for smallholder farmers, they would be

able to produce a greater market share of agricultural crops. As the smallholders would see the increased income, they would be motivated to learn to produce more efficiently and effectively, thus by increasing the supply of crops they have available to sell, and in the end, increase their income.

### Other Major Issues in Brazilian Agriculture

Brazil has seen tremendous growth in their economy in the past years, and it must be careful to not overgrow to the point of devaluation of the Brazilian real. If the economic growth is not controlled, then it will spiral out of control. Economies cycle: they have their up times and their down times. The key for Brazil is to build a stable, sustainable economy based on agriculture that will be able to withstand the bad times until the good times come again.

Deforestation must be stopped in Brazil to support a favorable environment. Although the government has taken great steps to stop this, it still needs to be addressed.

### Recommendations on Improving Infrastructure

The key to improving the transportation infrastructure in Brazil is sustainable investments, both by private and public means in it.

In order to improve the roads, there must be money available to pave and resurface the roads that lead to market. Ports must be expanded and reorganized to improve logistics of transportation. The current railway system needs to become more utilized than in past. The structure is present for the most part regarding rail; it is just highly underused.

The sensitive forest areas of the Amazon Rainforest must be secured before roads are built through the areas. Luckily, the Brazilian people realize this and have protected the area.

Ports must be developed to ship the crops, and present ports must be built stronger and have increased storage. Presently, there is 100 million ton need 40 million ton more (Hirsch-Chu). With more storage, fewer crops would spoil and be lost, creating more overall income. With more storage, the firms handling the exporting and sale of crops would be able to hold the crops during the low time to sell at a higher market value.

Brazil needs to continue working towards two main Millennial Development Goals: eradicating poverty and extreme hunger and ensuring environmental stability. Building the infrastructure to transport crops and livestock to market will address both of these goals.

### Role of Communities, Government, Corporation, and Other Organization in Improving Brazilian Infrastructure

It is said that it takes a village to raise a child. In Brazil's case, it will take a country to grow infrastructure. Each piece of Brazil's puzzle must work together to build the whole picture. Each community must demand the growth of infrastructure. They must look to themselves and what they can offer to improve their country. The government must reinstate dollars once ear tagged for the improvement of roads and transportation system. Corporations must realize the value of agriculture in the economy, and they must take the leadership to invest money, time, and talent into building the country. Other organizations, whether they are humanitarian organizations or other, must devote their time, talent, and treasure to the building up of the infrastructure. It will take the work of all of these individuals and groups to improve Brazil's infrastructure. Once the infrastructure is improved, Brazil can begin to climb out of poverty and equalize the wealth in the country.

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