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Education in East Africa: Reviving the Green Revolution

In order to understand how to replicate the Green Revolution, it is important to first examine the original Revolution. In the mid-1960s, Norman Borlaug and a team of scientists began developing a breed of dwarf wheat that would be resistant to many kinds of plant pests and diseases. The wheat was also two to three times more productive than normal varieties of wheat at the time. Borlaug introduced this species into India and Pakistan, which were on the verge of famine. In only one decade, wheat production had quadrupled. Today wheat production is tenfold what it was when Borlaug began his work. By 1974 India was self-sufficient in the production of cereals. Pakistan transformed its wheat production; from 3.4 million tons of wheat per year when Borlaug started to 18 million tons today. Borlaug went on to develop a high-yield rice. This rice was introduced throughout Asia and gave birth to the Green Revolution.

The success of the Green Revolution is due in large part to Borlaug's approach to introducing new crops. The first step is to develop the technology. The second step is to deploy the technology and the third step is to encourage farmers, businesses and government organizations to use the technology on a large scale. Each step should include working with and educating local farmers. In order for the introduction of new crops to be successful, it is imperative that local farmers be involved in the decisions and planning of every step. This ensures that the project will continue to thrive once the government or organization running the project steps back. Educating family farmers about how to use the new forms of crop was a vital step in the original Green Revolution, and it continues to be an extremely important aspect of fighting hunger.

The original Green Revolution would not have been a success without the education of family farmers. Teaching the farmers how to utilize the new technology was a critical step to success. This educational approach must be replicated if the world is to see a Green Revolution as successful as the first. Steps have already been taken to achieve this goal. The Millennium Development Goals, derived from the United Nations Millennium Declaration, shape the way that poverty and hunger are being addressed in the world today. These goals were approved by 189 nations in 2000 with the hope of eliminating extreme hunger and poverty by 2015. The second of eight goals states, "Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling" (UN Millennium Development Goals). Educating family farmers about new technologies and providing them with the financial support for implementing these technologies could lead to more diversified, sustainable agriculture, particularly in East Africa. Education has already been shown to have a huge impact on agricultural productivity and sustainability. According to *The State of Food Insecurity in the World 2005*, a document released by the Food and Agriculture Organization of the United Nations, a farmer with four years of primary education is almost 9 percent more productive than a farmer with no education. Every bit of education makes a world of difference in the lives of family farmers, but most families cannot afford to send their children to school. An infrastructure must be developed that allows all children to be educated.

It is important to note that the HIV/AIDS pandemic is shifting the fundamentals of East African life, making it nearly impossible to define a "typical family." HIV/AIDS is wiping out an entire generation of mothers and fathers, teachers and nurses. It is leaving behind millions of orphaned children and their grandparents to care for themselves. AIDS is a complex issue that is redefining the world of many East Africans. However, for the purpose of describing a typical East African family, we will

assume that neither parent has died of HIV/AIDS. A typical East African family living in a rural setting consists of 6-8 people. In many cases, the mother will be the only parent in the household because the father is often forced to find a job away from home to supply the family with an income. Often, the income made by the father will not even make it home to the family because he uses it for his own living. Unfortunately, while there is a definite correlation between the status and income of the mother and the nutritional status of her children, there seems to be little correlation between the income of the father and the nutritional status of his children (Young 89). Small changes in the mother's circumstances, such as receiving more education and having the ability to earn an income, can have a substantial impact on the nutrition of the child. However, the status of women often prevents mothers from improving their financial situation.

In East Africa, the mother is left to run the household. Most families living in a rural setting rely on subsistence farming to feed themselves. "Subsistence farming, by definition, produces only enough food to sustain the farmers through their normal daily activities. Good weather may occasionally allow them to produce a surplus for sale or barter, but surpluses are rare. Because surpluses are rare, subsistence farming does not allow for growth, the accumulation of capital or even for much specialization of labor. The farming family is left almost entirely without implements or goods that it cannot produce itself" (Wikipedia). This most often means that the mother is unable to produce an income herself, because she is too busy cultivating and harvesting the crops, as well as providing for the other needs of her children.

Although a few of the younger children in a typical family may be able to attend primary school, most of the older children will not have the opportunity to attend secondary school. Many families simply cannot afford to send their children to school and children are often needed at home to help with the farming. Women are at an additional disadvantage when it comes to schooling because a larger percentage of men attend school in East African nations than women. According to the 2005 UN Development Report, for every 100 men in Mozambique that can read, there are only 50 women. This is partly because the girls of a household are expected to help with the farming or daily household chores, such as fetching water, which can sometimes be over an hours walk away.

Education can improve many aspects of East African life. Perhaps the most important thing it can do is help reduce the spread of disease. Disease is perhaps the single most important factor to consider when addressing hunger in East Africa. Six million people die each year from HIV/AIDS, malaria and tuberculosis, most of them in sub-Saharan Africa. Hunger and malnutrition weaken the immune system and increase vulnerability to HIV/AIDS, malaria and tuberculosis. "In the case of HIV/AIDS, hunger and poverty drive men to become migrant labourers, women to turn to prostitution or other dangerous sexual relationships, children to drop out of school.... Recent studies confirm, for example, that young people with little or no education are more than twice as likely to contract HIV as those who have completed a primary education" (The State of Food Insecurity in the World 2005). Education about nutrition and disease would drastically reduce the number of farmers, teachers and parents that are wiped out every year from preventable diseases. Malaria attack rates can be significantly reduced by increasing vitamin A and zinc intake through supplements or improved diets. In sub-Saharan Africa, per capita economic growth is estimated to be falling by between .5% and 1.2% each year as a direct result of HIV/AIDS (Food and Agriculture Organization of the United Nations). This decline must be stopped and education about nutrition, farming technology, and general health concerns would not only reverse this trend, but ensure the constant decline of HIV/AIDS and hunger itself.

Education can help to solve several of the deepest issues of poverty. Better education for women would improve the nutrition of their children and the health of their family. Since the introduction of the UN Millennium Development Goals in 2000, much progress has been made in the area of education, but East Africa lags behind. In rural Ethiopia, for example, only 1% of girls and 1.6% of boys receive a

complete primary education (FAO). According to a recent study conducted by the Global Campaign for Education, over a period of ten years, universal primary education could save seven million young people from contracting AIDS. Another East African country, Uganda, provides a hopeful example of the impact education can have. "By introducing free primary education in the mid-1990s, Uganda succeeded not only in doubling school enrolments but also helping to reverse the tide of HIV/AIDS. With 10 million young people achieving basic literacy and receiving AIDS education in the classroom, HIV prevalence rates fell from 15 percent in 1990 to 4 percent in 2004" (The State of Food Insecurity in the World 2005, 15). As Uganda illustrates, reversing the tide of HIV/AIDS is possible, and education is the way to do it. If education rates in Ethiopia were to be improved, they would surely experience the same HIV decline.

You have to start somewhere, and that is why the Development Goals focus on primary school. However, in order for a complete Revolution to occur, it is necessary for higher education to become more readily available in East Africa. A quote from Dr. Calestous Juma, in his paper, "Reinventing African Economies: Technological Innovation and the Sustainability Transition" establishes the need for higher education as well as primary education:

The urgency of investing in higher technical education is compounded by the impact of HIV/AIDS and other infectious diseases on Africa's economic growth in general and agriculture in particular. The challenges include building human capacity and transmitting agricultural skills to succeeding generations, which underscores the urgency to expand women's access to higher technical education. Educating women in science and technology is not simply a matter of meeting legal obligations related to equality and social justice; it has a clear practical purpose of changing social attitudes and preparing the next generation to adapt to changing world conditions (Juma, 7).

International organizations and governments must promote and fund higher levels of education in developing countries. Higher education would greatly increase the benefits of a primary education. Providing higher education would increase productivity, lower disease and boost the economies of all East African countries, but a family that can't afford to send their children to primary school, certainly can't afford any higher education. This is why international organizations and governments must sponsor programs that encourage students to continue their education.

Progress is being made. The first Millennium Development Goal is to halve the number of people worldwide who live on less than \$1 a day. Although this progress is going slowly in sub-Saharan Africa, many other countries have experienced significant change. Likewise, net enrolment ratios in primary school in sub-Saharan Africa have increased from 53% in 1990 to 64% in 2004, although rural children and girls are still less likely to attend school than urban children and boys. However, the spread of HIV/AIDS continues and the sixth Millennium Goal, "Halt and begin to reverse the spread of HIV/AIDS" is not likely to occur unless serious improvements are made.

Progress comes with a price. In order to achieve the Millennium Development Goals and a second Green Revolution, the wealthy countries of the world must significantly increase their assistance. "The World Bank estimates that spending on primary education in developing countries will have to increase by around US\$35 billion per year in order to eliminate school fees, provide subsidies for the neediest families, build schools, employ more teachers and rehabilitate and upgrade existing systems" (The State of Food Insecurity in the World 2005). Many European countries have agreed to increase their annual contribution to eradicating hunger and poverty, but in order for progress to truly be made, the United States must substantially increase its foreign aid. Kofi Annan, Secretary General of the United Nations states:

We will have time to reach the Millennium Development Goals – worldwide and in most, or even all, individual countries – but only if we break with business as usual. We cannot win overnight. Success will require sustained action across the entire decade between now and the deadline. It takes time to train the teachers, nurses and engineers; to build the roads, schools and hospitals; to grow the small and large businesses able to create the jobs and income needed. So we must start now. And we must more than double global development assistance over the next few years. Nothing less will help to achieve the Goals (Annan).

One decade remains until the Millennium Development Goals are supposed to be completed, and a Green Revolution may be exactly what is needed to jump the final hurdle. Providing family farmers with the tools necessary to create sustainable agriculture would address every Goal. Now all that is needed are the resources to implement a Revolution. National governments and international organizations alike have an interest in seeing education levels rise. National governments would profit greatly because a higher level of education would ensure greater food security for the entire country. International organizations and governments would also profit because universal education would curb the constant need for aid. It would reduce the food shortages and the terrible diseases that so much money is spent on. Approaching a Green Revolution with education as the centerpiece will produce results that can only grow exponentially as more and more generations of family farmers are educated and sent out into the world.

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