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Burundi, Factor 6: Sustainable Agriculture

### **Burundi: Combating Soil Degradation through a Three-Pronged Approach**

#### INTRODUCTION:

The 1996 World Food Summit defined food security as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life.” Food security is a complex issue linked to malnutrition, sustainable development, environmental conservation, and global trade (Food Security). Our world, however, is currently battling food *insecurity*. Approximately 795 million people around the world are undernourished, with a decrease of 167 million over the past decade (The State of Food Insecurity). Despite considerable advancements, the 1974 World Food Conference resolved that all governments should fight for a day that “no child will go to bed hungry, that no family will fear for its next day’s bread, and that no human being’s future... will be stunted by malnutrition”; and thus, working with a spirit of benevolence, organizations, governments, and communities should collaborate to work towards global food security for all.

Burundi is an extremely poor landlocked republic in east-central Africa (Eggers). Since Burundi’s 1962 independence from Ruanda-Urundi, tension between the usually-dominant Tutsi minority and the Hutu majority grew until a 12-year civil war erupted (Burundi Country Profile). This ethnic-based conflict claimed some 300,000 lives and displaced hundreds of thousands into neighboring countries (Africa). A power-sharing agreement between the Tutsi government and the Hutu rebels resulted in the integration of defense forces, establishment of a new constitution, and the election of a Hutu-majority government in 2005 (Burundi Country Profile). However, this widespread ethnic violence has left the nation in a struggle to recover as it continues to face numerous economic and political challenges.

About one-half of the population is literate—a proportion lower than neighboring countries and much lower than the world average (Eggers). Six years of primary education is technically mandatory but only an estimated 50% of eligible children attend primary schools, and only approximately 8% attend the subsequent non-mandatory secondary schooling (Eggers). Many families prefer to keep their children at home to care for younger siblings or to work in the fields. Even for the students who do attend school, the quality of education in Burundi has been hindered by political instability, shortage of educational supplies, and lack of qualified teachers (Burundi).

Agriculture is a major part of Burundi’s economy and its people’s lives. Agriculture accounts for more than 40% of the Gross Domestic Product (GDP) and employs over 90% of the population (Africa). However, much of the population engages in subsistence agriculture, a system of farming that provides goods required by a farm family without significant surplus for sale (Subsistence Farming), with main staples in Burundi including beans, bananas, cassavas, sweet potatoes, maize, sorghum, and rice (Towards Greater Food Security). The average plot size is less than half a hectare, with many households living on quarter hectare plots. As the population grows and refugees that fled during the Civil War return, population density will increase and plot sizes will shrink. Many barriers to improving Burundi’s agricultural productivity lie in a combination of factors including high population density, limited arable and grazing land, and the prevalence of subsistence agriculture—only about 15% of produce is sold, with primary exports including coffee, tea, sugar, and cotton (Eggers). Another major constraint on agriculture is soil degradation, resulting from a combination of Burundi’s steep terrain and rainfall (Burundi). The degradation of soil results in lower productivity of crops and decreased arable farming land. Ironically, soil degradation is further exacerbated through overgrazing and deforestation for agricultural purposes (Eggers).

A typical Burundian diet consists mainly of carbohydrates with vitamins and minerals from fruits and vegetables. However, scarce amounts of fat and protein are available, accounting for only about 2% of average food intake (Burundi). As a result, kwashiorkor, a form of malnutrition due to lack of protein in a diet, is common (Kwashiorkor). But, kwashiorkor and other forms of malnutrition are not the only health problems plaguing Burundi.

The most common health problems originate from contagious diseases and malnutrition. Cholera, diarrhea, influenza, malaria, and measles are major causes of death throughout the country (Eggers). These diseases are often spread through contaminated drinking water and poor overall sanitation (Burundi). Although access to safe water has increased in the past decades, it is still low, especially in rural areas (Africa). Like in much of the rest of Africa, AIDS is also a major health issue in Burundi. It is evident that Burundi's people suffer from a multitude of health issues; however, with more than 80% of the population living below the poverty line (Food Security), many citizens are deprived of health care as a result of limited facilities, insufficient medical personnel, and inability to pay. Thus, this health care system is largely ineffective at handling the country's prevalent health issues.

#### KEY ISSUE:

The 2015 Global Food Security Index ranked Burundi 109th of the 109 countries examined for food affordability, availability, and quality. The decade and a half of conflict that broke out in Burundi in the 1990s hurt the country's people and economy. Since the war, Burundi has embarked on a journey towards recovery but continues to face food insecurity and nutritional challenges, evident in the fact that 60% of its population is chronically malnourished (World Food Programme). With 58% of children chronically malnourished (Towards Greater Food Security), the physical and intellectual development of hundreds of thousands is threatened (World Food Programme).

Some of the key issues in improving Burundi's food security lie in its high population density and limited land (Towards Greater Food Security). In order to conquer its state of food insecurity, they must address the current crisis while also tackling the underlying causes of the issue. Many non-governmental organizations (NGOs), including the Food and Agriculture Organization of the United Nations (FAO) and World Food Programme (WFP), and governments of More Economically Developed Countries (MEDCs) have already coalesced to help improve the current situation in Burundi, providing many immediate solutions. Many of these organizations have approached the issue of food insecurity through short-term solutions, providing those in need with food bundles or funding to purchase necessities. While this aid is extremely important, aid workers say that "much more needs to be done to ensure basic needs are addressed" regarding more long-term solutions (Towards Greater Food Security). As the Chinese proverb says: give a man a fish and you feed him for a day; teach a man to fish and you feed him for a lifetime.

In a country with such limited resources and exponential population growth, it is extremely important to produce food in ways that protect the environment, public health, community, and future generations' ability to do the same. Using such farming practices is known as *sustainable agriculture*.

A major issue in Burundi's sustainable agriculture is soil degradation, defined as "a change in the soil health status resulting in a diminished capacity of the ecosystem to provide goods and services for its beneficiaries" (FAO Soil). The World Wildlife Fund describes soil as being "the earth's fragile skin that anchors all life on earth." Because soil is a fundamental component of agricultural and essential part of environmental systems, maintaining its condition should be of top priority for those looking to improve food security in Burundi.

#### PROPOSED SOLUTION:

The USDA cited soil degradation as a “global issue for the 21st century because of its adverse impact on agronomic productivity... and its effect on food security.” The productivity of some lands has decreased by 50% because of soil erosion; and in Africa, yield reduction as a result of soil erosion may range from 2% to 40%, with an average loss of 8.2% (Natural Resources Conservation Service). Because the vast majority of the country is based on subsistence agriculture, this loss of productivity and food due to soil degradation is a direct loss of nutrition for typical families in Burundi. Addressing the issue of soil degradation involves a three-pronged approach: assessment of the current situation, implementation of mitigating techniques, and regular monitoring of the issue.

Firstly, although the current situation in Africa leaves no doubt that soil degradation is a major issue throughout the continent, little reliable data is available on the extent of the degradation in Africa (FAO Policies). In order to tackle this issue, further research on the extent of the deterioration needs to be conducted, as additional knowledge on the root causes and effects of the decrease in soil quality will lead to more effective strategies combatting this issue. A variety of technologies are available for monitoring soil erosion, including remote, airborne sensing and satellite imagery (LeRoux). Remote-sensing technology through airborne systems has increased the capacity to monitor erosion on a regional level, allowing methods such as visual imagery, stereo imagery, laser altimetry, and hyperspectral remote sensing to be utilized at smaller scales (LeRoux). However, at a national level, satellite imagery is more practical. Recent developments in technology have led to satellites that can collect higher resolution data. A more grassroots approach could allow community leaders and members of the farming community to come together at a gathering to express their observations of soil degradation. Involving the community in the fight against soil degradation provides insider knowledge and helps to break cultural barriers. All of these observation techniques can help assess the factors contributing to soil erosion throughout Burundi, allowing the development of more comprehensive techniques to battle soil degradation.

Secondly, methods to prevent future soil degradation and to restore former soil nutrients need to be implemented. Deforestation of land often leads to erosion due to lack of native plant cover. The agricultural plants that are subsequently planted on deforested lands often cannot hold onto the soil and can even worsen erosion. As the land loses its nutrients and fertile soil, farmers clear more land and the cycle of deforestation continues (Soil Erosion and Degradation). Thus, working to reduce deforestation and increase reforestation can help reverse this vicious cycle. The government could employ citizens on local reforestation projects, not only helping the environment but also improving the livelihood of its people. However, because of the limited land resources and high population density, reforestation may not be an option for Burundi. Alternatively, soil protection methods, such as installing simple retaining walls or planting grasses to prevent soil erosion, are low cost ways to prevent further land degradation. Terracing allows farmers to produce crop while practicing sustainable agriculture.

Because of Burundi's mountainous terrain, hillside farming on erodible soils contributes to soil degradation. Using proper terracing methods and appropriate soil protection methods could help prevent additional soil quality deterioration. Since much farmland is owned by families for subsistence agriculture, it is important that families and communities help implement these soil retention techniques. With the help of NGOs such as the World Wildlife Fund and the Food and Agriculture Organization, classes could be organized to educate Burundians about proper agricultural techniques. In addition, posters and pamphlets raising awareness of soil degradation could be made available in places such as marketplaces and schools. Social media announcements could also be utilized in appropriate areas throughout the country in order to educate the public on this issue. Armed with this new knowledge and funding from pertaining NGOs, Burundians could overcome the initial cost of building these terraces in order to improve future crop productivity and to maintain a healthy environment for generations to come. Because of the extreme poverty that plagues most of country, it is very important that organizations such as the United Nations Convention to Combat Desertification and the International Erosion Control Association support the movement for sustainable agriculture through their expertise and funding.

Furthermore, the research described in the first prong of this approach will hone these approaches and aim efforts specifically at the origins of the issue.

Thirdly, the need to monitor and prevent the negative results of agricultural land use, such as soil degradation, may result in the need for soil governance--the governing of soil that requires "international and national collaboration between governments, local authorities, industries and citizens to ensure implementation of coherent policies that encourage... methodologies that regulate the usage of soil resource" (FAO Soil). In the developing world, the governance of soil can be used to promote sustainable agriculture and ensure food security. After the implementation of programs and other techniques to regulate soil degradation, a collaboration of officials and citizens needs to oversee the continuation of such efforts. Additionally, oversight of these techniques through the remote-sensing technologies introduced in the first section of this proposal is key to making the sustainable agriculture movement as effective as possible. Through analysis of the effect of implementation of the methods introduced in the second prong, improvements and recommendations for the sustainable agriculture techniques could be made for future regions.

#### CONCLUSION:

Franklin D. Roosevelt once said, "The nation that destroys its soil, destroys itself." Arable soil yields nutritious produce that feeds a nation, allowing her people to lead healthy and active lifestyles. But, soil degradation threatens this. Yield reduction and nutrients in crops are reduced when the quality of the soil they grow in is degraded. In short, the heart of the problem is that soil is being destroyed and degraded at a rate that is unsustainable for Burundi. And, perhaps, one of the single biggest contributing factors to soil degradation is poverty. As the FAO put it: "The rural poor, the overwhelming majority of Africa's citizens, destroy their own environment, not out of ignorance, but simply to survive... In the context of the short-term basic needs of an individual, each decision is rational; in the long-run, the effects are disastrous." No country has ever emerged from poverty without international support (Aid for Trade). With 98% of undernourished people residing in the the developing world (Hunger), it is easy to take our privileges for granted and to forget about the 783 million people who go hungry everyday; one in nine people on Earth does not have enough food to lead a healthy, active lifestyle. When we categorize these individuals into a sector of people "we are unfortunately stuck with" (Burrows), we easily turn a blind eye. But, we cannot. These people are just fellow human beings, and we are a global family. We live in a society that is heavy on individualism and competition, but we have to realize that by lending a hand to those in need we can help build a food secure world.

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