21st Century Agricultural Extension:

The Case of Sub-Saharan Africa

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Economic Development Case Study

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CHAPTER

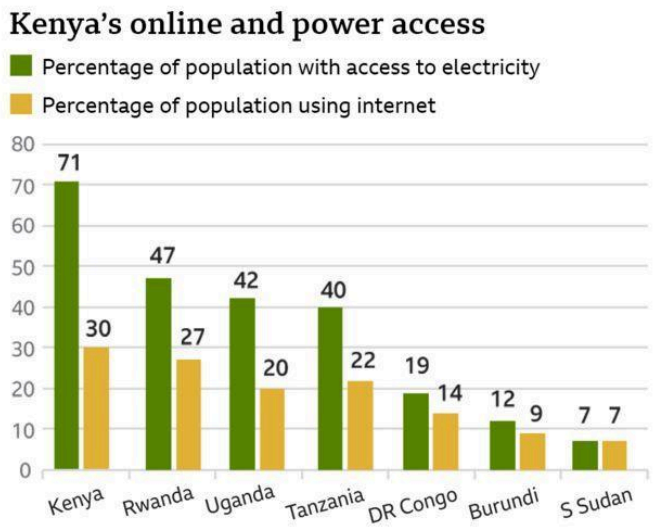
Introduction

From the earliest pursuit of national development to the growth strategies of the 21st century, agricultural extension has constantly played a vital role— accordingly, Sub-Saharan Africa is no different. Having been blessed with its abundant supply of raw commodities and its diverse climate, one could reasonably expect its growth curve to mirror other similarly profiled countries around the world. So why has this not been the case?

Well, it turns out the issues that Sub-Saharan Africa faces can be explained by their simple inability to capitalize on the same aforementioned advantages: with their lack of access to modern technology, they have failed in successfully utilizing their commodity benefits to reach the agricultural start-line, while on the other hand, their unorganized efforts at overcoming the unpredictability of their climate have been futile and prevented any semblance of a constant, dependable farming strategy. However, these problems can be mitigated with the right support, allowing Sub-Saharan Africa to overcome its weaknesses, effectively extend its agricultural base, and eventually develop as a whole.

Challenge 1 - Limited access to modern technology

Firstly, regarding the region's limited access to modern technology, it seems that a fundamental lack of infrastructure— in particular, communication infrastructure in the form of the internet—plays a critical role. Though at first glance the connection seems important but not necessarily the most explanatory of the issues observed as other socio-political failures may also explain the differences in innovation levels (such as government weaknesses in controlling corruption), the key lies in the role the internet plays in reducing research and development costs. This hypothesis implies that the agricultural countries with the most flowing lines of communication have experienced not just the greatest scientific and technological progress, but also the fastest decision-making process. Highlighting this point, within Sub-Saharan Africa itself, is Kenya. Most Kenyan farmers use traditional sources of information, such as radios, for price information in the daily market; not only does this take time, effort, and money on the smallholder farmers' parts, but also diverts their attention from pursuing technological innovation. However, with recently growing Kenyan services like M-Farm, which links buyers and sellers and provides wholesale market price information, these economic costs have been significantly reduced, which consequently has allowed these farmers to focus on technological development and strive for greater efficiency through an agricultural extension.



On the note of infrastructure, it is almost important to highlight the role of electricity since the lack of access to it further develops the notion of innovation isolation that Sub-Saharan Africa has been experiencing. Referring once again to the example of the rare success of Kenya, we observe that around 71% of their population has access to electricity compared to the 28% average of their neighbors. Once again, without the tools to coordinate research and development with each other, most of the region remains unable to utilize economies of scale, explaining the lack of fundamentals for these individual, smallholder farmers to begin innovating the machinery necessary for an agricultural extension.

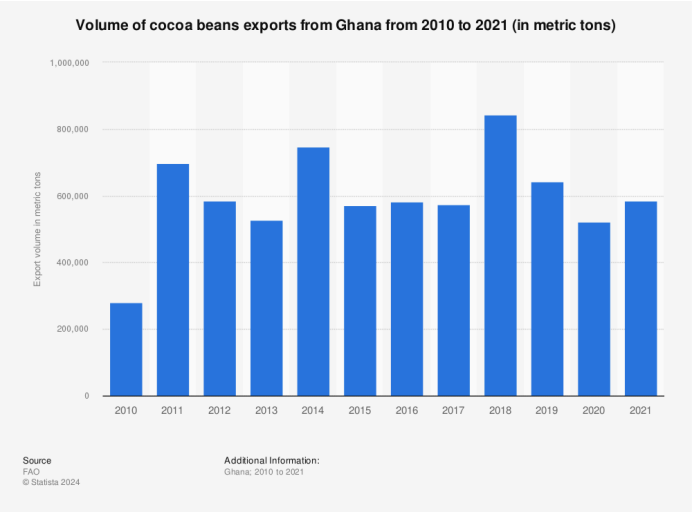
Solution 1 - Establishing agro-processing centers

In line with the details of the challenge discussed previously, the obvious flow of thought would imply focusing efforts on improving online lines of communication, whether it is through increased government expenditure to build cellular towers or expanding electricity access. However, here it is vital to consider the socio-political aspect loosely mentioned earlier as these types of solutions would leave the success of agricultural extension completely contingent upon the already vulnerable government systems of Sub-Saharan Africa. Instead, by perhaps focusing on the establishment of agro-processing centers— a much easier task than a complete rebuild of a country's infrastructure network—the goal of agricultural extension may see more success. For example, South Africa has been successful in providing small-scale crop farmers with agro-processing training. As a result, the large South African unemployed workforce has been largely capitalized on, not only increasing the rate of productivity and innovation, but also achieving economic development goals such as greater income and food security, sustainable growth, and poverty reduction. Therefore, even though this solution does focus more on improving the offline forms of communication, creating centers in each local district would allow these isolated farmers to share not only physical resources, but also their new ideas and, if incentivized correctly through perhaps agricultural production quota rewards, foster innovation.

Additionally, the fact that this solution can be implemented through public-private partnerships is a strength as it removes the necessity for the aforementioned complete dependency on the vulnerable government's funding. If successful, it would also not be far-fetched to argue that, with this support over time, these smallholder farmers would eventually be able to provide in-house capacity for provisioning agricultural extension activities and thus become self-sufficient for their innovations.

***Solution 2* - Technology adoption with greater market access**

It is also arguable that focusing on a purely domestic solution like the agro-processing center is not possible due to the already limited success seen with similar measures implemented in Sub-Saharan Africa, and thus a more international approach involving direct technology adoption from more innovative countries may be more productive. An effective tool for this would be international organizations like the International Fund for Agricultural Development (IFAD) which facilitates farmers' access to new technologies and strategies like the "best-bet agronomic practices" and "post-harvest management" developed in the United States. However, similar to the conflict of interest present in governments, the political nature inherently present in such international organizations means that they are oftentimes subservient to the directives of the governmental parties involved. Hence, in order to solve more problems than cause, these organizations need to provide aid while still abiding by existing power dynamics, land distribution, and economic priorities of a country for their input to have the most impact.



Following, a secondary advantage of this solution is that it also allows the incumbents of this technology adoption to be more competitive when they eventually do begin accessing the global innovation market after developing past the agricultural stage. Exemplifying the necessity of this is Ghana, a primarily cocoa exporter, which raked in heavy international support in expanding its market access, but faced only limited success due to its lacking supply of technological innovation to keep itself competitive against developed industries in Germany and the Netherlands. Thus, even though this solution is weak to an uncooperative international structure, its advantageous nature in being independent of the weak government structure present in Sub-Saharan Africa as well as providing a more competitive foothold in the region's main markets proves it to be a solution to consider.

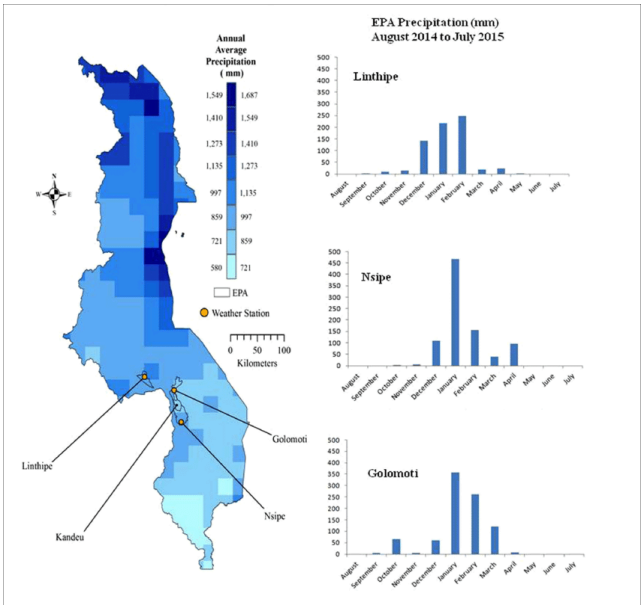
***Challenge 2* - Susceptibility to unpredictable climate**

Secondly, regarding farms' susceptibility to unpredictable climate, it is important to understand how Sub-Saharan Africa's success swings on both ends of the success spectrum. When favorable, the region sees tremendous output from its agricultural fields. But, when nature works against them, which occurs more often than not, millions are left hungry and displaced not just from their work, but from their homes, friends, and families. This is detrimental to the goal of agricultural extension since, to improve it, one has to first have a dependable agricultural strategy. Moreover, this could explain how other similar regions don't have as much difficulty in agricultural extension as, even though they may face considerably worse economic conditions compared to Sub-Saharan African countries, they have a relatively fixed set of physical conditions that allow them to specialize and personally tailor their farming strategies accordingly.

For example, Afghanistan: while the Global Climate Risk Index in 2019 has reported Afghanistan to rank 26th amongst the countries most affected by extreme weather events (in addition to the years of war and political instability the country has suffered through), farmers have still been able to overcome climate risk adversaries through several strategies. From globally-used strategies like crop diversification (a mix of traditional and more resilient crop varieties), to much more Afghanistan-tailored strategies such as the use of traditional underground irrigation systems called “karez” which are specifically compatible with their water-scarce, arid environment. Thus, instead of focusing on a strict set of methods to abide by, due to their varying climate, Sub-Saharan African countries must also employ varying strategies such as relying on more complex data-driven decision-making or adhering to conservative agriculture policies to design farming strategies in order to achieve agricultural extensions.

Solution 3 **- Climate-smart agriculture**

As mentioned earlier, one of these possible climate risk mitigation strategies could be the promotion of climate-smart agriculture with the help of complex data-driven decision-making. Essentially, this involves taking a much more calculated approach to building farming strategies, aiming to counteract the negative externalities of a constantly varying climate instead of simply relying on historical agricultural trends as is commonly done by smallholder farmers. This would include the collection of various forms of data: analyzing weather indexes, geographic information system mapping, early warning systems, etc. Accordingly, compared to the traditional seasonal-based crop strategy (change crop used every season) in countries with predictable climates, this strategy is more expensive, complex, and often overwhelming for smallholder farmers to implement.



Therefore, this creates a consequential need for strong institutions that can enforce said policies, whether that be domestic through the previously mentioned public-private partnerships or international with global organizational support. Evidencing this is Malawi, a leader in tackling this climate unpredictability problem in Sub-Saharan Africa. Though their efforts in promoting climate-smart agriculture had begun in the late 90s with the establishment of NASFAM, it was only in recent years that the organization had been able to coordinate effectively with the Malawi finance ministry and the aforementioned IFAD to enforce CSA policies such as agroforestry, weather index computation, promotion of climate resilient crop varieties, and conservative agriculture— slowly, but surely, extending its agricultural base.

Conclusion

The aforementioned key issues are ones that all developing nations need to address as improving environmental and economic sustainability can help increase production, close the income gap, reduce social disparity, and build an overall better future for generations to come. Case and point, with Myanmar, misgovernance and lack of proper laws left the population vulnerable to natural disasters and economic downturn, while in Kenya, low education availability and unrestrained corruption have hampered their potential growth. Fortunately, steps are being taken to rectify these detrimental issues in the form of new conservation and anti-corruption laws which, if proven effective, will also serve as positive examples and provide hope for other countries in similar predicaments as they work to create a brighter tomorrow.

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