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### **Extension Programs for the People**

Peter Duncan Burchard wrote in “Carver, A Great Soul” that George Washington Carver once prophesied a shift from use of resources which the earth has formed through the ages, epochs, periods and eras, to the ones that we can grow within a single season. In Carver’s words, “I believe the Great Creator has put ores and oil on this earth to give us a breathing spell...As we exhaust them, we must, we must be prepared to fall back on our farms, which are God’s true storehouse and can never be exhausted. For we can learn to synthesize materials for every human need from the things that grow.”

Tanzania ranks 34<sup>th</sup> in total land area of world countries but according to the United Nations Developmental Program it ranks 159<sup>th</sup> out of 177 countries on the Human Development Index. This index is a way of measuring development by combining indicators of life expectancy, educational attainment and income into a composite statistical index. The agricultural industry will have a major role if Tanzania is to move up in this index and become a country in which the citizens can develop their potential to lead full productive lives in accordance with their needs and wants. The current state of agriculture in Tanzania is not one of strength and stability when it comes to food security. Many of the 37 million residents work in the agricultural industry but still the majority of the population survives on less than the equivalent of one US dollar a day. The struggle of these poor farmers is to use better technology and techniques to produce a more abundant food supply. This is where a research based information distribution service can be of assistance.

Tanzania has a population of 36,481,000. Eighty percent of these people farm or fish at subsistence level. A typical subsistence farm in Tanzania consists of .9 hectares (2.223 acres) to 3 hectares (7.41 acres). This land is cultivated and worked by hand and hoe. The larger farmers may have an ox and plow, but on 10% of all land in Tanzania is worked using a tractor. The small farm is a rain fed farm using no irrigation other than buckets. Women make up the main force of agricultural labor. There is little or no technology and research available to these poor farmers. These farms are subject to periodic drought. These farms produce mainly food crops such as balrash, millet, sorghum, and corn. The marketing opportunities for these farms are in the urban areas selling to private households, schools, etc. The major barriers to growth in food production are weather, lack of irrigation, and poor distribution and use of technology and information.

The urban agriculture has helped Tanzania significantly. This people living in the city produce many needed things by all living people. The place that agricultural markets are found is mainly the towns that people raise and grow vegetables. The people that produce vegetables, milk, broilers’ meat, and eggs sell to schools, hotels, hospitals, and private households.

Tanzania consists of 12,597,000 acres of total crop land of which 85% or 10,770,450 acres are in food production. The main food crops include: maize, sorghum, millet, rice, wheat, pulses, cassava, potatoes, bananas, and plantains. The other 15% of the cropland is used to produce goods that are exported. These include: coffee, cotton, cashew nut, tobacco, sisal, pyrethrum, tea, cloves, horticultural

crops, oil seeds, spices, and flowers. There is also some livestock production but it is a small source of income.

The Tanzanian government is considered one of the most stable governments in Africa. There republican government is headed by President Jakaya Kikwete. The Parliament consists of elected citizens and is a multi-party system. Like in the United States there are three branches of government, the legislative, judicial, and executive.

The government is divided into different ministries to help with the needs of the people. The Ministry for Agriculture and Food Security has determined that Tanzania has the potential for providing basic food security to the citizens by developing a sustainable irrigation system. There are water resources including rivers and lakes. The potential is there for 2471053 acres of irrigated land but currently there are only 370658 acres that are irrigated. The technical information for developing this irrigation system is available to only a few farmers. The information needs to be distributed to all farmers. Currently there is no successful system in place to do this. Not only does the information on how to irrigate need to be distributed, but information on new farming techniques and new products/technologies needs to be distributed as well.

The current government sees the need for a nationwide Extension Service. The government vision of this system has been developed. This system will look very different than the system we currently use in the United States. It will not be a monopoly of a government. Private companies, organizations, and individuals will be allowed to participate and collaborate with the government system. Where necessary the private sector will be allowed to own and manage extension services for special enterprise needs such as dairy, beef, horticulture, etc. The government would play a coordinating role.

There have been attempts to form an information and technology delivery system in the past. These attempts have met with little sustainable success. The most successful of these was the Sasakawa Global 200 initiative. This was an organization that was started by Ryoichi Sasakawa from Japan. He coordinated the fundraising efforts to provide food and medicine to 20 African countries affected by drought in the 1980's. He knew that the chronic hunger was just a visible sign of the nation's poor ability to produce food. He had seen how the "super" wheat and rice varieties developed by Norman Borlaug had changed Asia. These crops used together with proper fertilization and crop production practices had stopped famine in many Asian nations. He contacted Br. Borlaug to assist with his African initiative and Dr. Borlaug became the technical leader of the program. To assist with the politics involved in a multi-country project like this, Sasakawa brought in Former USA President Jimmy Carter. President Carter agreed to have the Carter Presidential Center in Atlanta, Georgia manage the field programs of Sasakawa's mission. The urgency to help can be summed up in Dr. Borlaug's statement at Wartburg College; "Helping African agriculture to prosper is not merely a humanitarian issue - it is a matter of enlightened self-interest. Smallholder African farmers, after all are stewards of one of the earth's major land masses. Kenyan paleontologist Richard Leakey once said 'You have to have at least one square meal a day to be a conservationist.' Aiding African farmers will not only save lives. It will also, in a uniquely literal sense, help save the earth."

The Sasakawa Global 2000 initiative was to help each country it worked with achieve food security. One of the major ways used to achieve this was to get the local country to buy into the program and assist with getting local producers to join the crop demonstration program. These producers were

considered leaders in their local villages and were people the other producers would model themselves after. This program also included putting money into a fund to help with the cost of the higher priced inputs like seed and fertilizer. The producers were able to receive these inputs at a reduced cost. The program provided each country with a few extension workers. These workers were provided with some funds to use to get the new technology and information to the producers at the grass-roots, local level. They developed demonstration plots that were large enough to show local producers the benefits of using the new seed and fertilizers. The farmers could see the results on the economic returns that these new ideas brought—yields that were two to three times higher than what was normally harvested. All local farmers were then invited to field days to see what was happening and to talk with the participating farmers on the pros and cons of farming this way. It was shown that these local producers took the information back home and implemented some of it on their farms. After a few years the program would move to a different location to demonstrate to a group of new producers. This useable education was what the Sasakawa Global 2000 project wanted to see happen. It was helping sustainable producers remain sustainable and help increase food security to the region. As Jonathan Swift once stated “Whoever can make two ears of corn or two blades of wheat grow where only one grew before, will better serve mankind and his country than the whole race of politicians put together.”

The results of this crop technology pilot program showed exciting increases in yield. The local producers and their political leaders were very happy with the results. The Sasakawa Global 2000 program was copied in many countries throughout Africa due to these impressive results. The outlook for the Sasakawa Global 2000 program turning into an African version of the Green Revolution looked bright and encouraging. In fact the results were so encouraging that many established, state-owned extension type systems were dissolved. The break down was due to the private and state sponsored donors were redirecting their money to this new, successful system. This created a change in how the products were produced and marketed. The old system became a market driven system. Where the government used to own the seed and fertilizer companies it now privatized these businesses. This led an increase in prices and inflation in many nations. Many nations devalued their money to try to control inflation. The result of this was to increase the cost of imported crop production materials.

The increases in costs were the beginning of the end of the Sasakawa Global 2000 program in many countries. The profit level was decreased on these new crops since costs were high and many small producers who had joined in the food revolution were not able to repay their operating loans. This led to the shut down of many state sponsored credit lenders. This caused many producers to abandon the new technologies since once they were deemed successful in the Sasakawa Global 2000 program they were moved out of it. This meant they had to purchase all the materials that they had been getting cheap loans for or for a reduced price. Once the profitability of the crop was lowered many of the smaller producers abandoned the expensive techniques. This caused the output of food products to decrease and the same old food security issues to arise. Some of the problems were also caused by the political leadership of the countries becoming unstable and changing.

In Tanzania, the Sasakawa Global 2000 program operated for nine years (1989-1998) and showed great promise. During that time the program developed 43, 700 demonstration plots that were 65% maize. The cooperating producer was showing the other local producers just how a good seed and fertilizer program could increase yields, increase local income, and increase food security locally and nationally. In 1985, almost 39,000 tons of fertilizer was used in the country. In 1990, over 46,000 tons were used and

the yields were greatly increased, but in 1995 this number had dropped to 27,000 tons. The increasing cost of the fertilizer was more than the local producers could afford. This higher cost was combined with the uncertain marketing and uncertain supplies of inputs to greatly reduce the ability of the local producer to fertilize. Their yields dropped and so did their income. This affected the food security of Tanzania as a nation, not just the local farmer. The Sasakawa Global 2000 program reduced their operations in Tanzania in 1998 to focus their resources on a few countries rather than the 15 or so they had been in. This left a void in Tanzania for a delivery system for new agricultural technologies.

The new direction of an extension-type delivery system in Tanzania will be irrigation. Small farmer agriculture in Tanzania is dependent on rainfall. This rainfall has been changing over the past 30 years. The patterns of rainfall have become unpredictable and the small farmers cannot rely on traditional rains to water their crops. The need for these farmers to be able to collect water and use it for irrigation is very important. This issue is a major key in sustainable small farm agriculture and food security in Tanzania. Most of the small farmers in Tanzania cannot afford the large and expensive irrigation systems but can work together to implement small scale irrigation systems. The potential for irrigation in Tanzania is great. Currently there is around 454,672 acres of irrigated land but the potential can be as high as 2,456,217 acres, but as Dr. Borlaug stated in his address at Wartburg College in 2003; "You can't eat potential!" The first step in getting small scale irrigation established is to get local buy in from the farmers and communities. The people who are to benefit from this technology need to see the benefits and costs of doing it. Once the backing for the irrigation is there then the next step will be to determine what type to use. There are many types and it will depend on the local conditions, topography, and crops produced as to which type to use. This is where a local extension service can be utilized.

Tanzania has already stated that they see a local extension system to be a combination of government and private sources. The private source could be organizations that would provide money, manpower, and/or equipment and technology. These may be the input manufacturers, charitable organizations, and educational institutions. The cooperation of all members involved will be needed to make this effort successful. Funding will need to be secured to help with small farmer loans, to employ people to help organize and operate the system, to help purchase needed equipment, and to aid in research plots. The training of the employees will be imperative for keeping the system operating. Knowledgeable men and women will be the frontline of the effort to get local producers and communities to back the program. These extension personnel will need to know about the local agriculture, the needs of the producers, and the needs of the community. They will need to determine what technologies are appropriate for the local food production system. An example would be what type of irrigation system is the best - furrow or trickle.

Trained professionals are only one need; there will also be the need for equipment and technology. This may be the most expensive part of the program. To aid in best using the limited resource, I envision local farmers banding together to help in the purchase of expensive yet necessary equipment. These local cooperatives or farmer associations would be similar to the way American agriculture functioned early in the past century with many producers owning a few pieces of equipment but all working together to assist each other in getting the job done. If many producers go together to get the small farmer loans, then the money would be able to reach more areas of the country.

I believe that a sustainable, successful extension delivery system can be organized in Tanzania. It will not be like ours in the US as it will not be the sole responsibility of the government to maintain it. Private investments from organizations, individuals, and businesses will be vital to supporting the system. It is important that this system work not only for the country of Tanzania, but for the world itself. George McGovern said it the best, "Eradicating chronic hunger is both a moral imperative and a profitable investment in the future of our planet...the cost to the world of hunger is vastly greater than the cost of ending it."

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