

THE ENDURING FOOD INSECURITY AMONG RURAL SMALLHOLDER FARMERS: HOW CAN KENYA SPUR AGRICULTURAL PRODUCTIVITY IN RURAL AREAS?

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Abstract: Majority of the poor and food insecure in Africa live in rural areas, and most of them depend on agriculture for their livelihoods. In Kenya, smallholder farmers working in rural areas dominate agribusiness in the country, but are the most marginalized in terms of receiving inputs and support from the government. They lack access to well-functioning markets and poor infrastructure causes them to lose their perishable input before it even gets to the markets, making them more food insecure. Effective and active participation of the Kenyan government in collaboration with other stakeholders could be the best solution for spurring agricultural productivity in the rural areas. This article therefore seeks to address some complexities of food insecurity as well as highlight issues affecting rural smallholder farmers in Kenya, providing a comprehensive situational analysis, and making recommendations on how Kenya can spur agricultural productivity amongst rural smallholder farmers.

Keywords: food insecurity, small-holder farming, rural areas, agricultural productivity.

1. INTRODUCTION

Food security is firmly established in the vocabulary of policy and science. The expression has been defined and used for years, perhaps most succinctly by the United Nations' (UN) Food and Agriculture Organization (FAO) to mean “*access by all people, at all times, to the food needed for a healthy life*” (Powledge, 2010). Tweeten (1997) notes that food security is comprised of three components: food availability, access, and utilization. To claim that food security has been achieved there must be a reliable supply of food, and individuals must be able to acquire it and derive nutritional well-being from it (Scanlan, 2003).

According to the United Nations, about 26.4 million people are displaced annually by climate and weather-related disasters which are proving to be a challenge towards food security. The statistics further indicate that 75% of the world's poor and food insecure depend on agriculture and natural resource-based livelihoods (UN-HABITAT, 2006). Additionally, during this year's celebrations to mark World Food Day, the Food and Agriculture Organization (FAO) noted that more than 75% of the world's poor and food insecure depended on agriculture and natural resource-based livelihoods (FAO, 2017).

Majority of the poor and food insecure in Africa live in rural areas, and most of them depend on agriculture for their livelihoods. More than 30 percent of the people in Sub-Saharan Africa are chronically hungry and are small farmers (FAO, 2016). Experts tell us that the population in Africa is expected to double by 2050, and African nations will have to double their food production just to keep pace with population growth. For the last 20 years, however, food production in Africa has lagged-behind population growth, and the source of the problem has been low productivity on Africa's farms.

In Kenya, agriculture is the main economic activity and majority of its population relies on it for their source of livelihood, especially those who live in the rural areas; therefore, it is the largest employer in the economy. Kenya has over 7 million small holder farming families and these are the farmers that feed majority of the Kenyan urban population. However, they are the most vulnerable group to issues like agricultural policies, market price fluctuations and the ever-changing climate (Keatinge, 2010).

Smallholder farmers working in rural areas dominate agribusiness in the country, but are the most marginalized in terms of receiving inputs and support from the government. Inadequate understanding and poor documentation of factors related are some of the challenges facing smallholder farmers in decision making to improve farm productivity and food security (). Such challenges are prominent in the rural parts of the country and this puts these farmers and their output at risk daily. For a country that is predominantly reliant on agriculture, Kenya should have made significant advances in technology and fostered long lasting partnerships in ensuring that the farmers who contribute to the country's stable GDP are given priority when decisions encircling agriculture are to be made.

This article therefore seeks to address some complexities of food insecurity as well as highlight issues affecting rural smallholder farmers in Kenya. It will provide a comprehensive situational analysis, making recommendations on how the Kenyan government and other stakeholders can spur agricultural productivity amongst rural smallholder farmers.

Theoretical Arguments:

Neo-Malthusian perspectives begin discussions on food security with ecological concerns of population pressure and the ability of the earth to feed the planet, warning of doomsday scenarios from unchecked population growth and consumption of the earth's resources (Scanlan, 2003). Food security can be maintained only by achieving a sustainable society that meets the needs of the human population without compromising those of future generations, thus balancing human needs with the earth's capacity to meet those needs without doing unrecoverable environmental damage (Scanlan, 2003).

Modernization theorists like Rostow (1962) claim that Less Developed Countries should 'modernize' by following the path taken by industrialized societies to achieve economic and social well-being (Scanlan, 2003). Less-industrialized societies should boost their rate of savings and capital investment and establish modern institutional structures such as a rationalized government, expanded citizenship, urban centers, and an educational system that creates a literate, technologically sophisticated population (Scanlan, 2003).

Modernization is essential to food security in that it strongly predicts development. That is, "modern" societies are also the best fed, wealthiest, and most educated, industrialized, and politically stable (Scanlan, 2003). Economic growth should undoubtedly contribute to a country's ability to feed itself, and the ability of a country to achieve modernization will achieve food security.

Techno-ecologists like Berry and Cline (1979), Boserup (1965) and Simon (1998) take a more optimistic approach, arguing that ominous scenarios for the planet are oversimplified (Scanlan, 2003). They believe that technology and human ingenuity are the greatest resources available and are not being threatened with scarcity (Scanlan, 2003). Thus, as has been the case in the past, future challenges confronting the world's carrying capacity will be met. Techno-ecological perspectives are linked most closely with food availability and the importance of adapting agricultural methods to produce enough food (Scanlan, 2003). This was the whole philosophy behind the "Green Revolution" and the spread of new technology to LDCs where food is needed most. Fertilizer use and the intensification of agriculture, for example, are associated with human adaptation.

2. COMPLEXITIES OF FOOD INSECURITY

In July 2009, the G8 pledged \$20 billion for a new Food Security Initiative focused on boosting smallholder production in developing countries (Crash & Frayne, 2001). Since 2008, the World Bank has prioritized agriculture to actualize development through its "agriculture for development" strategy and emphasizes focusing on agricultural productivity to boost development and ensure zero hunger can be achieved. This is because of the complexity of the issues surrounding food insecurity such as:

1. Poverty:

Uvin (1994) notes that food security concerns food shortage, poverty, and deprivation. Food shortage concerns the supply of food available to the population within a geographic area (Scanlan, 2003). Thus, food poverty exists when persons in countries cannot "obtain sufficient food to meet the nutritional needs of their members due to inadequate income, poor access to productive resources, inability to benefit from private or public food transfers, or lack of other entitlements to food" (Scanlan, 2003)

In October 2009, three respected international organizations released their fourth annual Global Hunger Index, a grim set of data. After some progress in reducing the scourge in the 1980s and first half of the 1990s, the report noted that hunger was back on the rise (Powledge, 2010). Twenty-nine countries have "levels of hunger that are alarming or extremely alarming: South Asia and Sub-Saharan Africa having been hit the most (Powledge, 2010).

The extent and distribution of poverty in rural Africa in general and in East Africa is often responsible for driving unsatisfactory food security, health and welfare outcomes for tens of millions of smallholder farmers and their families. The role that poverty plays in food insecurity has been described as detrimental. The nature of the relationship between poverty and food security is interdependent, and in many aspects can be seen as a 'poverty trap' - a cycle of low levels of productivity that cause poverty and lead to food insecurity and poor development, thus making it difficult to escape.

2. Reliance on Rain-fed Agriculture:

Food insecurity and persistent droughts in Kenya have almost become a norm due to over reliance on rain-fed agriculture. Every three to five years, the country goes through the same cycle of long dry spells, acute food shortages, soaring commodity prices that usually leaves millions of people at the mercy of emergency food assistance. In addition to adverse weather conditions farmers also suffer the consequences of crop diseases and pests.

3. Pests, Diseases and Drought Resistant Crops:

Maize is a cash crop in most countries and a shortage in maize leads to an alarm in food security. Maize Lethal Necrosis Disease (MLND) is a common disease among maize farmers leading to farmers recording massive losses in productivity. Additionally, overreliance on crops such as maize and beans by many farmers has led to many losses in the times when the rains were not sufficient, and where growing of drought resistant crops would have brought in better harvests, smallholder farmers only do mono-cropping. However, the problem is bigger than just severe droughts and unfavorable weather patterns.

4. Poor Infrastructure:

Poor infrastructure is a major impediment in ensuring agricultural produce gets to the markets in time. Roads in the rural areas are poorly constructed and managed and the markets are in far flung urban towns that take almost seven-eight hours of road trips in getting the fresh produce from the farms to the actual points of sale (GoK, 2015). Poor key physical infrastructure and lack of access to vehicles or carriers has caused small holder farmers losses in millions daily as their fresh produce is perishable and spoils even before it gets to the markets.

3. RURAL SMALL HOLDER FARMING

About two-thirds of the developing world's three billion rural people live in about four hundred and seventy-five million small farm households, working on land plots smaller than two hectares (Rapsomanikis, 2015). Many are poor, food insecure and have limited access to markets and services. Their choices are constrained, but they farm their land and produce food for a substantial proportion of the world's population. Besides farming, they have multiple economic activities, often in the informal economy, to contribute towards their small incomes.

In Sub-Saharan Africa, achieving food security has become a multi-dimensional challenge. International institutions have pushed for Africa to embrace the 'green revolution' strategy to increase the production of food for subsistence and sale amongst small farmers. Smallholder farmers in Sub-Saharan Africa often lack access to quality seed and fertilizer. Many policymakers assume that if farmers had access to inputs from a local agro-dealer, they would be able to successfully increase their yields. In reality, access alone is not enough. Access to inputs without training can be detrimental. For example, if a farmer misapplies fertilizer, the yield can remain stagnant or even decrease. As a result, the increased expenditure on fertilizer can actually result in decreased profitability (Lowder, 2011). Small holder farmers can only adopt new technologies like seed and fertilizer successfully if they receive clear, tangible instruction on how to use those new technologies correctly.

Maize which dominates the diets in Sub Saharan Africa makes up for more than half of a smallholder household production. Together with maize, smallholders cultivate sorghum, millet, cassava, potatoes, as well as also beans and vegetables. This maize-mix farming system is the most important food production system in East and Southern Africa, extending across plateaus and highland areas from Kenya and the United Republic of Tanzania to Zambia, Malawi, Zimbabwe, South Africa, Swaziland and Lesotho (Rapsomanikis, 2015). With bimodal rainfall patterns, farmers have two cropping seasons, but in drier areas they usually harvest only once a year. In addition to crops, cattle provide ploughing, breeding, milk and farm manure.

Smallholder farms still lead agricultural production in developing countries, and are a key piece in any policy design aiming to improve food security and reduce the poverty gap. Despite their importance in agricultural development, small farms may not be able to contribute to growth. In Kenya it is not any different. The challenges facing small-holder farmers include:

a. Economic Challenges:

The Agricultural Sector has in pursuit of reducing food insecurity received a lot of support from the government and donors to promote national development which is key in achieving sustainable Goal 2 on Zero hunger. However, rural households are still the most vulnerable due to climate change and economic challenges. This is because for the poor, vulnerability is both a condition and a determinant of poverty and is related to their inability to avoid, cope with, or recover from the harmful impacts of factors beyond their control that affect their lives. Agricultural practices must therefore utilize land-use strategies that maintain soil fertility and natural resources while producing output adequate for markets and consumption. Kenya needs to actualize its agricultural sector productivity and boost its output to achieve SDG 2 and ensure it becomes food secure.

b. Technological Advancements:

Kenya boasts being one of the most technologically and digitally advanced countries in the East African region, but its agricultural produce is still more human based than it is mechanized. Modern science and use of appropriate technology in boosting agricultural productivity remains a major challenge and small holder farmers pay the biggest price. Inadequate research and use of outdated farming techniques have led to significant declines in agricultural productivity of small holder farmers across the country; they still use ox and plough technique which takes up more time than if one used a tractor with an attached harrow. In parts of Eastern rural Kenya, small holder farmers still manually harvest lands, and take three weeks on seed implantation.

c. Pests and Diseases:

Many of the rural smallholder farmers have little access to information and resources in curbing the pest menace with the changing climatic conditions. They are poorly informed and have little or no money to afford pesticides that can help them control loss of agricultural produce to pests. Additionally, post-harvest losses are on the rise because of poor handling and poor or a lack of storage facilities that are pertinent in ensuring hygienic and fresh products are delivered to gain maximum profits. For example, the aflatoxin pest menace that ravaged Eastern and parts of rural Coast in Kenya where small holder farmers had no solution.

d. Declining Agricultural Production:

Agriculture productivity is on the decline among the smallholder farmers, which has intensified food insecurity in the country and perpetuated reliance on food supplies from donor agencies like the World Food Programme (WFP) and Food and Agriculture Organization. Food security is a global phenomenon; dependency and world systems theories believe that one must consider international factors affecting hunger. In this regard, dependency and world system theories address the links between individual countries and the world food order (Scanlan, 2003).

Small-holder farmers also experience other obstacles including low yields, very limited land availability and limited access to inputs and services. A changing social and economic environment is, however, bringing new opportunities: population growth is widespread; urbanization is occurring at a rapid rate; economic growth is strong in the region; and modern food retailing requiring more-sophisticated production, distribution and marketing is emerging.

4. EFFECTS OF FOOD INSECURITY ON SMALL HOLDER FARMERS

Small holder farmers farm in diverse climatic systems, especially those in the developing countries. These changing climatic patterns alongside their assets and labour skills encompass and shape their economic livelihoods. Access to well-functioning markets also plays a key role in determining the economic welfare of smallholder farmers; difference in endowments creates a huge disparity in the integration and contribution to the economy.

Smallholders across the developing world share characteristics and similar plights of their sufferings and these are seen most across those that are involved in multiple activities in trying to make ends meet (Keatinge, 2010). A lack of support and access to poor facilities is causing these farmers to look for other economic activities to partake and support their families economically, however, lack of employable skills and a general lack of confidence in themselves to do something that is not in their comfort zones is pushing many families into extreme poverty. As a result, there is a growing decline in agricultural production and a significant rise in food insecurity in many developing countries.

Additionally, small holder farmers do intensive farming and they diversify their production according to their diet requirements, and use majority of the output for domestic consumption as they do not have adequate and access to well-functioning markets that they can sell their produce at. They use more fertilizer and seed per hectare than other farmers and rely heavily on family labour. In fact, family labour makes a difference in Kenya; small farms are more productive than larger farms on a per hectare basis. But their productivity lags behind that of farmers in the developed world (Keatinge, 2010). It is the lack of well-paid employment opportunities in the rural areas in conjunction with the need to produce food for their families that makes smallholders work on their farms more intensively than profit maximization suggests. Again, more women are forced into manual labour to ensure that families have food on the table and this is reducing the overall capacity of women to contribute to the economy as their role is being seen in the domestic front.

Most smallholders are poor and by seeking wage- or self-employment in the rural non-farm sector, they try to both supplement and diversify their income sources to reduce risks. The jobs they choose are low skilled; smallholders have very low education levels. In many countries, what they bring home from working away from their farms is little, and often it is as much as what they gain from farming their land. But the high poverty incidence suggests that non-farm activities could reflect income diversification strategies to cope with risk, rather than well-paid nonfarm employment. The experience from the Green Revolution in Asia supports this line of reasoning (Lowder, 2011). Although Asian smallholders diversified their income sources, poverty in the region was reduced only by agricultural productivity increases brought about by encouraging farmers to adopt modern technologies.

5. SPURING AGRICULTURAL PRODUCTIVITY IN THE RURAL AREAS OF KENYA

Small holder farmers face numerous challenges making it necessary to involve them in sustainable development activities through public-private-partnership (PPP) development initiatives to address food insecurity. They need accurate information to make informed farming decisions; their immediate needs require technologies with diversified utilization options in ensuring that they can tackle situations as they arise. Consequently, development partners should provide adequate information on available technologies and innovations; exploit the existing PPP meetings to promote technologies and innovations with wide utilization options.

Currently, smallholders' supply 80 percent of East Africa's food production, but as few as 10 per cent of the smallholders are commercial producers. While the benefits of market participation may be significant, so are the costs and risks of market entry. A comprehensive agenda addressing smallholder market participation would be broad and embrace the wider policy environment. Rural-urban differences equate to gaps between the agricultural and industrial/manufacturing sectors of society, meaning that when policy favors economic investment for the city, it disfavors the rural agrarian lifestyle (Scanlan, 2003).

One such example of this occurs in Lipton's (1977) concept of "price twisting" in which state commodity boards benefit from purchasing agricultural products at artificially low cost from farmers and exporting it for profit (Scanlan, 2003). Another example would be policy that maintains food prices at a low level for urban markets to ensure access and limit potential unrest associated with scarcity or high costs (Scanlan, 2003). Such practices redistribute wealth from the poor rural areas to the cities. Those who produce food are the least able to afford it and are the most likely candidates for hunger from the poverty created by urban bias.

Providing the enabling environment to improve the investment climate and integrate smallholders into markets is a standard and passive policy prescription. Would this be enough to help smallholders meet the challenges of the future? Probably not. Therefore, food security among small-holder farmers could be addressed by a few considerations.

Effective and active participation of the Kenyan government could be the best solution for spurring agricultural productivity in the rural areas. The Kenyan government can amass other relevant decision-makers and together decide whether to adopt or further develop either the framework outlined in Vision 2030 or some variant adapted to particular circumstances. This would most likely involve extensive stakeholder consultation and a detailed cost-benefit assessment of a specific proposal, including the extent of proposed smallholder coverage, the number of farmer-groups and the related costs and benefits expected to be generated over time.

The Kenyan Government has stated the key role agriculture plays in reducing poverty and addressing food insecurity in the country and has worked on various blueprints centred around agriculture. Vision 2030 (2008-2030), is the long-term development blueprint for the country, Kenya's Strategy for eRevitalizing Agriculture (launched in 2004); Agricultural Sector Development Strategy (2010-2020); and Food and Nutrition Security Policy, 2011, among others all push for agriculture for development, but the country still remains food insecure and unable to meet the food needs of its population.

Particular agencies such as Kenya Agricultural Research Institute and the Ministry of Agriculture have comparative advantage in playing a public-sector agency role in implementation of such an initiative. Both have a network throughout Kenya and a charter that goes to the heart of addressing food security and poverty alleviation. However, smallholder communities and value-chain participants will understandably wish to drive the directions of a project from its inception, and so any public-sector involvement will need to be sensitive to potential ownership and empowerment-related concerns held by smallholders and other beneficiaries.

The Government of Kenya has already invested heavily through various local and international partnerships on food security and agriculture as it is the backbone of the economy. Even so, food insecurity is still a major challenge that must be addressed to achieve the Vision 2030 goals and Sustainable Development Goals by 2030. Most of these development plans place an emphasis on partnerships. More investment should be directed to institutions like Kenya Agriculture Research Institute, Kenya Agricultural Productivity Project, and Kenya Tea Development Agency to spearhead value addition process in agricultural sector. This will lead to partnerships between smallholders and agribusiness. The efforts of government should be very goal oriented and focus on:

- Improving access to markets as it would include a mix of promoting diversification towards high-value farming products (those demanded by the market), improving post-harvest handling, and developing rural infrastructure and storage capacity. It is important to highlight that market access relates to both outputs and inputs, including improved production technologies.
- Allowing smallholder farms to have a significant role in addressing food insecurity which requires easy access to input markets. There is evidence that, despite the growing adoption of improved seed by smallholders, there is still room for improvement. Improved recycling and storability make local seed more attractive than new varieties, showing the need to develop new seed adapted to real-world circumstances.
- Need for more exploitation on irrigation farming especially in Arid and Semi-Arid Lands (ASALs) to combat climate change. It is estimated that intensified irrigation can increase agricultural productivity fourfold and, depending on the crops, incomes can be multiplied ten times. All stakeholders should emphasize irrigation to reduce over-reliance on rain-fed agriculture in the face of limited high agricultural land. With irrigation, the farmers in the arable lands will still be able to have stability of agricultural output during adverse weather conditions. Further, irrigation should not just be for large scale schemes like rice and horticulture but should also be used by small-holder farmers and small-scale farming.
- The regional market as an important agent for the growth of agriculture in the region hence food security. Kenya should in general exploit the regional market potential and the government should encourage trade in agricultural produce across borders and provide quality control services.

- Investing in focused research on value-addition regarding issues of processing, storage and agricultural produce. This will give the smallholder farmers knowledge of how to process, store and pack their products for increasing access to markets; where they can sell their products. The research agenda should also be incorporated in the country's development agenda so that the government and its partners can invest more in the national agriculture research. In terms of policy regarding research, to fully implement the research agenda, international agriculture research centres should complement local research development and not the other way around. Kenya and other developing countries that depend on agriculture should thrive to finance its own agriculture research agenda and this would happen through increase of funds allocated to agriculture in Kenya's agriculture budget.

6. CONCLUSION

Smallholder agriculture dominates Kenya's agricultural landscape, accounting for 75 % of total agricultural output and 70% of the marketed agricultural produce. As a result, the Government of Kenya, with the support of development partners, has invested in production and dissemination of productivity-enhancing technologies such as high-yielding varieties and inorganic fertilizers targeting the smallholders. Adoption of these technologies has remarkably improved, especially in the maize subsector. However, productivity has been declining or, at best, stagnating. Productivity is attributable to not only technological improvements but also technical efficiency. The policy implication is that the country has room to improve agricultural productivity by addressing environmental and farm-level constraints. Viable options therefore must include making a deliberate switch from rain-fed to irrigated agriculture entrenching land tenure security, improving transport network among farming communities and setting up smallholder credit schemes.

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