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Ethiopia, Sustainable Agriculture

Ethiopia: A Multistep Solution to the Growing Population in a Country with Untapped Agricultural Potential.

The Federal Democratic Republic of Ethiopia (FDRE) is a landlocked country in the Horn of Africa. Ethiopia has the thirteenth largest population in the world at 119,609,576 people, making it also the second largest in population in Africa (“The World Food Bank in Ethiopia”). Of that population approximately 27% (roughly 25 million) resides in an urban setting while 73% (roughly 90 million people) reside in a rural setting (“Rural Population Ethiopia”). Within the Demographic Transition Model (DTM), Ethiopia would be a stage two country. Evidence for Ethiopia being at this stage is illustrated by the Human Development Index (HDI), a composite index of life expectancy (LE), education, and per capita indicators. Ethiopia’s HDI is just 0.485, compared to more developed nations like the United States with a HDI of 0.926, this puts Ethiopia among the lowest in human development in the world (“The World Food Bank in Ethiopia”). Unfortunately, many of these problems are connected to the state’s agricultural practices. Of the 15.2% arable land contained in Ethiopia, just 1.1% is permanent crop. Farm sizes in Ethiopia are also considerably smaller than that of other nations. The average farm size in Ethiopia is 0.9 hectares (2.22 acres) compared to the United States which has an average farm size of 179.68 hectares (444 acres) (“Ethiopia – Agricultural Sector”). As Ethiopia has a high fertility rate at 4.15 births per woman, the population can be expected to rise significantly. Food insecurity is already a massive problem in the country, and with an expanding population the situation in Ethiopia could reach catastrophic levels. However, with proper growth within the agricultural sector and use of modern sustainable practices, Ethiopia can harness all of its resources and solve the adversity facing the nation.

Although over 67% of Ethiopians are engaged in agriculture, 22.4 million people in Ethiopia are lacking sufficient food consumption (“Household Population and Housing Characteristics”). This is a result of the type of agriculture being primarily practiced in Ethiopia. Subsistence farming, when farmers grow food crops to meet the needs of themselves and their families on smallholdings, is overwhelmingly practiced in Ethiopia. The normal crops grown on these subsistence farms are cereals (teff, wheat, maize, sorghum, and barley), coffee, potatoes, and sugarcane (“Nutrition Country Profile – Ethiopia”). Many Ethiopians also engage in pastoral nomadism, a form of subsistence agriculture based on the herding of domestic animals to fresh pastures. This leads to relatively high livestock population comprised of mostly cattle, sheep, goats, camel, and chickens (Levitt, Tom). Despite the high cattle population, most Ethiopians cannot afford the meat produced by the slaughtering process. Instead, they are used for their milk, something that is critical in the common diet. The majority of Ethiopians consume cereals, tubers (mostly the potato) and root crops, pulses, and oil seeds. Many of the higher priced agricultural products like red meats, certain dairy products, and even eggs are reserved for those of higher wealth in urban cities. However, even those within the urban cities are affected with food insecurity (“Nutrition: Ethiopia”). Since many of the farming done in Ethiopia is subsistence and not commercial, food prices can reach exorbitant costs, thus preventing its purchase from those in urban cities. According to The World Bank, 78.305% of Ethiopia’s population lives in rural areas. Unfortunately, electricity also is scarce in rural

areas. A total of just 45% of Ethiopians have electricity with rural populations having significantly less access (“Ethiopia Energy Outlook”). However, most of the urban population has access to electricity. Similarly, of the total population 93% of Ethiopians are without a safe lavatory (“Ethiopians Last In Line for Toilets”). However, more relevant to agriculture is water. Just 18% of the population has piped water, 40% get water from springs, 27% from rivers, and 8% from protected springs (Hawando, Tamirie). This becomes incredibly important when relating to the production of crops. Since most Ethiopians struggle to get water just for themselves, getting water for agriculture is very difficult. This means that most farmers and smallholders (a person who manages an agricultural holding smaller than that of a contemporary farm) are almost completely dependent on the rainwater and climate to bring hydration to their crops. This means that depending on the climate fluctuation of that year the yield of that year may go up or down. Generally, there are two agricultural sections within Ethiopia, the high lands which hold most of the subsistence farming, and the lowlands which is primarily used for livestock grazing. Both locations are prone to climate problems that can totally eliminate entire yields. This is paired with poor agricultural practices (“Ethiopia’s Livestock Systems”). Worse, the education in Ethiopia is unable to equip farmers and agriculturalists with the knowledge or tools to be successful. Over 67% of males and 77% of Females have no education. Additionally, less than 3% of males and less than 1% of females have completed primary school (“Household Population and Housing Characteristics”). The lack of education in the typical Ethiopian family acts as a significant barrier in the economic achievement one can make. The most substantial of these barriers is agriculture. Since the majority of Ethiopians are engaged in agriculture, most of which is subsistence or pastoralism, the entire country is locked in poverty. Simply, because they are engaged in labor intensive activity just for food, many earn little to no wage. Economic standings like this provides poor flow of the economy centering it totally around agriculture. In this way, it becomes impossible for economic growth both on the state and individual level. Severe challenges like this within agriculture prevent the growth of what could be an economically successful nation.

Ethiopia faces numerous challenges within the agricultural sector, many of which lead to severe social and environment effects. One of the largest issues facing Ethiopian Agriculture is soil degradation, the decline in soil condition and nutrients caused by improper use or poor management. Soil degradation is so rampant due the lack of modern practices and equipment used in Ethiopian agriculture. Since a large portion of the population practices pastoral nomadism, overgrazing and deforestation can cause the soil to lose all of its nutrients (Randall, Sara). Additionally, the low vegetative cover and the hot climate can easily cause desertification, the process by which fertile land becomes desert (typically as a result of drought, deforestation, or inappropriate agriculture). This is so extreme that 71.5% of Ethiopians total land area falls within the United Nations Environment Program’s (UNEP) definition of desertification (“Livestock Production Systems in Ethiopia Cattle Sector”). The environmental effects are the most obvious. Lands effected can lose intrinsic physical, chemical, and/or biological qualities either by natural or anthropic (caused by humans) processes (Nunes, Fabio). Soil without nutrition can result in diminution or even total destruction of important ecosystem functions. Through this, erosion, organic matter decline, loss of biodiversity, soil compaction, soil sealing, contamination and pollution can further affect the fertile land. In addition to the significant environment effects, the social effects can become paramount. The degradation of soil through loss of nutrients can cause poor crop yields. Since the majority of agriculture is subsistence in Ethiopia, a poor crop yield means the family may not be able to eat. Through this, famine and draught can have a detrimental effect on the population, both rural and urban. Just in the past one-hundred years, Ethiopia has suffered seven famines (Moloo, Zahra). In the famine and drought of 1983-1985, 1.2 million Ethiopian died and left 2.5 million as internally displaced peoples (IDP). Even currently, the people of Tigray (the northernmost regional state in Ethiopia) are suffering from a famine. It is recorded that about 50-100 people die a day as a result of the famine. Furthermore, there is 5.5 million people facing acute food insecurity, and over 350,000 people facing catastrophic famine conditions according to the Integrated Food Security Phase Classification (IFSPC) (“I Just Cry”).

Historically, famine and drought have been absolutely devastating, as many of the population lives in moderate or severe poverty. Ethiopians struggle from poverty and disparity throughout the country, and although the amount of poverty in the country has decreased, it has been unequal in its growth. Many in the urban cities have seen substantial growth in jobs, housing, and overall living condition, however, those in rural areas have not experienced as considerable growth. This is because those in rural areas are totally connected to the land through subsistence practices. As a result, job growth is nearly impossible, and a change in housing also cannot occur. Furthermore, and possibly worst of all, Ethiopians have very little support and little financial assistance. Without this, many people, particularly those in rural areas, are unable to grow past a subsistence-based lifestyle. This is further amplified by the lack of skilled private sector entities (“Ethiopia – Agricultural Sector”). The private sector, regardless of its connection to agriculture (agribusiness), is critical to job security, income security, and general development of a populous. Unfortunately, the business climate and competitiveness in Ethiopia has restricted growth within the private sector. Cumulatively, the challenges facing Ethiopia are numerous and deeply rooted in agriculture. Without modern sustainable practices Ethiopia’s could be stuck in this paradoxical-like problem. However, with a multi-step solution paired with untapped agricultural resources Ethiopia can sustain both its cultivation and its growing population.

Although Ethiopia has many challenges facing the nation’s agriculture, there are solutions to create sustainable agriculture to support the increasing population. The solution, however, cannot be solved in one step, rather, it will take a procedure of multiple strategies that take a holistic approach. Without a comprehensive plan, the agricultural sector will not have the resources necessary to stop a food crisis. The procedure needs to address all of the following challenges: lack of modern equipment, lack of commercialized farms, creation of an open market, lack of critical private sector development, lack of financial support, and building of prior challenges in an environmentally and economically sustainable way. The first step of the plan is to introduce new modern equipment and services. This will enhance the productivity and cultivation of farms by preventing the loss of nutrients. New equipment like pesticides and herbicides will increase production and allow more food to be cultivated. Pesticides and herbicides can reduce the amount of labor needed to cultivate plants. Furthermore, it will provide protection against the rough climate by controlling weeds. In more developed countries modern equipment such as seeders, harvesters, and pesticides has allowed for cultivation to double and even quadruple.

Furthermore, labor productivity has seen a significant increase as well. Farmers could now work less and see more economic benefit. In rural areas, subsistence farmers can produce surplus crops to begin sales for additional income. This income can subsequently increase the physical area. Ideally, this means providing more electricity and facilities to rural Ethiopians. The benefits don’t just help the subsistence farms. With the significant increase of cultivation, the supply of food will rise dramatically. This will allow the current high price of food in urban areas to decrease as well.

In addition to this, step two will want to see a shift from subsistence farming to more commercial farming. Ethiopia has an incredibly population, unfortunately, it does not have enough food to sustain this growth. To make up for the enormous deficit, Ethiopia will need to shift to a more subsistence/smallholder-based system to a more commercialized system. This will substantially increase the cultivation power of these farms by focusing on producing food in bulk rather than one’s own family. However, a problem could arise regarding the elimination of subsistence/smallholder farms for commercialized ones. To make sure no injustice is present, subsistence farmers and smallholders will have the ability to lease out their current land to commercial farms. Additionally, subsistence farmers could exchange their land for shareholder positions in the new commercial farm. This allows a systematic

fair transfer of capital from many small producers to a larger producer. These newly constructed commercial farms could also increase the stable job security many Ethiopians need. Instead of working on subsistence farms and earning a wage depending on the climate, Ethiopians can continue the agricultural work with more security. These changes would not disrupt the agriculturally driven economy, which would cause a job deficit. Furthermore, Ethiopians can gain greater knowledge and education on agribusiness, hopefully incentivizing greater technological growth.

Similarly, to the modernization of crop-based agriculture, the next step should see livestock production get massive technological assistance. The pastoral nomadism system currently dominating the Ethiopian livestock landscape does not produce enough output. Additionally, the practice is very unstable and prone to fail depending on the climate. One of the main causes of soil degradation and desertification is overgrazing. With new technology and practices not only could Ethiopia stop the catastrophic levels soil degradation, but it could also reverse them (“Livestock Production Systems in Ethiopia Cattle Sector”). To do this, an increase in the veterinary practices is needed. This will make sure the animals and livestock are raised in the best way and maximizes the product output. The best way to achieve better veterinary practices and agribusiness practice is to educate. Current pastoral nomads should be educated on the contemporary ways of livestock ranching to allow them to continue their current practice, but with a more sustainable outlook. In addition, we will want to connect the soon to be growing livestock sector with newly commercialized agriculture to promote mutual benefit. The livestock could produce manure for cheaper and more reusable fertilizer for commercial farms, and farms could provide feed for livestock.

The next step is establishing a similar linkage between the farms, ranches, and any agricultural producers to markets and value chains. Simply, there is a need to be an established trade network within the country, and outside of it. This will provide profit for the newly constructed farms, and food security for Ethiopians. This step will also address the lack of private sector in agriculture. With the new commercial farms and ranches the private sector will likely become more involved. Competition will begin among the agricultural businesses. Since many of the Ethiopians will be involved in the management of these companies, we will avoid a neo-imperialism and neo-mercantilism problem. Competition between companies will increase research and development (R&D), further creating high yield harvests. Private industry can further aid in creating a Public-Private Partnership (PPPs). A PPP is a partnership between the government or government agency and a member of the private sector. This allows easy allocation of funds to specialized projects, protection of jobs, oversight to prevent poor practices (both government and private), and boost infrastructure. Within infrastructure, irrigation is the most critical development. Due to the climate being rough and unpredictable, a steady flow of water will be necessary, especially with newly constructed commercial farms (“Ethiopia Climate and Agriculture”).

The final, and possibly most important step is funding. Simply modernizing is easy but finding the capital to support it is the difficult part. Ethiopia needs agriculture specific financial aid. This includes, micro-loans (micro-lending), crop insurance, and forward contracts. Micro-loans are a recent financial innovation that allows those with no access to credit or other banking features to get borrow-based funding. Like the name, micro-loans have little interest and are usually between individuals. Despite this, micro-loans have been able to help entrepreneurs in low-income areas. If we could get micro-loans to smallholders in Ethiopia, it's possible that the small farms could grow exponentially. Additionally, Ethiopians could benefit from crop insurance, a protection policy that will cover an agricultural producer in the event of a sudden crop failure. Policies like these are government subsidized and used to ensure farmers can recover from a failed yield. This is critical in Ethiopia because the climate creates a

significant danger towards farmers. Most commonly, in the event of a draught, Ethiopians could recover more efficiently to (hopefully) prevent a famine.

Lastly, forward contracts. Forward contracts are binding contracts that dictate a selling/buying of an asset at a specific date and time. This way Ethiopians could kickstart the agricultural sector and conduct the trade of asset and capital at a later date. This multistep solution would have to be carried out over a series of years with substantial government support. However, with the plan, support, and action, sustainable agriculture in Ethiopia can be achieved, even with the growing population.

Ethiopia is expected to have a massive growth in population despite not having the critical agricultural sector to support it. Food insecurity in Ethiopia is reaching catastrophic levels with droughts and famine happening in the contemporary. The climate and soil are rough and provide little help to solving the problem. However, a solution is not unachievable. The solution is a multistep process to counter the problem holistically. First, provide modern equipment and inputs for agriculture, then commercialize farms while protecting cultural ideals, then increase livestock modernization, then establish markets and aid in the growth of the private sector, then inject capital to fund the project. All these combined will see an exponential increase in cultivations and yields. This directly helps the rural population by producing more food, but it also helps the urban population by reducing the price of food. Additionally, it will pull Ethiopians out of insecurity and poverty by providing payment protection. The problem in Ethiopia is yet to be solved, in fact, the situation is worsening every year. However, with a solution that understands the complex nature of economics, politics and culture, it is possible to fathom a new Ethiopia, leading in sustainable agriculture.

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