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Improving Ethiopian Education with an Emphasis on Rural Areas

In Ethiopia, schooling is free and mandatory for younger students (Trines), yet most children do not stay in school. In addition to poor quality education (Trines), Ethiopia, a small country with a large rural population (World Bank), is severely affected by water scarcity, poor sanitation (Habitat for Humanity), a lack of hospitals (Marcus *et al.*), and limited electricity access (World Bank). Education and a lack of resources have far-reaching effects on the environment, Ethiopians' quality of life, and food security. Using a combination of solutions focused on different aspects of the education system can mitigate Ethiopia's biggest educational challenges.

The specific needs of Ethiopia as a country, its economic and political systems, and the average Ethiopian family must be evaluated before implementing any solutions. The Federal Democratic Republic of Ethiopia consists of nine administrative regions based on ethnicity. It is run by a bicameral parliament of officials directly elected to their positions and chosen by state councils. The parliament appoints a Prime Minister as head of government and a President as head of state (Marcus *et al.*). In 2019, Ethiopia had a population of 112,078,730 individuals, with 79 percent of the country living in rural areas and 29 percent living in urban areas (World Bank). The Ethiopian economy is highly dependent on agriculture, especially subsistence farmers, cash crop farmers, and subsistence livestock raisers (Marcus *et al.*).

Typical Ethiopian families are large, eat traditional foods such as injera, and work low-paying jobs. The average Ethiopian household includes approximately five individuals (Population Reference Bureau). Many Ethiopians live in wood and mud-brick housing with sheet metal roofs, in both rural and urban communities (Habitat for Humanity). The Ethiopian diet consists of cereals, legumes, and vegetables served with spices and sauce. Staples include injera, which is a bread made from cereals, and coffee (Selinus). The per capita income in 2017 was \$1,890 per year (Centers for Disease Control and Prevention), but that figure is merely an average. In a 2015 study performed in Ziway, the living wage was found to be 3,367 Birr per month, which is \$125, while the actual wage workers earned was 1,058 to 1,233 Birr, \$51 to \$60, per month (Melese 43). This leaves many workers unable to provide for their families.

Often, Ethiopian families lack access to education, healthcare, electricity, and other resources. The gross enrollment of children in primary school in 2015 was over 100 percent of the eligible population, meaning some overage students were enrolled, however, only 34.9 percent of students attended secondary school and 8.1 percent attended college (World Bank). Primary school education is required and free in public schools, and secondary school education is free for grades nine and ten but not later grades. As a result, most of the students who attend secondary and tertiary schools are from wealthier families in urban areas (Trines). Sanitation, healthcare, and electricity access are also issues. For example, in Woreda 8, a neighborhood in the capital Addis Ababa, over half of all individuals lack access to clean water and sanitation facilities. Many residents use public toilets or have set up their own shared by multiple households (Habitat for Humanity). In Ethiopia, only major cities have full-time physicians working at their hospitals, so traditional healing is often used instead (Marcus *et al.*). Only 45 percent of Ethiopians had electricity access in 2018, only 19 percent of individuals had internet access in 2019 (World Bank), and three-quarters of primary public schools did not have access to electricity in 2015 (Trines).

While education in Ethiopia has been improving, students face many barriers. Education was made compulsory and free for five to sixteen-year-olds, the government increased the budget for education, and Ethiopia joined the Global Partnership for Education in 2004 to receive grants to improve its education system (Boyle), which has increased the quality of education. However, there is still inadequate funding, teaching staff, facilities, and space (Marcus *et al.*). The quality of teaching is high, but there are not enough teachers and those teachers do not have sufficient resources for their students. Core classes are also taught in English, which is not teachers' or students' native language (Boyle).

Poor education more severely impacts rural communities, female students, and minorities. Rural communities generally have lower access to resources, which is especially problematic in Ethiopia because most of its population lives in rural areas. Furthermore, female students are much less likely to attend secondary school because of familial duties and other factors (Humanium). In Ethiopia, the current majority in the government, despite being a minority in the population, is the Tigray. Key disadvantaged groups include Muslims and followers of indigenous beliefs (Minority Rights International). The country has an open-door asylum policy and protects its refugees (United Nations High Commissioner for Refugees), but these individuals are more likely to experience poverty and have limited education due to their refugee status.

Many Ethiopians must over-farm their land or farm for others to support their families, leading to environmental degradation. Ethiopia's major environmental issues are water conservation and soil degradation from inappropriate land management (USAID). With poor quality education, especially in rural areas, individuals are more likely to work low-paying jobs and be impoverished. Many must work for others or farm their own land using unsustainable farming techniques to provide for their families. Additionally, increased education gives farmers knowledge regarding the environment and the long-term environmental effects of certain farming practices. Proper agricultural practices must be used because about 80 percent of Ethiopia's economy is dependent on subsistence farming (Lazaro).

A potential solution is to use products such as ClassCloud and Khan Academy as educational tools. The Indian start-up Zaya created ClassCloud, which allows schools to stream content to tablets using a local intranet network, including resources from the not-for-profit Khan Academy. Using a local intranet network means schools do not need reliable internet access for students to access online learning tools. The Carlos Slim Foundation has worked with Khan Academy in the past to make its programs more accessible to students in Mexico by changing the Khan Academy app for easier access from devices other than computers (Le). The changes made in the app for this purpose may be useful in Ethiopia. By partnering with the Ethiopian government and not-for-profit charities, a chapter of Zaya or a similar organization would increase technology access for students, which is an important component to improving education (Rehorn). To apply this solution, input from community members, students, and teachers is essential.

While ClassCloud has many strengths, it also has some weaknesses that must be addressed. ClassCloud can supply teachers with the resources they need and ease their burdens in understaffed schools without requiring internet access, which is limited throughout the country. Additionally, Zaya was more effective in India than foreign organizations because it understood the country's needs (Le). A program based in Ethiopia should have the same benefits. This solution was implemented in India, so it should be sufficient for Ethiopia's much smaller population. Khan Academy and other content can be localized to fit curriculum standards and students' ability to access materials, which the Carlos Slim Foundation proved in Mexico. Zaya hopes to work in other developing countries and teach in languages other than English

and Hindi (Le). In contrast, Zaya would need to expand significantly to serve Ethiopian students. ClassCloud and most Ethiopian schools teach in English (Boyle), but for long-term educational benefits students' native languages would need to be incorporated. Although increasing technology access improves teachers' resources (Rehorn), technology by itself will not solve other social problems impacting education, such as a lack of funding and space, and it can not replace teachers.

A second solution is to provide school lunch programs. Lunch and nutrient supplement programs have been effective in countries like China (Rehorn) and Kenya (Lomborg). One program called "A Well-Fed World" is serving children in schools closest to Addis Ababa. It does not currently serve children from rural areas (A Well-Fed World), so it or a similar program could be expanded to encompass these places. Lunch programs would promote student well-being and incentivize school attendance. These programs would be led by the Ethiopian government and A Well-Fed World, with teachers and community members as advisors. Many charities donate to improve conditions in developing countries and would make good partners. While having the government take an active role in this and similar projects would be challenging, as limited time and resources are used to address other issues throughout the county, the government plays an important role in improving education and needs to be a governing and organizing body for these processes to be successful. To reduce the burden carried by the federal government in supporting these programs, solutions can be introduced in one administrative region and then slowly expanded to others, so that it is initially handled by local leaders as opposed to the federal government. Everyday citizens can help support education by advocating for lunch programs and other solutions with their community leaders and local representatives.

This plan also has strengths and weaknesses. Ethiopia has a significant Orthodox Christian population, and A Well-Fed World accommodates students of this faith, who abstain from eating meat frequently, by supplying plant-based lunches (A Well-Fed World). In rural areas, gardens can be used to grow some of the food students eat, and students can help run them with their teachers. Teachers can also use gardens as teaching tools for class activities and a place for younger students to play. The food grown in these gardens can be produced using sustainable gardening and farming practices. Lunch programs have been used in countries that have much larger populations than Ethiopia, ensuring this solution works on a broad scale and will meet Ethiopia's needs. However, to reach isolated communities this program would need significant funding and a way to efficiently transport food and cooking materials long distances over rural roads.

A third solution is increasing electricity access. Ethiopia can model Bangladesh's plan to increase electricity production, which will also serve schools. Bangladesh has set up 88 power plants to supply energy to the country's grid (Dhaka Tribune), in addition to establishing solar systems and microgrids (Ichord). Most energy companies were financed by the private sector with some aid from the government. The country's main sources of power are oil and gas, but they also use some renewable sources (Dhaka Tribune). This solution would be led by the Ethiopian government in conjunction with private electricity companies. The government would need to give priority to schools for electricity access, as well as hospitals, clinics, other essential services, and government buildings. A committee of local leaders in areas where electricity plants are built and electricity is delivered would be established for feedback.

The plan to increase electricity production in this way has many strengths. Bangladesh is a similar country to Ethiopia, meaning Bangladesh's strategy can easily be applied. Bangladesh is relatively poor with a rapidly increasing economy and a history of conflict and climate issues (Ichord), which applies to Ethiopia as well (Habitat for Humanity). It also has a larger population size than Ethiopia (Ichord), which

means this solution will meet the needs of Ethiopia's population. Bangladesh's execution has been very successful, and the citizens' access to energy increased from 47 percent of the population in 2009 to 83 percent in 2018 (Dhaka Tribune). Ethiopia has many reserves of relatively untapped resources, including wind, geothermal, and solar energy, in addition to hydroelectricity and fossil fuels (International Trade Administration). Building electricity plants would also create more jobs.

However, this solution has some weaknesses. Most power in Bangladesh comes from oil and natural gas (Dhaka Tribune). Ethiopia can focus on renewable energy instead, which is better for the environment and human health, but this is an adaptation to Bangladesh's strategy that has not been tested in that country on a large scale. Furthermore, Bangladesh has relied on hydroelectricity to an extent Ethiopia can not (Ichord) because its hydroelectric capacity is often affected by drought (International Trade Administration). Finally, the current electrical system in Ethiopia experiences power outages, load shedding, and local shortages (International Trade Administration), which are also an issue in Bangladesh (Dhaka Tribune). Thus, following Bangladesh's suit would increase electricity access, but not entirely solve these issues.

Ethiopian families often lack access to healthcare and other resources, in addition to education. Problems with the Ethiopian education system can be remedied by introducing new technologies such as ClassCloud, establishing school lunch programs, and increasing electricity access. While the education system has been improving, many changes still need to be made, and these three solutions can be a start. Improving the education system is critical because education impacts both society and the environment. By augmenting education accessibility, the quality of life and the food security of many Ethiopians living in rural areas will improve, leading to an increased ability to invest in the environment and sustainable farming techniques.

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