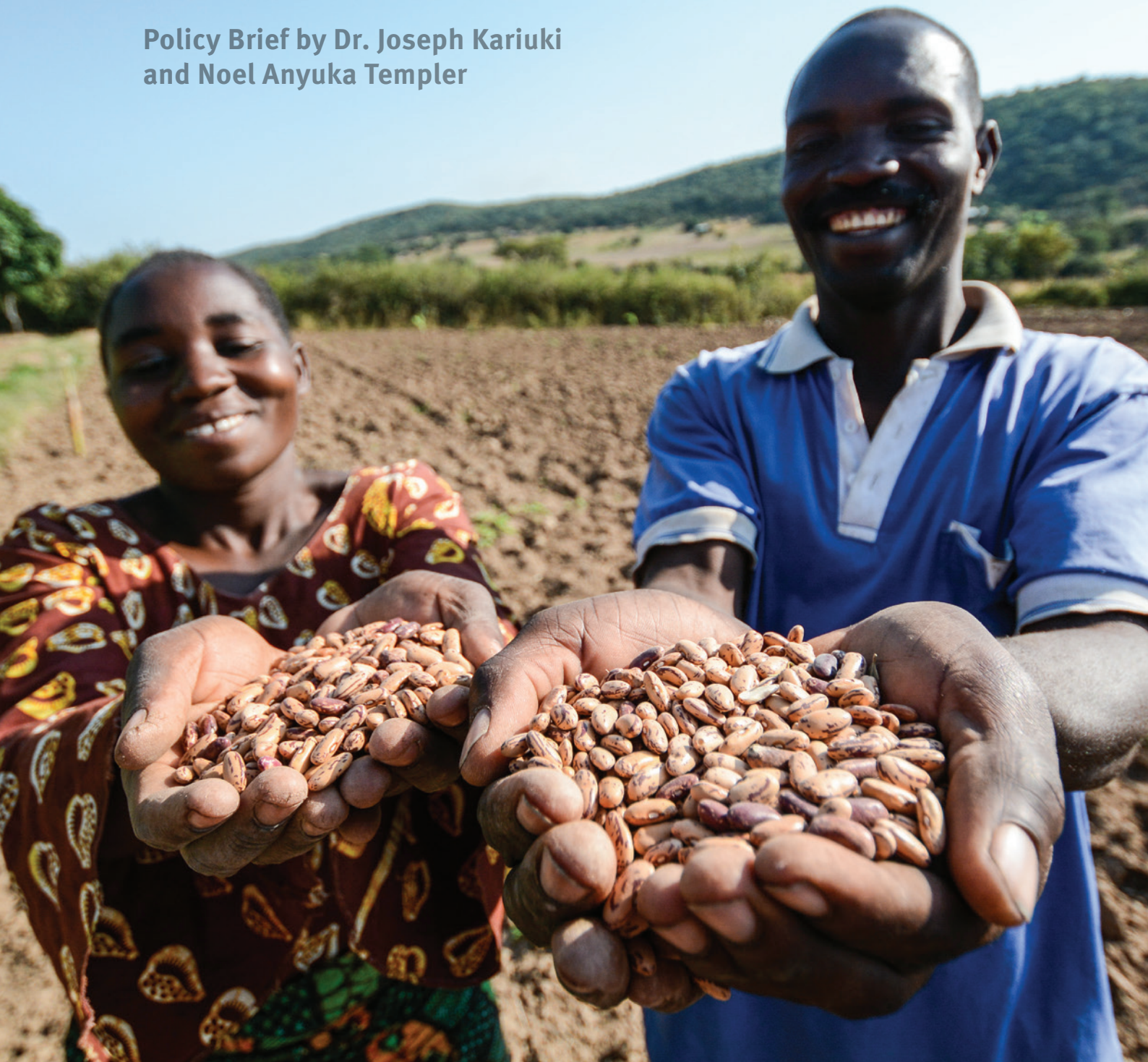


# Food Security & Crop Seed in Kenya

## Big Payoffs We Cannot Afford to Ignore

Policy Brief by Dr. Joseph Kariuki  
and Noel Anyuka Templer



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This policy brief is the second in a two-part series focusing on Kenya's crop seed sector. Part I considered the key forces shaping agriculture in Kenya and the relationship between crop seed and food security. Part II probes the economic costs of a poorly developed seed sector and offers recommendations for reforms.

This series of policy briefs is sponsored by Kenya Markets Trust in collaboration with its partner for work in the crop seed sector, Agri Experience, Ltd.

### About the Authors: Wisdom from the Past, Hope for the Future

Agriculture is a vital part of Kenya's past and essential to its future as well. So it is fitting that this report on the most important input for agriculture, seed, reflects the insights from two generations of African agriculture analysts.



**Joseph Kariuki, PhD,** is an economist with many decades of experience studying the effect of agriculture on rural development in East Africa, and watching with frustration as farmers struggle to

produce enough to feed their families. His work has given him a keen appreciation for why Kenya must act now to expand seed options for its farmers.

“The more I study the link between seeds and food security, the more aware I am of the high price we pay for failing to develop a robust seed sector,” he said. “When I was in my 20s, the population of Kenya was only about 13 million. And that seems like yesterday to me! I would not have believed someone if he or she told me Kenya would grow so much, yet deteriorate in terms of food security. And it's not just about food security, it is about good nutrition so children's brains can develop, it is about families who forgo medicine and education because they have to spend so much of their income on food. We need a productive debate about the many technical challenges in our seed sector. But let's keep foremost in mind that this is about the lives we want for our children and grandchildren, and the future we want for our country.”



**Noel Anyuka Templer, MSc,** is just beginning his career as an agriculture policy analyst. But his work is rooted in strong family ties to farming and a belief that a stronger seed sector could help drive broader changes that would

prompt more young people to pursue opportunities in agriculture.

“My generation is very aware of the enormous technological advances that are occurring in agriculture,” he said. “But many well-educated people my age look at farmers struggling across Kenya and their first thought is: ‘there's no future here for me.’ It should not be that way. I know from my work that agriculture in Kenya could be every bit as exciting and profitable as working at a tech company or an investment firm. But I also know that if we fail to develop a vibrant seed sector, agriculture in Kenya will stagnate and people in my generation will be right to take their talents elsewhere.”

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# 1. Introduction: Seeds and Civilizations

Deep in a mountain on a remote island near the Arctic Circle lies a treasure some would argue is more valuable than anything on earth. It's not gold or diamonds. It's seeds. They are stored in the Svalbard Global Seed Vault, the world's largest collection of crop diversity. The vault is a testament to the fact that of all the things a human civilization requires for survival, seeds are arguably the most important.

Most Kenyans intuitively understand this fact, because most Kenyans are farmers. A large majority of Kenyans depend on agriculture for food and income. In fact, the first deposit of seeds at the vault was made in 2008 by the late Kenyan Nobel laureate Wangari Maathai. It was a box of rice seeds containing varieties from 104 countries.

This analysis, *Food Security and Crop Seed in Kenya: Big Payoffs We Cannot Afford to Ignore*, is the second in a two-part report on Kenya's seed sector. The first part, *Food Security and Crop Seed in Kenya: Challenging Trends We Cannot Afford to Ignore*, identified key forces shaping agriculture in Kenya and impeding progress against food insecurity and poverty. That report considered how the seed sector fits into Kenya's growing demand for food—along with its rising food import bill, stagnant crop yields and lack of improved varieties for crops other than maize.

This report, *Big Payoffs*, builds on Part I with additional insights that offer both perspective and hope. It provides a frank assessment of why the

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*Despite the importance of seeds for Kenya, this is not a subject that attracts significant public attention.*

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Yet despite the importance of seeds for Kenya, this is not a subject that attracts significant public attention. It should, because our seed sector is not meeting our farmers' or our country's needs. A lack of quality seeds, across a wide array of crops, contributes to our low yields. As a result, food production is not keeping pace with population growth. In fact, most farmers in Kenya cannot even produce enough food to feed their families. They rely on markets to make up the difference, and these markets depend on costly imports to fill their food bins.

seed sector in Kenya is not providing farmers with the choices that farmers in many other countries take for granted, and how this weakness hurts the broader economy—something known as an “opportunity cost.” But it also offers hope by considering how influential actors in the public and private sector are coming to grips with the problem and working together to seek reforms. It concludes with a series of high-level recommendations on how to lay the groundwork for a vibrant seed sector—one that could anchor a broader economic transformation across Kenya.

## 2. How Did We Get Here?

Whether it's transportation, energy, education or agriculture, the successful development of any economic sector does not happen by accident. It involves a carefully planned journey.

Kenya is at a point in its development journey where its crop seed sector could become one of

its great economic successes. But realizing its potential will require reflection. How did Kenya's seed sector arrive at its current state, characterized by competence in maize, but many weaknesses in other crops? The answer to this question can reveal a productive path forward.

### 2.1 Africa, Asia and the Economics of Agriculture

All over the world, there is an economic version of needing to crawl before you can walk. It has to do with the fact that most countries must first establish a strong and productive agricultural sector before industrialization can succeed. The capacity to consistently and efficiently produce and process an abundance of agriculture commodities generates income and raw materials. Eventually, it also frees up labour and capital that can help drive the development of a manufacturing base.

In Kenya, for many decades following its 1963 independence from British rule, the government's agriculture interests revolved around producing and exporting "cash crops," such as coffee, tea, cotton, and, later, horticulture. Farmers growing these crops enjoyed consistent government funding for research, extension, processing and marketing. An elaborate system of government-affiliated "parastatal" bodies was established to manage cash crop production and marketing. Food crops, meanwhile, were of secondary importance. Kenya had a relatively small urban population at the time and the rural population was considered self-sufficient in producing food.

But food crops are now a central concern for Kenya. A rapid population rise—especially in urban areas—has greatly increased demand for food in Kenya, where each year there are at least one million more mouths to feed. Meanwhile, economic liberalization

in the late 1990s reduced support for cash crops. As a result, rural incomes declined. Between 1980 and 2012, growth in Kenya's agricultural sector also fell, eventually averaging a mere 3.4 percent growth between 1995 and 2003, and dropping further to an average of 2.4 percent between 2003 and 2012.<sup>1</sup>

Policymakers have been slow to recognize and respond to these shifting dynamics, leaving one to wonder what might have happened if food needs had sparked a more aggressive response. One answer is to look at what happened in Southeast Asia.

A recent study compared development outcomes in four Southeast Asian countries with those of four sub-Saharan African countries over the second half of the 20<sup>th</sup> century.<sup>2</sup> Kenya was compared with Malaysia, Tanzania with Vietnam, Uganda with Cambodia, and Nigeria with Indonesia. The Asian countries beat the African countries without exception. The study concluded that the agriculture policies pursued by Asian political leaders made all the difference. They pushed through significant state-led investments in all areas of the agriculture sector: research, input supply, credit support, marketing support and other services.

These efforts gave farmers both the means and the motivation to increase production and spurred the development of a competitive private sector market for agricultural inputs. The overall outcome was a rapid and sustained increase in agricultural

production and employment, which subsequently produced dramatic reductions in rural poverty. Then, as economic theory would predict, industrialization followed.

In Africa, however, during this same period, governments tried to emphasize industrialization. But they did so without first creating a strong productive and profitable agriculture sector. This failure was in part due to a mindset in which food challenges were seen as a problem for donors to deal with, rather than a domestic policy priority. Predictably, the industrialization effort floundered.

The divergent experiences in Asia and Africa provide powerful evidence for the link between agriculture policy and poverty reduction. As the UN Food and Agriculture Organization (FAO) has noted, effective agriculture policy has the potential to substantially reduce hunger, even among very poor populations, while generating jobs and income.<sup>3</sup> The corollary to this statement is that when these policies are absent, food

production stagnates, as do rural economies and ultimately the pace of industrialization.

In Kenya, the crop seed sector exemplifies these shortcomings. While it started with essentially a single company in the 1950s, in recent years it has become somewhat more inclusive, as there are now approximately 20 active private sector companies producing and selling crop seed. However, it is neither a vibrant and growing sector, nor one that operates in an enabling environment. It continues to suffer from anaemic public investments in agricultural research and lacks strong systems for providing farm inputs, credit and market support to rural farmers.

Most notably, the market is largely dominated by ten government-affiliated “parastatal” seed companies that often have free or low-cost access to significant assets, including crop breeding capacity, land, buildings and equipment. In fact, just two of these companies account for the majority of sales for almost all crops in the crop seed sector.

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## 2.2 Kenya Agriculture Policy: Strong Support in Theory, but Not in Practice

Kenya has embraced the African Union’s Comprehensive Africa Agriculture Development Programme (CAADP), which calls on countries to devote at least 10 percent of their budgets to agriculture. Kenya met this threshold during the 1980s. But since then, agriculture’s percentage of the national budget has declined drastically, and in the 2016/17 budget stands at 4.3 percent.<sup>4</sup>

This drop has been especially hard on Kenya’s key seed-related agricultural research institutions. The need for revenue has prompted them to sell seeds in the commercial market, often at the expense of

the commercial firms they are supposed to serve, charge relatively high royalties for low margin crops, and levy additional testing and regulatory fees. They also spend a large amount of time courting donor funds, rather than focusing on their core mission.

All of these activities have taken a toll on Kenya’s crop seed sector and, by extension, Kenya’s capacity to produce food. As we noted in the *Challenging Trends* report, weakness in the seed sector is one reason an estimated 43 percent of Kenya’s population is food insecure.

### 3. What's the Cost of Staying Here?

Let's start with the blunt answer: *the cost of keeping on the current course with Kenya's crop seed sector is incredibly high.*

Consider the basic facts: a very large percentage of Kenya's population works as smallholder farmers. Domestic unemployment is high, mainly because job opportunities for Kenya's steadily growing youth population are limited. Also, Kenya's foreign exchange rates have declined, which makes imported goods more expensive. Clearly a stronger crop seed sector that could drive an increase in domestic food production could offer tremendous economic advantages in multiple ways.

Higher production could lower food costs; improve exchange rates by reducing food imports; generate

jobs in food processing and other agriculture-related businesses; increase tax revenues; and boost incomes in poor, rural households.

Due in part to its slow growing (even shrinking), costly, and only moderately competitive crop seed sector, Kenya is missing out on all of these benefits. Instead it is paying what economists call an "opportunity cost." For Kenya, this cost is the high price tag associated with maintaining the status quo in the crop seed sector and failing to capture the many benefits that could come with the right kinds of reforms. We can begin to understand the magnitude of what Kenya is giving up by looking at individual components of the seed sector's opportunity costs.

#### 3.1 Lack of High Yielding Seed Drives Wasteful Land Usage

Better seeds could dramatically boost food production on Kenyan farms without expanding cropping areas. For most of Kenya's key food crops, quality seeds of improved modern varieties almost always produce a higher yield—by 50 percent at least, but often much more—than seed recycled from the previous year's crop. The adoption rate for certified seed is highest for maize, accounting for about 70 percent of Kenya's maize crop. For others, like beans and millet, the adoption rate ranges dismally between 10-20 percent, and often below 5 percent. If the area planted with certified seed increased by just 10 percent for maize and around 30-40 percent for other crops, overall production would surge, providing an immediate boost to food security (see Tables 1 and 2).

This increase also would energize the economy because it would be worth at least Ksh 23 billion (about 230 million US dollars). Of critical importance, Kenya would be positioning itself to generate commodities to supply new agriculture processing businesses, which would generate jobs. This is exactly the path followed by the Asian countries referenced earlier. It all starts with the political will to lay a foundation for a strong agriculture economy, and the first bricks in that foundation are seeds.

**TABLE 1: Land planted with certified seed (current and future)**

| Crop           | % of cropped land planted with certified seed (current)<br>(1) | Area planted with certified seed (ha) (current)<br>(2) | % of cropped land planted with certified seed (future feasible)<br>(3) | Area planted with certified seed (ha) (future)<br>(4) | Additional area planted with certified seed (ha) (4-2) |
|----------------|----------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------|
| Maize          | 70                                                             | 1,481,299                                              | 80                                                                     | 1,692,913                                             | 211,614                                                |
| Beans, dry     | 10                                                             | 105,241                                                | 50                                                                     | 526,204                                               | 420,963                                                |
| Sorghum        | 20                                                             | 42,704                                                 | 50                                                                     | 106,760                                               | 64,056                                                 |
| Millet         | 20                                                             | 27,766                                                 | 50                                                                     | 69,415                                                | 41,649                                                 |
| Sweet potatoes | 10                                                             | 6,107                                                  | 50                                                                     | 30,534                                                | 24,427                                                 |
| Cassava        | 10                                                             | 6,373                                                  | 50                                                                     | 31,863                                                | 25,490                                                 |

Source: FAOSTAT (area, yield and production figures for 2014, see note on authors' assumptions below)

**TABLE 2: Value added from using certified seed** (See note on authors' assumptions below)

| Crop                                              | Current yield (kg/ha) | Future yield (kg/ha) | Yield increase (kg/ha) | Additional area planted with certified seed (ha) | Price per Mt (Ksh) | Value of additional production (Ksh) |
|---------------------------------------------------|-----------------------|----------------------|------------------------|--------------------------------------------------|--------------------|--------------------------------------|
| Maize                                             | 1,672                 | 2,508                | 836                    | 211,614                                          | 29,000             | 5,130,369,816                        |
| Beans, dry                                        | 514                   | 771                  | 257                    | 420,963                                          | 63,000             | 6,815,811,933                        |
| Sorghum                                           | 630                   | 945                  | 315                    | 64,056                                           | 40,000             | 807,105,600                          |
| Millet                                            | 660                   | 990                  | 330                    | 41,649                                           | 53,000             | 728,441,010                          |
| Sweet potatoes                                    | 18,088                | 27,132               | 9,044                  | 24,427                                           | 33,000             | 7,290,287,004                        |
| Cassava                                           | 11,231                | 16,847               | 5,616                  | 25,490                                           | 21,000             | 3,006,188,640                        |
| <b>Total value of additional production (Ksh)</b> |                       |                      |                        |                                                  |                    | <b>23,778,204,003</b>                |

Source: FAOSTAT (current yield and price per MT), additional area planted calculated in Table 1, [www.sokoplus.sokopepe.co.ke/market\\_prices/index/](http://www.sokoplus.sokopepe.co.ke/market_prices/index/) (price per MT)

Authors' assumptions: Increase in the percentage of land planted with certified seed brings maize to 80 percent and other major crops to 50 percent; average yield increase of 50 percent.

## 3.2 For Farmers, Food Needs Devour Income

Today, about 70 percent of Kenyans live in rural areas, where a typical household allocates about half of its monthly budget to purchase food.<sup>5</sup> Such a large family budget allocation often means there is not enough money for other priorities, like medical care, children's schooling and important items for the home.

A big part of the problem is that while most rural families farm, very few produce enough to feed their families. In some areas, 80 percent of what families consume comes from local food markets.<sup>6</sup> Clearly, we need to expand the options available to rural farmers so at least they can produce enough food to feed their families and, ultimately, move beyond subsistence farming to engage in farming as a business.

## 3.3 Exchange Rate Pays the Price for Food Imports

The rising price of food imports is another cost linked to Kenya's failure to enact reforms. If imports continue along their current trajectory, by 2030, Kenya may be spending close to USD 4 billion US dollars for imports of maize, rice, wheat and other food. Furthermore, climate change shocks could negatively affect production and create an even greater reliance on agricultural imports, which already account for close to 10 percent of Kenya's total imports.<sup>7</sup>

A growing food import bill hurts the entire economy by depressing the value of the Kenya shilling. Then virtually all imported goods and services become more expensive, across all sectors of the economy.

Over the last six years, Kenya's exchange rates have deteriorated by 25 percent, moving from a fairly stable Ksh 80 per US dollar to the apparent new norm of Ksh 100 per US dollar. Additional large devaluations are very likely to occur if Kenya fails to address fundamental flaws in its agricultural sector, starting with its significant, but eminently solvable, seed issues.

## 3.4 Producing Food, Harvesting Jobs

A recent analysis by researchers at Michigan State University projects that between 2010 and 2025, 17 percent of all new jobs created in the African economy could be food-related jobs *off the farm*, in areas such as retailing, processing and food preparation.<sup>8</sup>

Kenyan officials should take note, because Kenya struggles to put its human capital to productive use, particularly its youth. Today there are more young people entering the workforce in Kenya than ever before. As a result, the overall percentage of Kenyans that are considered of working age has swelled from 47 percent in 1990 to 56 percent in

2014.<sup>9</sup> But Kenya has not been able to absorb this influx of workers. Its current youth unemployment rate is about 17 percent, the highest in East Africa.<sup>10</sup>

Looking at Nigeria's experience offers evidence of how agriculture investments can improve the employment picture.

Shortly after 2000, Nigeria increased its public investment in agriculture, particularly in rural areas, as it sought to stem the tide of rural people moving to cities in search of jobs. The payoff came between 2010 and 2013, when the percentage of total employment generated by agriculture rose rapidly.

The rise in farming jobs in Nigeria is associated with the significant decline in unemployment among the working age, particularly in rural areas.<sup>11</sup>

Essentially, when agricultural productivity grows, it can kick off an economic chain reaction that

generates jobs throughout the economy, starting with jobs in new agriculture and food-related processing businesses. But for that first domino to fall, domestic producers have to become reliable sources of raw commodities.

### 3.5 Seeding Kenya's Export Advantages

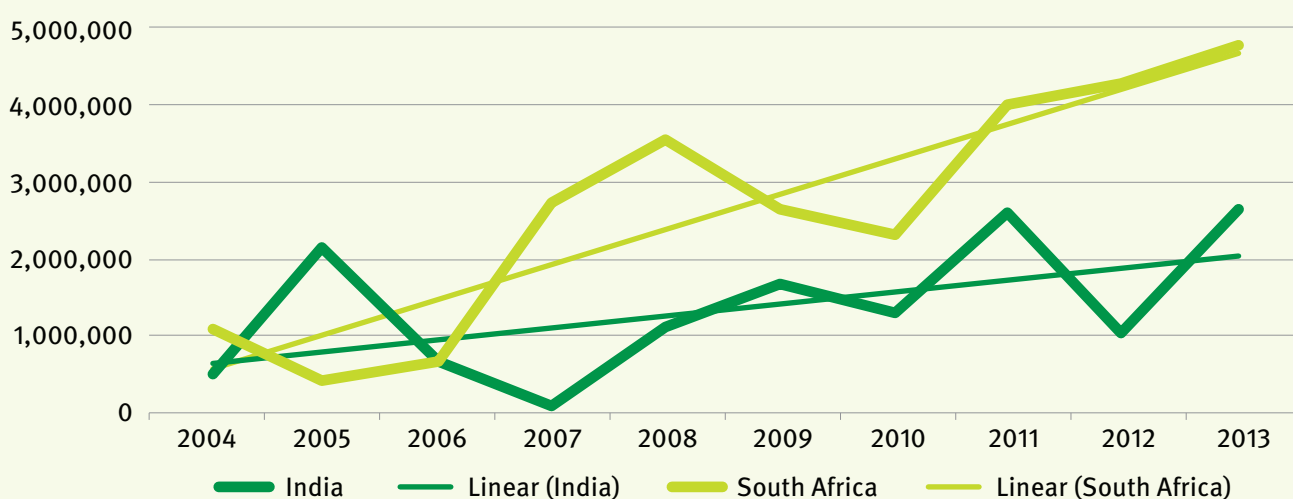
Kenya is situated in a strategically advantageous position within a regional market for food and seed that is large and growing. It stands out among the six countries of the East African community with its seaport, functional road network and relatively favourable climate. In addition, climate change is predicted to impact some of Kenya's neighbours more severely than Kenya, thus favouring food and seed production in Kenya.

Kenya is one of 19 countries in the Common Market for Eastern and Southern Africa (COMESA) economic block. COMESA is in the final stages of harmonizing seed regulations across its member countries, which will make it easier to export seeds. Regional seed markets can be important drivers of foreign exchange. In both India and South Africa,

after the liberalization of the seed sector, maize export volumes grew to significant levels, as shown in Figure 1, below.

There is no reason why Kenya cannot become a significant source of seed exports—particularly for high value-added seed—just as it has for fresh flowers and produce. Seed exports can contribute significantly to a nation's foreign exchange earnings, as they do for countries like Zambia and South Africa. Neighbouring countries are already moving to capitalize on this opportunity. For example, in Uganda, the private sector is strengthening its export capability by setting up a third party seed certification entity affiliated with an International Seed Testing Association (ISTA)-accredited lab.

**FIGURE 1: Growth in maize exports, 2004-2013, India and South Africa, in metric tons**



Source: FAOSTAT

### 3.6 Beefing up Livestock and Dairy

Livestock and dairy production are important components of the agricultural sector in Kenya, contributing 12 percent to the nation's GDP and 40 percent to the agricultural GDP.<sup>12</sup> But demand for meat and milk is growing rapidly and Kenyan suppliers are not keeping pace. They must either significantly improve productivity or imports, which already account for 20-25 percent of Kenya's total red meat supply, will continue to rise.

As competition for land intensifies, maintaining and increasing production will increasingly require Kenyan livestock keepers to cultivate pasture, forage and fodder crops. But seed demand in Kenya

for these crops exceeds supply—and not by two or three times the supply, but possibly by as much as one hundred times, or even more.

For a glimpse of what this deficiency is costing Kenya, look at the livestock business in Somalia, where Kenyan cattle often go for fattening before being exported to the Middle East. In 2014, FAO reported that Somalia exported over 5 million animals worth an estimated \$360 million US dollars, the largest on-the-hoof movement in the world. Consistent with the agricultural production spillover effects noted earlier, animal bones are now driving a growing soap industry in Somalia.



## 4. How Can We Change This?

Clearly, we are an agricultural nation and there are indications we are ready to embrace food production as a source of strength, as opposed to a burden only donors can lift. But if we want to tap the full potential of Kenya's agriculture sector to deliver benefits across society, we simply must have a vibrant, innovative, competitive and highly efficient crop seed sector. Here are a few ways to reach this goal.

### 4.1 Let Industry Drive the Seed Sector, but Responsibly

For a long time, the seed industry in Kenya has been driven by government and donors. In the early years after independence, parastatal presence may have been necessary. But now this dependence has become increasingly costly, most notably for farmers.

For example, the dominant position of government-affiliated parastatal seed companies, which control an estimated 75 percent of the market, damages the overall health of the sector. It discourages investment by the private sector and stifles innovation. It also increasingly prevents private sector companies from achieving large-scale operating efficiencies. These benefits are reserved for government producers, even though studies indicate that governments are generally less efficient than the private sector in manufacturing and distribution.

The majority of crop varieties produced by government plant breeders are licensed to or are being commercialized by parastatals—but aside from hybrid maize, most are produced at extremely low levels. Arguments that private sector companies are not willing to step in are questionable. Many other countries are successfully increasing adoption of improved, high-yield

**The total cost of not aggressively pursuing an enabling environment in Kenya's crop seed sector is significant. Think about what we are giving up:**



higher yields on virtually all crops



disposable income for millions of rural farm families



improvements in nutrition, health care and education (which come from reducing expenditures on food to ward off hunger)



lower food imports, which improves foreign exchange rates



employment for Kenya's growing youth population



raw materials to drive the development of local processing businesses



increased livestock and dairy productivity, and value-added livestock export income



lucrative food and seed exports to neighbouring countries

crop varieties (other than just hybrid maize) and improving food security without government's commercial presence in the seed sector. We need to learn from these countries.

Donor prominence, too, must be questioned. It often leads to situations where both public and private sector players respond to donors' project priorities rather than to the wants and needs of Kenya's farmers. Donors can play important roles in helping Kenya move to a sustainable, market-based,

farmer-focused system. But they should not crowd out responsible public and private sector behaviour.

Market forces are clearly expanding choices in Kenya in many areas, including telephones, hotels, food, horticulture and building materials. And there is oversight in place for these sectors, including self-regulation, to ensure responsible behaviour. Kenya's crop seed sector should be no different. And competition in the seed sector provides an additional benefit: overall food production increases.

## 4.2 Fund KALRO to Focus on Breeding, Research and Licensing

The mandate for the Kenya Agricultural and Livestock Research Organization (KALRO), as defined in the Kenya Agricultural and Livestock Research Act 2013, is to promote, streamline, coordinate and regulate all aspects of research in agriculture and livestock development. However, currently KALRO also produces and markets certified seed to donor projects, farmers and NGOs, which is well beyond its research mandate.

It is true that for some crops, KALRO is arguably the only commercial supplier available. But that's mainly because there has not been a focused effort to develop an enabling environment and alternative

suppliers in the private sector. There is also the fact that private sector companies often do not have access to the early generation seed from KALRO that they need to scale-up production.

KALRO needs a clear mandate and sufficient levels of funding to carry out its core responsibilities: research, breeding and licensing. Seed industry stakeholders need to agree on how KALRO can finance and achieve its mission. Large-scale crop seed multiplication and distribution should be left to seed companies, and we need to ensure there is an enabling environment so that they can do this important work.

## 4.3 Expand Seed Choices and Farmer Protection

### Moving Beyond "Recycled" Seed

In a competitive market for seeds, farmers have choices. If farmers prefer to buy fresh seed every season, that should be their choice to make.

But all too often, under Kenya's current system, farmers recycle seed from the previous year's crop because they feel they have no other choice. And often they are right. A recent survey by the market

research firm IPSOS showed that 89 percent of Kenya's farmers plant at least some recycled seed, with 32 percent planting ONLY recycled seed. This must change, because recycled seed cannot provide the yields farmers need and power the kind of agriculture sector Kenya deserves.

Also, if we want farmers to appreciate and embrace advances in research and technology, they need access to information, coupled with an affordable

way to try out new approaches. County extension systems, if strengthened, are one way to address this shortcoming. Farmer and agrodealer education tools can provide solutions as well, like the MbeguChoice.com website that helps farmers evaluate seed options, or the MbeguChoice app for smartphones.

Kenya also should be flexible with its seed regulations. For example, vegetatively propagated seed material, which is key for root and tuber crops, has been in short supply in Kenya, in part because it's expensive to transport. Local production could be the answer. So allowing KEPHIS-supported county level oversight for these crops instead of forcing adherence to national seed certification might be a better way to go.

Overall, there is a need to understand options available for different types of crops and to then choose the approach that gives farmers the widest selection of high-quality products.

### **Sanction Companies that Break Rules, Including Agrodealers**

Seed is one of the most important investments a small-scale farmer can make. Conversely, counterfeit or low-quality seeds can be one of the most disastrous purchases a small-scale farmer can make, as it can steal an entire season from the farmer.



But the integrity and quality of seeds are invisible to farmers at purchasing time, which is why seed producers and merchants must be governed by a clear, enforceable code of ethics. At present, there are market participants—some criminal, and some merely negligent—who flout rules, ethics and good practices. These problems can be solved by cracking down on seed sellers, including agrodealers, who deliberately traffic in poor quality products.

This important quality control work requires a combination of legal enforcement from government officials and financial penalties from an industry regulatory body. A significant increase in self-regulation is a key element of the solution, for both seed companies and agrodealers, because it is impossible for government to monitor every bag of seed. County officials can also play a role in ensuring the integrity of inputs sold in their jurisdictions.

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*The integrity and quality of seeds are invisible to farmers at purchasing time, which is why seed producers and merchants must be governed by a clear, enforceable code of ethics.*

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## 4.4 Leverage This Equation: Youth + Technology = Smarter Farmers

The youth of today excel at adopting information technologies. We are already seeing a great deal of evidence that educated, connected young farmers utilizing modern information and communications technologies—smart phones, internet sources, online groups and SMS capabilities—are changing the game and making good profits.

In Kenya, increased use of agriculture-related information technologies by farmers may signal a shifting trend towards “smart farming,” particularly for small and medium-sized enterprises. We need to recognize and build on this trend. It can help make agriculture attractive to middle-income earners looking for an opportunity to earn extra money and infuse Kenyan agriculture with young talent, while

at the same time providing urgently needed job opportunities.

Interactive information tools can give farmers insights into seed selection, input usage, crop management, market dynamics, and prices, without ever requiring them to leave the field. In the seed sector, these kinds of services are most likely to emerge from competitive, private sector companies seeking to add value to their products and attract new customers.

With its large population of Internet-savvy youth and high percentage of smart phone ownership, there is probably no country in Africa in a better position to apply information technology to agriculture than Kenya.

## 4.5 Regulations Should Support, Not Stifle, Seed Sector Growth

For a business to succeed, innovate and respond to customers, it must be profitable and efficient. However, good regulatory oversight is also essential. The key question is how to achieve the proper balance.

Both the public and private sectors recognize the challenge, and are currently working together to develop new, more supportive approaches. For example, the Kenya Plant Health Inspectorate Service (KEPHIS) will soon authorize its first class of non-KEPHIS inspectors to carry out seed inspection and sampling. This is a very admirable beginning, as the high cost and crowded schedules of inspectors has been a key challenge for private sector seed production efficiency.

In addition, the introduction of new crop varieties must become more efficient and market-driven. We must ask ourselves: what is the goal of requiring lengthy National Performance Trials (NPTs) in Kenya, and do the NPTs achieve the stated goal? Many of the most successful seed sectors in the world (South Africa, India and the United States) do not take this approach. Instead, they employ a highly market-driven registration approach, which lists and defines varieties proposed for sale by seed companies, and let farmers decide what they value for purchase.

Regulation can be obstructive or enabling. What Kenya's seed sector urgently needs is an enabling regulatory environment that will stimulate strong investments by the private sector—both by local

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*Regulation can be obstructive or enabling. What Kenya's seed sector urgently needs is an enabling regulatory environment that will stimulate strong investments by the private sector.*

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However, additional steps are required. For example, the seed industry must increasingly shoulder the responsibilities of self-regulation, including implementing codes of ethics, and identifying and sanctioning violators. Agrodealers must be appropriately trained, licensed, monitored and sanctioned when in violation of good seed practices. KEPHIS must support and recognize increased private sector investment in internal quality control mechanisms.

companies with deep knowledge of local farmers and by multinational companies with significant research and development capabilities. This enabling environment also must clearly provide innovative solutions for producing seeds for crops other than hybrid maize, because they are currently at dangerously low levels.

## 5. History's Verdict: Winner or Loser?

The stakes are high, perhaps among the highest of any choices currently facing Kenya. Can we feed ourselves, plus a million new mouths per year? Will we enable our farmers to anchor a vibrant and productive agriculture sector? Will we be able to navigate climate change successfully? Will we continue to provide entry points for fake and low-quality seed that victimize already vulnerable farmers?

Whether we came of age in the 1970s or in the most recent decade, our goals are the same. We want to build a food-secure and prosperous Kenya where farming is environmentally sound, and we carefully and sustainably manage the amazing agricultural resources we all share.

At present, almost all indicators of success—crop yields, seed availability, food imports and exports, and food security—are going the wrong way. We must take action to change this, with the public and private sectors working together. The opportunity cost of failing to act wisely, and soon, is nothing short of our future well-being as a nation. How will history judge us? Because in the future, we cannot plausibly claim that we did not understand what was at stake.

Four decades from now, when the younger author of this paper is a grandfather and looks back with the perspective of the senior author, will Kenya's crop seed sector be seen as the spark that ignited an economic renaissance or will it be a source of regret and disillusionment? Will our economy follow the visionary path set by our Asian counterparts forty years ago, or will we remain saddled with an underperforming agriculture sector now tasked with feeding many millions more Kenyans? It is up to us to decide and, more importantly, to act. There are big payoffs we cannot afford to ignore.

### Top recommendations for consideration:

- 1** Set a market-driven course. Decide whether Kenya will be a donor- and government-driven seed sector or an industry-driven sector.
- 2** Define and provide sufficient funding to implement a clear KALRO research mandate, eliminating the need for KALRO to engage in small-scale commercial seed supply which then inhibits large-scale commercial seed supply.
- 3** Be farmer driven:
  - Give farmers information and choices.
  - Protect farmers by sanctioning companies, including agrodealers, that break rules.
- 4** Leverage technology, especially with young farmers, to improve adoption of quality inputs and deliver agronomic information on how to use those inputs.
- 5** Cultivate a regulatory environment that accelerates rather than stifles industry growth and investment—for both hybrid and non-hybrid seed.

# Endnotes

- 1 Kenya National Bureau of Statistics.
- 2 Ton Dietz, Dick Foeken, Sebastian Soeters & Wijnand Klaver  
In collaboration with Akinyinka Akinyoade, André Leliveld,  
Heleen Smits & Merel van 't Wout: Agricultural dynamics and  
food security trends in Kenya. Developmental Regimes in Africa  
(DRA) Project ASC-AFCA Collaborative Research Group: Agro-  
Food Clusters in Africa (AFCA) Research Report 2013-ASC-4.  
London/Leiden, January 2014.
- 3 FAO: The State of Food Insecurity in the World 2013, Rome.
- 4 IBP Kenya: Analysis of the 2016/17 National Budget Estimates,  
Kinuthia and Lakin, June 2016.
- 5 Kenya Financial Diaries – Shilingi Kwa Shilingi – the Financial  
Lives of the Poor. FSD Kenya. August 2014.
- 6 Famine Early Warning System (FEWS) FNET: Kenya Food Security  
Brief. December 2013.
- 7 World Bank, 2013.
- 8 Yeboah, Felix K., and T.S. Jayne. 2016. Africa's Evolving  
Employment Trends. International Development Working Paper,  
Michigan State University, East Lansing, MI.
- 9 World Bank's Kenya Economic Memorandum. 2016.
- 10 World Bank data.
- 11 Yeboah, Felix K., and T.S. Jayne. 2016. Africa's Evolving  
Employment Trends. International Development Working Paper,  
Michigan State University, East Lansing, MI.
- 12 KMT data (KEVEVAPI).



# Food Security & Crop Seed in Kenya

Big Payoffs We Cannot Afford to Ignore