

Technology Initiatives to Aid Agricultural Productivity in Zambia

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Agriculture is the most important sector in terms of developing initiatives for increased efficiency and growth in the Zambian economy. The reason for this is that while agriculture only accounts for 21.7% of the GDP, it engages approximately 85% of the work force. (CIA The world Factbook) This is clearly indicative of economic inefficiencies.

The aim of this paper is to look at various areas of agriculture in which there seems to be room for improvement and to suggest measures the government of Zambia may take in order remedy the situation. Having said this, this paper is not meant be used as a definitive source on any of the below mentioned techniques or products. Rather this paper is meant to be used as a guide when enacting socio/economic policies. This role is fulfilled by demonstrating the various possibilities, and empirical evidence of the success of certain practices. Beyond this the ultimate goal is to promote not only agricultural efficiency but also economic freedom that results from a healthy and strong food source. The major areas that this paper will focus on: irrigation, planting, genetic engineering of crops, and education.

The vast majority of farmers rely on rainfall in to water their crops. When this is not the case, and farmers water their crops manually, the process is often very labor intensive consisting of a rope and bucket drawing water from shallow wells. When irrigation is implemented it is generally set up informally by individual farmers and with very little capital. The process is often spontaneous and not systematic. (Brabben) The main reason for this is a lack of knowledge about available technologies and access to those technologies. One viable option to increase productivity in a cheap but highly effective manner is the implementation of the treadle pump. This pump has already been implemented in several areas in Africa including Zambia itself to great effect.

What makes this technology so promising is that it relatively in expensive and offers large returns on the initial investment for farmers. It cost approximately 75% percent less than commercial pumps of comparable flow rate capacity. Furthermore, a cost analysis revealed that with use of the treadle pump farmers in Senegal were able to reduce the cost per cubic meter of water for irrigation by 50%. Another important advantage is that it can be manufactured out of local materials and produced in local metal shops. The impacts of this technology have been profound. Studies have found that it has made it possible to reduce irrigation time from 12 to 4 person hours/day, while allowing farmers to increase their plot size by about 40 percent. (Perry)

These results are too promising to ignore and too important to leave up to individual initiative. It is important for the government to take an active role in educating the citizenry, and in making this and/or similar technologies available to its people. It may also be worth considering subsidizing such projects, if that is what it takes for wide scale implementation. All major indicators suggest that this simple technology could

have a positive effect on the overall productivity of not only the land but also the people farming it, thus, by default, improving the overall economy of the country.

The only foreseeable problem that may arise out of this new technology is that farmers, with this increased ability to farm larger plots of land will have incentive to do so thereby allowing room for disputes over property rights to arise. However with the proper oversight and documentation this ought not prove to be a very serious problem.

The next area of analysis is planting. As a result of heavy applications of chemical fertilizers and extensive plowing, much of the land has become highly acidic and highly compacted. This has deleterious effects on crop yields. Beginning in 1996 a group of stakeholders along with government officials and private donors have been promoting a new package of agricultural practices. This new practice would include land preparation in the dry season, using ox-drawn rip lines or hand-hoe basins laid out in a precise grid of 15850 basins per hectare.(Haggblade) It would also eliminate burning of crop residue from the prior harvest, but rather retaining it , and nitrogen fixing crop rotation. There are several advantages to this new plan. This system enables farmers to plant with the first rains, also by breaking previously existing plow-pan barriers the farmers will see improved water filtration. Also the precise grid pattern will enable farmers to put fertilizer and organic materials close to plants where they will provide the optimal benefits. (Haggblade)

This coupled with the above technology of the treadle pump will improve overall productivity and result in higher yields. This new method combines already existing

technologies and resources with modern know how. Also because there are already similar initiatives in place in Zambia at the grass root level, and in the private sector, implementation would merely be a function of education initiatives. It is important that the government take an active role in promoting such programs and also to expand upon them. One major source of possible innovation is the plow or other farming tools that have not changed very much over the centuries.

Another major area the government ought to look to if optimal levels of productivity are hoped to be reached, is genetic engineering. Given the fact that agriculture makes up such a significant amount of the GDP it is imperative that this area be as effective as possible. Investments in this area though may take a significant amount of time to mature, the results would have enormous impacts on the overall production and quality of crops. There are many initiatives currently underway in various African countries, but it is important that country of Zambia invest its own resources so as to conduct research specific to its needs. The reason for this is that benefit of the genetic alterations are often specific to certain crops and soil types thus much of the work may be incompatible with the specific needs of that Zambian farmer. The World Bank estimates that half of its agricultural initiatives in Africa have failed due to a failure to consider domestic infrastructure limitations. (Kuyek)

This leads me to the final area of analysis. The government ought to support an aggressive education policy. One that will afford the farmers with the skills that they need to adopt this new technology. Ultimately it matters very little how much productivity can increase with the introduction of one product or another, or new techniques of planting and harvesting crops, if the people do not know how to implement

these innovations then farmers are actually worse off than if these things never existed. The reason is that while other nations continue to pursue such research the economic power differential will continue to grow putting the farmers at an increasing disadvantage. This would then translate into obvious negative impacts on the economy as whole.

Education also serves another very important role. It informs farmers of what works and what doesn't. In this age there is a strong push for genetically modified crops mainly because the economic impacts are so profound. However in the midst of all this development there is room for error and potentially costly mistakes. By sponsoring extensive research and adopting a program that could inform farmers of the results of these findings the government would in effect minimize the possibility of farmers implanting seeds that may not be suitable for their soil or worse yet could actually produce products that are dangerous to consume.

I am proposing a two tier educational system. The first involves a small group of highly specialized researchers working on improving very specific technologies. The second tier includes a system of disseminating this information to the farmers. This could be as simple as broadcasting the findings on the radios. Also in larger communities it may be profitable to actually send teams of experienced personnel to physically demonstrate how to implant the newly discovered technologies.

The bottom line is that there is room for improvement and that it doesn't take a large amount of resources to make a significant amount of change. As mentioned throughout the paper the government of Zambia is already taking some steps towards improving the situation, but these steps need to be backed by a fully endorsed governmental policy calling for end to the age of inefficiency, and ignorance. The hope is that with this information the groundwork has been laid down for real progress and major steps towards development, and first world status.

Works Cited

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