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Ghana: Opportunities in Extension Education

In any country, one of the most important areas to advance social and economic development is the provision of providing access to quality education. The demand is even greater today as literacy opens the doors to countless opportunities like employment, improving quality of life, and accessing and making use of new technologies. Ghana is a country that has made significant gains in education and development, yet many of its citizens remain in poverty and suffer from hunger. Ghana has seen rising production in its agricultural sector, but its production yields are some of the lowest in the world. The infrastructure of agricultural extension education and adoption of modern production practices is weak as compared to other developing countries. I believe that Ghana and its participating partners from around the world must invest in education, training, and extension services that make possible improved implementation of sustainable and more productive agricultural practices.

Education is a major factor affecting food security in Ghana. Since the mid-1980's Ghana's impressive growth and development has made the country one the strongest performers in Africa. While Ghana's overall poverty rate has declined, the three regions in the north have seen only marginal decreases (Rural Poverty Portal). Small-scale farmers in Ghana's poor rural areas have very limited access to the resources that would facilitate a shift from subsistence farming to modern commercial agriculture. Major handicaps include lack of infrastructure, equipment for irrigation and facilities for storing and processing products. Without adequate skill development, technical assistance and educational reform, Ghana will remain stagnant or stuck in agricultural production and the ability to provide for its people.

Although agriculture production in Ghana has grown over 5% annually since 2001, this has largely been achieved by bringing new land into cultivation (Addressing). Ghanaian agriculture is dominated by small farms. Seventy percent of Ghanaian farms are less than 3 hectares (Chamberlin, Jordan). Many commodities including cocoa, maize, and cassava are produced on these farms. Most of Ghana's agriculture production takes place in areas that are very remote. Also, uncertainty about rainfall and prices further handicap the food security of these farmers. Ghana is reasonably food secure at the national level, although household food insecurity is a concern in certain regions. In the Northern, Upper East and Upper West Regions, 10%, 15% and 34% of households, respectively, are food insecure (Republic of Ghana IFAD).

Households in Ghana consist on average of 3.7 people. Forty-one percent of household members are children under the age of 15. Twenty-two percent of households have orphans or children under the age of 18 not living with a biological parent. Overall, 3 in 10 rural households have no toilet facility (Ghana). Overall, 86 % of households have improved source of drinking water. Seventy eight percent of rural households have access to drinking water. Seventeen percent of households are covered by health insurance (Ghana).

Ghanaian villages surrounding the towns and cities supply the markets and roadside stalls with produce to sell. Many people have moved to the towns to find work. But most people maintain strong links with the country. The style and appearance of villages depend on where they are located. In the south the huts cluster around trees. Along the coast the huts are made of screens woven from coconut fiber and spread out under the trees. In the northern savannah the huts are stark and unprotected from the sun. Round, thatched mud huts encircle open courtyards. Prosperous villages have several concrete one or two room homes (WORLDwrite). Rural life remains primitive. Few homes in rural Ghana have running water or

electricity. Women and girls still pound cassava root and maize with heavy mortar and pestles. Water is carried in buckets and pots from nearby streams. Washing is done by hand and cooking is usually over a fire. Most of the land is divided up between families. Families farm their plots with hand implements that have been used for generations. There is little farm machinery. When machinery has been introduced, much of the time it falls into disrepair.

On market days people travel many miles to sell their produce and buy those things they cannot produce. Conditions in the towns, though far from good, are better than the conditions in the villages. Village dwellers are unlikely to ever see a doctor. Education is limited in rural Ghana. In a prosperous village there may be a concrete schoolhouse with several teachers. Children will typically get a few hours of schooling a day and rarely make it past primary school.

Norman Borlaug, Nobel Prize winner, underlined the importance of education (American Experience).

“To me education is basic to building a better standard of living, in all kinds of ideological governments. Without exception, I would put this very high on the scale of necessity because it affects population growth; it affects the ability of the individual family to utilize their inherent abilities, to exploit them more, and in the process, to lift themselves to a higher standard of living.”

Additionally, former Ghanaian President John A. Kufuor, in his address in accepting the 2011 World Food Prize, made the point that half of the hungry people in developing countries are farming families. President Kufuor also made the point that many live on marginal lands where crops are constantly vulnerable to pests, diseases, floods and droughts. He continued, “If we can link these farmers with new knowledge and provide them with the support that allows them to make full use of it, the results can be truly remarkable” (2011 Laureate).

Low adoption of modern agricultural production technologies amongst farmers in Ghana has been identified as one of the main reasons for the low agricultural productivity in the country (Akudugu). I have learned firsthand what a difference using appropriate growing strategies can be as it pertains to specific crops. At Parkside High we grow over 75,000 vegetables and flowering plants. This past year we applied a vigorous program of plant monitoring and (IPM) strategy. Through resulting information and these applied practices we significantly reduced plant loss due to nutritional disorders, pests and diseases. I believe that if Ghana is to fully utilize its agricultural production potential it will depend on the education, innovation and adoption of appropriate agricultural practices and technology. The availability of these modern agricultural production techniques to the farmer is critical. Access to extension services is vital in promoting adoption of modern agricultural production practices. Extension services can help break the negative aspects of fear of new methods and intensive management change. Access to extension services can provide the relevant information the farmers need to secure the benefits that they are seemingly unwilling to change. I realize there are many economic, social and institutional barriers that influence the adoption of new technologies. However, I believe if the Ghanaian farmers are made a partner in the process of developing and understanding these new technologies and methods there would be a greater chance of adoption.

An example of how extension activities could be applied is in the control of root rot disease of cassava. These practices to eliminate root disease, described below, are similar to the practices we have applied in the greenhouses and garden center we students operate at our school.

Cassava is cultivated in almost all the districts of Ghana. It is the number one staple food crop for the majority of Ghanaians. Cassava is also becoming an important crop for industries because of its high starch content. Diseases and pests cause severe yield losses in all production districts. The major diseases

of the crop are African Cassava Mosaic Disease (ACMD), Cassava Bacterial Blight (CBB) and Cassava Anthracnose (CAD). Root rot diseases of cassava have become important because of the high yield losses being reported by farmers and extension agents. Complete crop failures have been reported in many farms throughout the country (Disease Guide). These rotten roots are not suitable for food or any processed product. Most farmers of cassava, I would expect, recognize the associated symptoms of root rot disease, but how many know how the disease spreads? How many know the methods of control? Control of root rot diseases can be achieved through effective farm management practices. These practices include site selection away from flooding and using well-drained soil. The farmer should use disease-resistant or tolerant varieties. Farmers should also use healthy planting material. Farmers must use good farming inspection practices to identify possible infected plants and burn infected plant debris, particularly after harvest. Farmers should also practice crop rotation and land fallow and clean all farm equipment. These practices mentioned above are not high-technology or high-investment solutions yet can show immediate and remarkable results.

Why does access to Agricultural Extension services in Ghana remain low? If agriculture is critical for economic development why are education and extension services not a national priority? Agriculture extension in Ghana has undergone many shifts. It seems that Ghana extension services shifted from purely export focused services to the promotion of food crop production sometime prior to its independence in 1957. The government shift in focus intended to modernize traditional farming practices, transfer resources and technology, and train personnel to address extension needs of peasant farmers. This Ministry approach was believed to pay more attention to progressive farmers and ignored small farmers and women (Extension). Lack of coordination and poor management together with the lack of trained extension workers called for a change. The government then adopted a United Extension Service with a train-and-visit approach to extension activities. It seems this also was ineffective in that it did not meet the needs of the farmers. In 1997 the extension activities were decentralized and were transferred to the District assemblies. It seems that the decentralization has brought much improvement, but a cluster of complications with effective implementation and coordination of agricultural programs remain. Therefore, there is a need to strengthen the collaboration between the various directorates and regional and district coordination and collaboration with research institutions and universities (Extension).

A Deputy Director of Extension at the Ministry of Agriculture, Justice Amoah, said the basic reason extension is unable to reach the farmer with best agronomic practices is the lack of funding (The Problem). Currently, there is one extension agent for every 1,300 farmers. The global standard ratio is 1:200 (New Agronomist). It has been suggested that the farmers partly fund the extension benefits they receive. This, I believe, is not reasonable considering the poverty level and current lack of resources and education available to the Ghanaian farmer. Cost recovery for extension practices will remain a matter of public policy and taxation. International funds and loans should be focused on developing the education of greater numbers of extension personnel to reach the needs of the Ghanaian farmer.

The success of the extension service also depends on how the farmers are brought into the picture (Boateng). This seems relevant to what is happening in Ghana. A recent study confirms farmers are not satisfied with extension services. Reasons assigned for low satisfaction included expensive recommendations, unreliable services, and lack of follow-up from extension agents (Boateng). I believe if extension agents developed working relationships and asked for recommendations from their constituents, some of these negative factors would be resolved. If the farmers were involved with the new technologies and strategies implemented that included the farmers' input, then they would be more likely adopt the new tools and methods.

A suggestion to break the historical gridlock between extension education and farmer adoption of practices would be to provide incentives for extension agents. A program could be adapted where there are incentives for extension workers to bring forward farmer recommendations and channel them to the

research department. It might also be useful to reward extension agents for the number of male and female farmers who adopt new technologies. Another strategy might be to increase the share of female extension agents who are more effective in reaching out to the female farmers.

While Ghana has made progress in agricultural education, serious challenges brought about by climate change will have to be prepared for and addressed. Climate change is likely to intensify seasonal and annual rainfall variation as long-term changes take place. For example, there may be floods in one year and droughts another year, all while annual mean temperatures increase (Alessandro). Climate change may create water and heat stress, outbreak of pests and diseases or harvest losses during storage and distribution. Likely consequences of climate change will be yield reductions and reduced food accessibility. Rural populations in the Upper East, Upper West and Northern regions are most vulnerable. The dry land in these regions makes them vulnerable to rising temperatures; therefore, it is critical that more investment and education in sustainable practices be implemented. Some of the suggestions include appropriate use of chemical and organic fertilizers, use of improved crop varieties, use of improved crop varieties that allocate more biomass underground, rotations with legume crops that reduce the need for nitrogen fertilizer, adoption of no-till or reduced tillage, use of cover crops, use of cover residues for mulch, and improved water management for irrigated crops (Alessandro). Ghana will have to develop strategies to cope with the stress and damage that climate change can impose. Building a climate-resilient agriculture base will help Ghana to address domestic food security as well as allow them to be a food supplier for other countries.

Extension services are most valuable to the vulnerable farmers of Ghana, much more so than aid-dependency initiatives. The best extension services would provide sustainable programs that respond to specific needs and local capacities of the farmers (Republic of Ghana IFAD). One recent program that I believe provides this framework for empowerment is the Empowering Cocoa Households with Opportunities and Education Solutions program. This program is implemented in collaboration with Winrock International and the World Cocoa Foundation. ECHOES has strengthened the cocoa growing communities in Western Ghana by expanding opportunities for youth and adults through education. The program focuses on educating farmers in production techniques, how to negotiate loans and agreements, the business aspects of cocoa farming, applying new technologies to increase yields and understanding costing and pricing calculations (World Education-Ghana). Young people and adults not only receive literacy training but practical technology and production skills. This program also provides health education as part of its curriculum. ECHOES in its first few years built community centers, set up businesses for its clients and provided trained teachers and education. I found it interesting that this program has set up agricultural clubs much like FFA, 4H and Jr MANRRS that we have at our school. It was interesting to see the number of teachers from the United States who have come to support this effort.

Farmers in remote locations do not always receive extension services because of the limited reach of the extension agents and the inability of farmers to access these services. CocoaLink is a unique program that uses low-cost mobile technology to deliver practical agricultural and social information to rural cocoa farmers in West Africa. CocoaLink is supported by the Hershey Foundation and the World Cocoa Foundation. CocoaLink enables any farmer in Ghana and Côte d'Ivoire to receive and share practical information. The program works both in cocoa farming communities where education and livelihood trainings are being implemented, as well as with institutional and government partners to enhance and complement farmer benefits. Information shared includes good farming practices, farm safety, child labor, health, pest and disease prevention, post-harvest handling, and crop marketing. This service is delivered at no cost through voice and SMS text messages. Data is also collected through the CocoaLink system for monitoring and evaluation. The program in 2014 after three years had reached 45,000 farmers in 1,800 villages. It was also evaluated and reported that this information is being applied and has accounted for significant increased yield in cocoa production (Three-Year Study). I believe this program is a model that can be used across the country for extension services.

Additionally, rice is fast becoming a staple crop in Ghana. Unfortunately Ghana's farmers lack the skills and capacity to meet the demands for rice, and as a result, Ghana imports \$500 million worth of rice from Asia each year (Dispatches). Rice farming poses challenges for the small holders of farms in Ghana. Some of the challenges in growing rice are needs for irrigation, education to maximize yields, expensive seed, labor intensity and need for expensive machinery. Rice yields of a Ghana rice farm are below the global average. GADCO, a large agricultural company, came into the country and developed large rice production fields and processing facilities. They are now the largest producer of rice in the country. What I found encouraging was that this company invested heavily in training of its future work force. GADCO also invested in research and application of sustaining farm practices. They also developed a practice of revenue sharing where profits are returned to the stakeholders in the business and community.

I believe the above examples are promising and provide models for development throughout Ghana. The key point is that the Ghanaian farmer is involved in the formation and development of future enterprise. Former Ghanaian President John A. Kufuor said in his World Food Prize speech: "Without meeting the needs of families for food, we cannot meet our wider ambitions for the world" (2011 Laureate Address). I agree. I also believe without meeting the educational needs of the farmer, Ghana will not approach what is possible in its potential to feed its families of Ghana and the rest of the world. I think that by giving the farmer access to information, technology and guiding support the results will be remarkable. The decentralization of extension efforts by the government is also promising. Where policy and program are developed along with the farmer there is greater trust and opportunity for adoption. Educational programs developed by private enterprise and tailored to specific crop production seem to be the most encouraging for widespread production gains and ongoing involvement in the communities. Additionally, large investment by organizations such as IFAD and the World Bank should support development and improvements in general education which should have an agricultural and technology focus especially in the rural areas of Ghana. Additionally, I believe the outreach to communities with education and extension should be a national priority. If this occurs, this investment in education will pay continuing dividends of rising prosperity across the nation of Ghana.

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