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Mozambique: Removing barriers to market access through infrastructure development and supply chain innovations

As our world continues to flatten, businesses and global trade continue to flourish and expand, and innovation drives the developed world, the issue of food security continues to be an unsolved pressing issue that is arguably the largest challenge we face as a global community today. Over 2 billion people suffer from poor nutrition, 852 million people worldwide are without enough food on a regular basis, 450 million survive through smallholder (5 acres or less) farms, 10% of the world's grains are wasted due to spoilage and improper handling, and 6 million children die every year due to hunger. In Mozambique, a country of roughly 22,894,000 people, 80% of the population engages in small scale agriculture while leaving 88% of the arable land uncultivated. With the aid of improved farming technology, transportation of goods, access to adequate storage/processing facilities, and proper management/innovation of the supply chain, Mozambique can rid its hunger issues within its own country as well as create a surplus of food for neighbor countries.

The country is comprised of mainly poor, undernourished smallholder farming families. Mozambique has one of the lowest per capita GDPs in the world, ranked 172 out of 182 by the UN Development Programs index of human development. Agriculture accounts for 40% of the GNP, and 60% of the country's export revenues. Peasant family agricultural makes up 95% of the country's total cultivated farmland while these families cultivate on average 2 hectares of land. The average life expectancy according to the 2010 census is 41.18 years, and the total fertility rate is 5.13 (children born/woman). 47.8% of the population is literate, and the average time spent in school is 8 years. The main agriculture products are cotton, cashew nuts, sugarcane, tea, cassava, corn, coconuts, sisal, citrus and tropical fruits, potatoes, sunflowers, beef, and poultry.

Mozambique has gone through a number of conflicts and disasters that have set the country back to square one time and time again. 1992 called an end to the brutal civil war that encapsulated the country and set back their country's growth and development by decades. After 1992 Mozambique began to rebuild their economy and specifically the agricultural sector of the economy. The country developed roads, and returned much of the land back to small families who would tend to the land for generations to come. Within just seven years Mozambique became food independent, however, this accomplishment was to be short lived. In 2000 a series of extreme floods, and two cyclones brutally whipped away much of the advancements made within the previous 8 years, and major floods continue to devastate the country. Agricultural land, crops, homes, and roads were engulfed, and eroded from the surface of the country's land. An estimated 30% of the total cattle stock in Gaza, Inhambane, and Maputo (southern provinces) were lost with the natural disasters while displacing nearly 500,000 people due to extreme flooding. The World Bank estimated the costs of destruction to be more than US \$500 million. This series of events forced Mozambique back into a state of rebuilding, and trying to grow its economy. Although it has had one of the best performing growth rates of any sub-Saharan country, much more can be done, and needs to be done in order for the country to produce a sufficient amount of food for its own people, and even create a surplus so it can continue to develop and improve trade with other countries throughout the world to stimulate Mozambique's economy and standard of living.

Removing barriers to market access through improved infrastructure (roads, railways, markets), and more efficient supply chain innovations (product design, logistics, packaging technologies etc.) suitable for

Mozambique is the key to allow the country to maximize its plethora of resources as compared to neighbor nations in Southern Africa, and Africa as a whole. The first step to improve access to the market through improved infrastructure will be to implement new systems to better control and prepare flood prone areas so that future development is not destroyed or set back as annual floods wash through these locations. Homes and buildings need to be built on stilts with secure foundations, and farms that raise cattle need to be established on higher grounds out of the flood plains. This will prevent homes and businesses from water damage, and the loss of livestock. All agriculture in the flood plains need to be able to handle submersion in water, and fields need to have better established floodways to collect excess water and transfer it further inland in a controlled manner to relieve the extreme amounts of water flowing down river during floods. Trees, shrubs, and other plants that establish a root system thick on the surface, and deep within the soil need to be planted on the edges of roads, railways, homes, businesses, and surrounding agricultural fields. With greater vegetation, soil erosion becomes a problem of the past preventing infrastructure from crumbling or washing away. This preparation will need to be implemented in steps but all precautions will allow the citizens to have greater security within the agricultural market, and minimize losses during large floods or other natural disasters.

An increased and more secure infrastructure within Mozambique will allow the country, citizens, and organization giving aid to have greater influence on long term growth within the country. Mozambique then needs to develop a suitable supply chain that will cater specifically to the smallholders of the country. Smallholders are to then grow crops which are in high demand by global markets. A system of middle men must then be established in whose job it will be to purchase goods from the smallholders and store in proper facilities. These companies will then export their goods from the small communities they are located in to larger firms which process the raw material into a form which is able to be bought and consumed by the global market. This supply chain provides large scale national production of goods, while creating greater access to the market for smallholders, and providing income for the small scale farmers of Mozambique to improve capital, security, and standard of living.

As the supply chain becomes more efficient and effective, and money is brought into the economy, the country can continue to improve infrastructure, and establish incentives for the utilization of all available resources within the country, specifically the lumber and arable land currently not being developed and consumed. Micro financing will be an important tool as family farms work to become more efficient and produce higher yields of crops. The government will most likely need to look to foreign aid as they try to control annual flooding, and increase the infrastructure as well as make it more reliable, and durable. All of these small, but important steps will help to increase the national standard of living, promote trade and industry, and increase funds available for better education and improved infrastructure. The key is to play on Mozambique's strengths in natural resources and a large scale small-holders farming community, while focusing on the problems holding back the industry from prospering and reaching its full potential.

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