The creation of agricultural enterprises represents one of the most effective ways to stimulate rural development. This chapter will review the efficacy of the policy tools used to promote agricultural enterprises, with a particular focus on the positive, transformative role that can be played by the private sector. Inspired by such examples, this chapter will end by exploring ways in which African countries, subregional, and regional bodies can create incentives that stimulate entrepreneurship in the agricultural sector. The chapter will take into account new tools such as information and communication technologies and the extent to which they can be harnessed to promote entrepreneurship.

Agribusiness and Development

Economic change entails the transformation of knowledge into goods and services through business enterprises. In this respect, creating links between knowledge and business development is the most important challenge facing agricultural renewal in east African countries. The development of small and medium-sized enterprises (SMEs) has been an integral part of the development of all industrialized economies. This
holds true in Africa. Building these enterprises requires development of pools of capital for investment; of local operational, repair, and maintenance expertise; and of a regulatory environment that allows small businesses to flourish. Africa must review its incentive structures to promote these objectives.¹

A range of government policy structures is suitable for creating and sustaining enterprises—from taxation regimes and market-based instruments to consumption policies and changes in the national system of innovation. Policy makers also need to ensure that educational systems provide adequate technical training. They need to support agribusiness and technology incubators, export processing zones, and production networks as well as sharpen the associated skills through agribusiness education.

Banks and financial institutions also play key roles in fostering technological innovation and supporting investment in homegrown domestic businesses. Unfortunately, their record in promoting technological innovation in Africa has been poor. Capital markets have played a critical role in creating SMEs in other developed countries. Venture capitalists not only bring money to the table; they also help groom small and medium-sized start-ups into successful enterprises. Venture capital in Africa, however, barely exists outside of South Africa and needs to be introduced and nurtured.

Much of the effort to promote venture capital in developing countries has been associated with public sector initiatives whose overall impact is questionable.² One of the possible explanations for the high rate of failure is that many of these initiatives are not linked to larger strategies to create local innovation systems. Venture capital is only one enabling species in a complex innovation ecosystem.³ It does not exist in an institutional or geographical vacuum and appears to obey the same evolutionary laws as other aspects of innovation systems.⁴ It is therefore important to look at examples of geographical, technological, and market aspects of venture capital. The legal
elements needed to create institutions are only a minor part of the challenge.

One critical starting point is “knowledge prospecting,” which involves identifying existing technologies and using them to create new businesses. African countries have so far been too isolated to benefit from the global stock of technical knowledge. They need to make a concerted effort to leverage expertise among their nationals residing in other countries. Such diasporas can serve as links to existing know-how, establish links to global markets, train local workers to perform new tasks, and organize the production process to produce and market more knowledge-intensive, higher value added agricultural products.

Advances in communications technologies and the advent of lower-cost high-speed Internet will also reduce this isolation dramatically. The laying of new fiber-optic cables along the coasts of Africa and, potentially, the use of lower-latency satellite technology can significantly reduce the price of international connectivity and will enable African universities and research institutions to play new roles in rural development. The further development of Internet exchange points (ISPs) in east Africa where they do not currently exist is also important. ISPs enable Internet traffic to be exchanged locally, rather than transverse networks located outside the continent, improving the experience of users and lowering the cost to provide service.

Much is already known about how to support business development. The available policy tools include direct financing via matching grants, taxation policies, government or public procurement policies, advance purchase arrangements, and prizes to recognize creativity and innovation. These can be complemented by simple ways to promote rural innovation that involve low levels of funding, higher local commitments and consistent long-term government policy.

For example, China’s mission-oriented “Spark Program,” created to popularize modern technology in rural areas, had
Entrepreneurship spread to more than 90% of the country’s counties by 2005. The program helped to improve the capability of young rural people by upgrading their technological skills, creating a nationwide network for distance learning, and encouraging rural enterprises to become internationally competitive. The program was sponsored by the Minister of Science and Technology.  

There is growing evidence that the Chinese economic miracle is a consequence of the rural entrepreneurship that started in the 1980s. This contradicts classical interpretations that focus on state-led enterprises as well as receptiveness to foreign direct investment. The creation of millions of township and village enterprises (TVEs) in provinces such as Zhejiang, Anhui, and Hunan played a key role in stimulating rural industrialization.

Over the past 60 years, China has experimented extensively with policies and programs to encourage the growth of rural enterprises that provide isolated agricultural areas with key producer inputs and access to post-harvest, value-added food processing. Despite the troubled early history, by 1995 China’s TVEs had helped bring about a revolution in Chinese agriculture and had evolved to account for approximately 25% of China’s GDP, 66% of all rural economic output, and more than 33% of China’s total export earnings.

Most of the TVEs have become private enterprises and focus in areas outside agricultural inputs or food processing. Agricultural support from TVEs remains relevant, however, particularly as a model by which other countries may be able to increase farmers’ access to key inputs such as fertilizers and equipment, as well as value-added processing of raw agricultural products.

With few rural-urban connecting roads and weak distribution systems, the Chinese government moved to resolve these agricultural input and post-harvest processing constraints by creating new enterprises in rural areas. China’s
initial rural enterprise strategy therefore focused on the so-called five small industries that it deemed crucial to agricultural growth: chemical fertilizer, cement, energy, iron and steel, and farm machinery. With strong backward linkages between these rural enterprises and Chinese farmers, agricultural development in China grew substantially in the late 1970s and 1980s through farmland capital construction, chemical fertilization, and mechanization.

This expansion in agricultural productivity, coupled with high population growth, led to a surplus of labor and a scarcity of farmland. As a consequence, China’s rural enterprises increasingly shifted from supplying agricultural producer inputs to labor-intensive consumer goods, for domestic and (after 1984 market reforms) international markets. From the mid-1980s to the 1990s, China’s TVEs saw explosive growth in these areas while they continued to supply agricultural producers with access to key inputs, new technologies, and food processing services. In 1993, 8.1% of total TVE economic output came from food processing, while chemicals (including fertilizer) accounted for 10%, building materials 12%, and equipment (including for farms) 18%.

The most successful TVEs were those with strong links to urban and peri-urban industries with which they could form joint ventures and share technical information; those in private ownership; and those with a willingness to shift from supplying producer inputs for farmers to manufacturing consumer goods for both domestic and international markets.

China’s experience with rural enterprises confirms that they may provide a mechanism through which developing states can enhance rural access to key agricultural inputs such as fertilizers and mechanization, as well as value-added post-harvest food processing. Rural enterprises may make the most sense in areas where farm-to-market roads cannot be easily established to achieve similar backward and forward linkages. In addition to sparking agricultural productivity and growth, rural enterprises
Entrepreneurship may also help provide employment for farm laborers displaced by agricultural mechanization. By keeping workers and economic activity in rural areas, China has helped expand rural markets, limit rural-urban migration, and create conditions under which it is easier for the government to provide key social services such as health care and education.

Despite the fact that TVEs enjoyed government support through financing and technical assistance, they enjoyed a degree of autonomy in their operations. The emergence of rural markets in China not only contributed to prosperity in agricultural communities, but it also provided the impetus for the modernization of the economy as a whole. Furthermore, the TVEs also became a foundation for creating entrepreneurial leadership and building managerial and organizational capacity.

Such entrepreneurial initiatives will succeed in the absence of consistent and long-term policy guidance on the one hand, and autonomy of action on the part of farmers and entrepreneurs, on the other hand. The latter is particularly critical because a large part of economic growth entails experimentation and learning. Neither of these can take place unless farmers and associated entrepreneurs have sufficient freedom to act. In other words, development has to be viewed as an expression of human potentialities and not a product of external interventions.

The Seed Industry

The seed sector in sub-Saharan Africa is dominated by informal supply systems with farm-saved seeds accounting for approximately 80% of planted seeds. Improving smallholder farmers’ access to new high-yielding varieties and hybrid crops requires better coordinated marketing efforts and expanded distribution systems. Because of their small size and market orientation,
small to medium-sized emerging seed companies have a potential competitive advantage in meeting the needs of smallholder farmers. Emerging seed companies—the nexus of publicly supported agricultural biotechnology and newly created market opportunities for the private sector—can promote food security and welfare improvement within economically disadvantaged rural communities.\textsuperscript{10}

However, these emerging domestic companies have limited financial and managerial resources and are often hampered by complex and bureaucratic legal frameworks. As infants in the industry, small to medium-sized domestic seed companies need short-term assistance, especially in establishing a solid financial base and developing management capacity.

Maize is a staple in southern and eastern Africa, yet the amount of produce and the acreage of maize have not increased much over the years, even though the number of grain producers has quadrupled. However, the seed sector faces major challenges. Although less monopolized now, the seed sector in a majority of African countries is far from being efficient. The seed industry suffers from five levels of bottlenecks, producing an adverse effect on the maize seed value chain across the region. The first bottleneck is government political and technical policies. Import procedures, for instance, are cumbersome enough in Tanzania to dissuade seed import while in Zimbabwe, during the economic crisis, the government banned seed exports.\textsuperscript{11}

Second, establishing a seed company has a high initial cost, requiring access to credit; the company also needs qualified manpower. Third, the production of seed suffers from a lack of adequate and adapted input, from expensive production costs and lack of production credit, and from poor weather and unfavorable land policies. Fourth, poor infrastructure in the value chain, such as poor retail networks or sales points, jeopardize marketing and access to the farmers. Last, farmers tend to have low demand for seeds.
Millet and Sorghum Production in India

Millions of small-scale farmers in India live in harsh environments where rainfall is limited and irrigation and fertilizer are unavailable. In these harsh areas, many farmers have long grown sorghum and pearl millet—hardy crops that can thrive in almost any soil and survive under relatively tough conditions. Production from these crops was low, however, and so were returns to farmers, until improved, higher-producing varieties were developed and distributed starting in the 1970s. Since then, a succession of more productive and disease-resistant varieties has raised farmers’ yields and improved the livelihoods of about six million millet-growing households and three million sorghum-growing households. Although public funding was the key to developing this improved genetic material, it has been private seed companies that have helped ensure that these gains were spread to, and realized by, the maximum number of Indian farmers.

The success and sustainability of these improved varieties resulted from interventions by the Indian government and the international community, as well as the increasing inclusion of private industry and market-based solutions in seed sale and distribution. Three key interventions include increased investments in crop improvements during the 1970s; the development of efficient seed systems with a gradual inclusion of the private sector in the 1980s; and the liberalization of the Indian seed industry in the late 1990s. By allowing farmers to grow the same amount of millet or sorghum using half as much land, these improved varieties have made it possible for farmers to shift farmland to valuable cash crops and thereby raise their incomes. Our analysis will focus on the key role played by the last of these three innovations, the establishment of a private seed industry.
Government Investment in Research

The first advances in millet and sorghum research in India resulted from the efforts of a range of government institutions. These programs organized government research and in many locations tested for improved characteristics of hybrids and varieties—through state agricultural universities, research institutes, and experiment stations. Joint efforts by these institutions resulted in the release of a succession of pearl millet hybrids offering yield advantages. Since the mid-1960s, average grain yields have nearly doubled, even though much of the production of millet has shifted to more marginal production environments. Production of pearl millet in India currently stands at nine million tons, and hybrids are grown in more than half of the total national pearl millet area of 10 million hectares.

Cultivating the Seed Industry

At the beginning of the Green Revolution, the Indian government and key state governments decided that state extension services and emerging private seed companies could not distribute enough seed to allow for the large-scale adoption of new varieties. The government decided to create state seed corporations, the first of which evolved out of the G. B. Pant University of Agriculture and Technology in Pantnagar. This corporation then became a model for the National Seed Corporation and other state seed corporations.

The Indian government, with the financial support of the World Bank and technical assistance from the Rockefeller Foundation, financed the development of state seed corporations in most major Indian states in the 1960s. Gradually, these state seed corporations replaced state departments of seed production and formed the nascent foundations of a formal seed industry. Often, formal seed industries are taken for granted,
especially in industrial countries, where agriculture is extremely productive. But in India, as in many other countries, seed industries are still emerging. The problem stems from the limited profitability of seeds. When farmers are able to plant and save seeds from one season to the next without losing much in terms of yield and output, there is little need for them to purchase new seeds—and little opportunity for seed producers to sell new seeds.

It is only when commercial seeds offer clear advantages in terms of quality and performance that farmers become more willing to purchase them. When improvements are bred into a crop, for example, farmers must buy or otherwise gain access to the improved seed to realize the benefits of breeding. Farmers must also buy seeds to realize the full benefits of hybrids, the yields of which tend to drop when grain from harvests is saved and planted in the next season. But seed industries do not emerge simply by themselves. The right rules and regulations must be in place to encourage private investment in the industry and to limit the role of the public sector where it is a less-efficient purveyor of seed to farmers. In India, this institutional framework for the development of a seed industry emerged with the Indian Seed Act in 1966. The nascent Indian seed industry was heavily regulated under the act, however, with limited entry and formation of large private firms—domestic or foreign. Private seed imports for both commercial and research purposes were restricted or banned, ostensibly to protect smallholders from predatory corporate practices.

**Emergence of the Private Seed Industry**

Since the 1970s, the private sector has played an ever-increasing role in developing improved varieties of millet and sorghum and distributing them to farmers through innovative partnerships with public sector agencies. In 1971, India began
deregulating the seed sector, relaxing restrictions on seed imports and private firms’ entry into the seed market. This change, combined with a new seed policy in 1988, spurred enormous growth in private sector seed supplies in India. Currently, the Indian market for agricultural seed is one of the biggest in the world.

Sorghum and pearl millet breeding by private companies began around 1970, when four companies had their own sorghum and pearl millet breeding programs. By 1985 this number had grown to 10 companies. In 1981, a private company developed and released the first hybrid pearl millet. One major reason for the spurt in private sector growth was the strong public sector research on sorghum and millet. International agricultural research centers such as the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) exchanged breeding material with public and private research institutions. National agricultural research centers such as the Indian Council of Agricultural Research (ICAR) and agricultural universities provided breeder seed not only to the national and state seed corporations but also to private seed companies to be multiplied and distributed through their company outlets, farmer cooperatives, and private dealers. For private firms, public institutions like ICRISAT, ICAR, and state universities provided invaluable genetic materials, essentially free of charge.

Today, more than 60 private seed companies supply improved pearl millet to small-scale farmers and account for 82% of the total seed supply, while more than 40 companies supply improved sorghum, accounting for 75% of supply. Many of these companies benefit not only from the availability of public research on improved pearl millet and sorghum but also from innovative partnerships that specifically aim to disseminate new materials to the private sector. The most recognized of these partnerships is ICRISAT’s hybrid consortia, developed in 2000–01. Private companies pay a membership fee to ICRISAT to receive nonexclusive access to hybrid parent
lines that they can then use for the development and marketing of their own seed products. Although no single company has a monopoly over an individual line—all companies can use them for their own purposes as they choose—the market is currently large enough to allow all companies to compete for the smallholders’ business.

The ultimate beneficiaries of this public-private system are the millions of small-scale farmers who grow sorghum and millet. Public research agencies contribute genetic materials and scientific expertise to improve crop varieties when the incentives for private sector involvement are limited. Then, private companies take on the final development of new varieties and seed distribution—tasks to which they are often better suited than are public agencies. In this way, the benefits of crop improvements are delivered directly to farmers, who find them worthwhile enough to support financially.

All three elements of the Indian intervention to improve sorghum and pearl millet hybrids were important. First, the investments in public sector plant-breeding and crop-management research were made by the national government, state governments, and international agricultural research centers. When hybrids of sorghum and millet were first being developed, all three of these groups contributed genetic material that benefited farmers directly and provided the basis for private researchers to develop new varieties. Second, the government invested in seed production in public and private institutions. The Indian government and state governments, with the help of donors, made major investments in government seed corporations that multiplied the seeds of not only wheat, rice, and maize, but also pearl millet and sorghum. Seed laws were written and enforced to allow small private sector seed companies to enter the seed business and make profits. The government also provided training for people involved in the seed industry in both public and private institutions.
Third, and most important, India liberalized the seed sector starting in the mid-1980s. Instead of allowing state seed corporations to become regional monopolies, the government opened the doors to investment by large Indian firms and allowed foreign direct investment in the sector. This change, coupled with continuing investments in public plant breeding and public-private partnerships, has continued to provide private firms with a steady stream of genetic materials for developing proprietary hybrids. India also benefits from a seed law that allows companies to sell truthfully labeled seed without having to go through costly and time-consuming certification and registration processes for new hybrids and varieties. The result is a vibrant and sustainable supply of seed of new cultivars that are drought tolerant and resistant to many pests and diseases.

Africa’s Seeds of Development Program

The Seeds of Development Program (SODP) is designed to improve access to appropriate, good quality, and competitively priced crop seeds for low-income smallholder farmers in east and southern Africa. This has been achieved by focused management training for over 30 small to medium-sized local seed companies in the region such as Vitoria Seeds in Uganda, Freshco Seeds in Kenya, Kamano Seeds in Zambia, Qualitá in Mozambique, and Seed Tech in Malawi. Utilizing a grant from the UK Department for International Development (DFID), which was issued in 2006, SODP aims to achieve the purpose through two main outputs. The first output is to increase the scale of the program by enrolling additional participants from countries already involved in SODP and, in addition, bringing new countries into the program. The second output is to increase the scope of the program through widening program activities.
SODP management training is showing results, with SODP companies selling seed around 20% cheaper than their larger competitors. SODP networking is also providing new ways of doing business and opportunities for partnerships across countries. The link with the Alliance for a Green Revolution in Africa has proved useful for some of the companies. In the proposed follow-up SODP program, a major focus of development will be facilitating effective alliances between the two main SODP fellow categories (full service seed companies and seed traders) to enable each to exploit their niche within the smallholder market for seed.

SODP is an innovative program, valued by its participants. Performance indicators are impressive—maize seed sales up by 54% between 2006 and 2007; full-time employment up by 19%; and sales revenue up by 35%. Company sales data also show that the bulk of sales (more than 80%) go to smallholder farmers. By offering a wider variety of seeds, including higher-yielding, disease- and drought-resistant varieties, and other inputs such as fertilizers, SODP companies help smallholder farmers increase food security for their families and communities. The evidence available shows that SODP members are producing and selling seed to smallholders at significantly lower prices than their larger-scale competitors.

Food Processing

Transformations in the food processing sectors of developing countries are increasingly seen as strategic from the point of view of export earnings, domestic industry restructuring, and citizens’ nutrition and food security. The widespread adoption by developing countries of export-led growth strategies has drawn attention to the economic potential of their food processing sectors, particularly in the light of the difficulties faced by many traditional primary commodity export markets. Food processing can be understood as post-harvest activities
that add value to the agricultural product prior to marketing. In addition to the primary processing of food ingredients, it includes, therefore, final food production on the one hand and the preparation and packaging of fresh products. To better understand the role of food processing in African agricultural development, this chapter will examine several cases of successful African food processing start-ups as well as the role new technologies (particularly radio and video) can play in teaching farmers how to add value with post-harvest processing.

Homegrown Company, Ltd., Kenya

Homegrown Company, Ltd., is a success story of production and export of packaged horticulture produce from Kenya. The company ventured into Kenya in 1982 and focused on the processing and export of vegetables to the UK market. The business strategy has been the production and packaging of produce at source so that it can be exported ready for the market outlet without further packaging abroad. To ensure the desired quality and supply of fresh produce, it was important for Homegrown to enter into partnerships with local farmers to complement its own production. Through this partnership the company is able to source about 25% of the total requirement from contracted farmers, and in some cases such as French beans, 100% of the total requirement.¹⁵

All farmers supplying to the Homegrown Company, Ltd., have a supply contract. The contract is explicit in terms of the commodity to be supplied, the period of supply, and the desired quality and quantity to be supplied. This implies that farmers on contract are able to work out their production schedules and put in place the necessary inputs to meet the contract quantities and quality. By implication also, farmers agree to follow the recommended crop husbandry so as to maintain the required quality. This contractual arrangement
Entrepreneurship was initiated by the company as a strategy for achieving optimal resource use in the export of fresh produce from Kenya. Through this strategy, the company has its own nucleus of farm production units to meet a certain level of its requirements and a network of farmers contracted to provide the balance. Contracts entered with farmers for the supply of various types of fresh farm produce explicitly indicate the price as well as other quality dimensions that are important for delivery of the desired produce.

By entering into a supply contract, farmers enjoy the benefits of an assured market for their farm produce while at the same time benefiting from the fact that their farming activity risk is minimized by the certainty with which their production decisions are made. Farmers enjoy an assured price for the various grades of farm produce that they deliver to the contracting company. Due to the relative involvement of the contractor in the production process, farmers are supplied with the latest farming technology, such as the latest crop varieties and crop husbandry techniques. This has been particularly notable in the production of garden peas. The provision of technical extension by the contractor has played a key role in ensuring that farmers are able to optimize their production in terms of quality and quantity. Homegrown Company, Ltd., also supplies fertilizers, and agro-chemicals on credit to those farmers who need material credit so they can produce the expected quantities and qualities.

**Sampa Jimini Cooperative Cashew Processing Society, Ghana**

Sampa Jimini Cooperative Cashew Processing Society, located in Brong-Ahafo, was established in 1994 with the help of Technoserve, an American NGO. There are 18 workers, including one factory manager and two assistants. Membership of the Sampa Processing Society is 55. The society has elected executives and operates on the guidelines of a cooperative. In
1994, two processing societies were formed. The Department of Cooperatives provided the requisite training on the operation and management of the societies. In 1995, Technoserve sponsored training in processing in Nigeria and helped with the acquisition of equipment. Processing started in the year 2000.¹⁶

Four tons of raw nuts were processed into 1.14 tons of kernel. Between 2001 and 2002, 15 tons of raw nuts were purchased and processed. The kernels are sold to Golden Harvest Company, Ltd., in Accra. In 2002, the buyer started experiencing problems with the marketing of the kernels, which has affected prompt payment to the Society. As a result, the Society has looked for other marketing outlets such as the Indian community in Tamale and other sales outlets in Accra.

Vertical and horizontal farm-agribusiness linkages existed in cashew nut production. These linkages, however, were informal with no written contracts. Four types of linkages were functional at the time of the study: between farmers and the processing society; between society and Technoserve for business development services and technical advice; between the processing society and Golden Harvest Company, Ltd., for final processing; and between Golden Harvest and Technoserve for business development services, training, and technical advice. Farmers supply the processing society with raw nuts for processing. The processing society in turn educates the farmers on the best treatment and drying practices to get good nuts that attract a premium price. Technoserve encouraged the formation of the farmers’ association and the processing society, organized training on cooperative organization, and introduced the society to financial institutions.

The linkage between the processing society and the marketing company has also been facilitated by Technoserve to ensure a ready market for the society’s products. The connection is strengthened by the fact that the processing society owns 60 million shares of Golden Harvest, which in return...
provides training and information on international market developments. There were no contractual agreements. Technoserve played a significant role in establishing the connections observed in this case by introducing the concept of value addition by sponsoring training programs. Technoserve initiated all the linkages with the marketing firms and the other government institutions such as the Department of Cooperatives.

Blue Skies Agro-Processing Company, Ghana

Blue Skies Agro-processing Company, Ltd., is located about 25 km from Accra. The company processes fresh fruits for supermarkets in some European markets. Fruits processed include pineapple, mangoes, watermelon, passion fruit, and pawpaw. While most fruit is procured in Ghana, supply gaps are filled by imports from South Africa, Egypt, Kenya, Brazil, and the UK. The company started with 38 workers and has since increased the workforce to 450, 60% of whom are permanent staff. The processed products of the company conform to the standards of the European Retailer Partnership Good Agricultural Practices (EUREGAP). In the last four years the company has grown tremendously, expanding its processing facilities. Through good extension services and training of farmers, coupled with higher price offers, the company rapidly increased its processing capacity from 1 ton per week to about 35 tons per week. Blue Skies is known to pay its farmers promptly and also to offer a higher price per kilogram of pineapple.

Farmers receive technical training and advice from the processing company free of charge to ensure that their produce meets the company’s quality standards. Committed and loyal farmers can also purchase inputs and equipment interest free. Only farmers who are EUREPGAP certified are obliged to sell to the company because of the investment the company makes in getting farmers certified. There is a ready market for Blue
Skies’ products in the EU market. The company is committed to supplying products on time and in the right quantities to supermarkets. To help its farmers, Blue Skies provides its dedicated farmers with credit and has worked to improve road infrastructure near farms and enhance access by company trucks.

Communication Technology in Food Processing

Conventional media, radio, and video are powerful, accessible, and relevant forces of agricultural innovation and transformation in Africa. Two-thirds of rural women creatively applied ideas illustrated by videos demonstrating improved food processing techniques compared to less than 20% who attended training workshops in Cotonou, Benin. The power of radio and video programming is not adequately recognized and accorded sufficient attention by Africa’s policy makers, stifling the potential of these media to unleash farmer innovations. Farmers’ innovations are often shaped by capital limitations and mainly rely on locally available resources, of which knowledge is key.

Video provides a powerful, low-cost medium for farmer-to-farmer extension and for exposing rural communities to new ideas and practices. A recent study examined the impacts of educational videos featuring early adopting farmers demonstrating the use of new technologies and techniques. The study found that when women watched videos featuring fellow farmers demonstrating new techniques, they showed better learning and understanding of the technology and creatively applied its central ideas. Innovation levels of 72% were recorded in villages where videos were used to introduce women to improved rice processing techniques. This can be compared to 19% innovation among farmers who attended training workshops. When women who had attended training
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workshops watched the videos, the innovations increased to 92%.

Watching videos spurred greater innovation than did conventional farmer training techniques. Notably high levels of creativity (67%) were recorded among women who did not have access to the rice processing technology featured in the video. The adaptations by Benin women to improve rice processing after having watched the video illustrate the power of video to quickly stimulate creativity among rural people, who are often seen as much more passive technology consumers. Besides being more powerful, video may also be able to reach more people than conventional training workshops. Drawing lessons from a similar rural learning initiative undertaken in Bangladesh, the Africa Rice Center with a wide range of partners is using local language videos to train farmers on various facets of rice production and processing in Benin, Ethiopia, Gambia, Ghana, Nigeria, and Senegal, among other countries.

By 2009, the rice videos had been translated into 30 African languages and were being used by more than 400 community-based organizations across Africa to strengthen their own capacity in rice technologies. The videos, which are disseminated through mobile cinema vans or local organizations, have been viewed by about 130,000 farmers across Africa, reaching three times as many farmers as face-to-face farmer training workshops. Partner organizations in various countries are combining the videos with radio programming to reinforce the lessons and knowledge.

In Guinea, one radio station, Radio Guinée Maritime, has aired interviews with farmers involved in this program reaching some 800,000 listeners, an experience that has been replicated in Gambia, Nigeria, and Uganda. To effectively capitalize on the potential of radio and video technologies in Africa, proponents advise broadening the dissemination of innovations beyond those developed by the traditional
research and extension systems to include localized farmer innovations also.

**Social Entrepreneurship and Local Innovations**

Social enterprises are emerging as major economic players worldwide. Their role in African agriculture is growing. An example of such an initiative is the One Acre Fund, a non-profit organization based in Bungoma (western Kenya) that provides farmers with the tools they need to improve their harvests and feed their families. Life-changing agricultural technologies already exist in the world; One Acre Fund’s primary focus is on how to distribute these technologies in a “farmer-usable” way, and how to get farmers to permanently adopt these technologies. One Acre Fund currently serves 55,000 farm families (with 275,000 children in those families) in Kenya and Rwanda.

From the beginning, One Acre Fund talked to farmers to understand what they need to succeed: finance, farm inputs, education, and access to markets. One Acre Fund offers a service model that addresses each of these needs. When a farmer enrolls with One Acre Fund, she joins as part of a group of 6 to 12 farmers. She receives an in-kind loan of seed and fertilizer, which is guaranteed by her group members. One Acre Fund delivers this seed and fertilizer to a market point within two kilometers of where she lives and a field officer provides in-field training on land preparation, planting, fertilizer application, and weeding. These trainings are standardized across One Acre Fund’s entire operation and include interactive exercises, simple instructions, and group modeling of agriculture techniques. For instance, after a field officer teaches a group of farmers how to use a planting string to space rows of crops, he asks them to model the technique in the field so that he can offer immediate feedback.
Over the course of the season, the field officer monitors the farmer’s fields. At the end of the season, he trains her on how to harvest and store her crop. One Acre Fund also offers a harvest buy-back program that farmers can participate in if they choose. Final loan repayment is several weeks after harvest—98% of farmers repay their loans.

Before joining One Acre Fund, many farmers in Kenya were harvesting five bags of maize from half an acre of land. After joining One Acre Fund, their harvests typically increase to 12 to 15 bags of maize from the same half acre of land. This represents a doubling in farm profit per planted acre—twice as much income from the same amount of land.

The field officer is the most important part of the One Acre Fund service model. These field officers are typically recruited from the communities in which they work. One Acre Fund consciously chooses not to hire university-educated horticulturists for its field staff (like most NGOs) because most of the information farmers need to know is encapsulated in a few simple lessons. The Fund prefers to employ down-to-earth, hardworking staff—many of whom are farmers themselves—who have strong leadership potential within their own communities.

One Acre Fund’s field officers each work with roughly 120 farmers, and they visit each of their farmers on a weekly or biweekly basis. At these meetings, they conduct trainings, check germination rates, troubleshoot problems in the field, and collect repayment. Over the course of the season, One Acre Fund’s field officers cultivate a strong bond with their farmers. They respect the feedback their farmers give them about farming techniques and One Acre Fund’s program. In turn, One Acre Fund farmers have a deep appreciation for how knowledgeable their field officers are and how hard they work to serve their customers. Many farmers call their field officers “teacher.”

Local innovations represent one of Africa’s least recognized assets. For more than 20 years India’s Honey Bee Network and
Society for Research and Initiatives for Sustainable Technologies and Institutions have been scouting for innovations developed by artisans, children, farmers, women, and other community actors. They have built a database of more than 10,000 innovations.22

To further the work, India’s Department of Science and Technology created the National Innovation Foundation (NIF) in 2000. Its aim is “providing institutional support in scouting, spawning, sustaining and scaling up grassroots green innovations and helping their transition to self supporting activities.” NIF has so far filed over 250 patent applications for the ideas in India, of which 35 have been granted. Another seven applications have been filed in the United States of which four have been granted.

To facilitate the commercialization and wider application of the innovations, NIF works with institutions such as the Grassroots Innovations Augmentation Network, which serves as a business incubator. Some of the objectives of the Honey Bee Network are now part of the work of the Prime Minister’s National Innovation Council. Africa’s diversity in agricultural and ecological practices offers unique opportunities for creative responses to local challenges. Such responses form a foundation upon which to supplement formal institutions with entrepreneurial activities driven by local innovations.

**Conclusion**

Despite strong growth in the private seed sector in Africa over the last decade, most of Africa’s millions of small-scale farmers lack easy access to affordable, high-quality seeds. Seed policies and regulations currently differ across African countries, limiting opportunities for trade and collaboration. However, efforts are under way to develop regional trading blocs in the seed industry. For example, across the 14 Southern Africa Development Community (SADC) countries, seed industry
stakeholders have been formulating a single policy document to enable companies to move seed and breeding material across national borders, register varieties more easily, and market their products regionally. A parallel initiative is under way for East African Community (EAC) countries. These efforts need to be finalized in east and southern Africa, replicated across all Africa’s subregional organizations, and complemented by parallel efforts in the African Union.

Like the formation of African seed companies, the creation and spread of value-added food processing enterprises could help African farmers retain a higher portion of the profits from the materials they produce. Food processing could also help reduce the threat of hunger by increasing the number of protein- and vitamin-rich products provided by the local market, as well as improve local incomes by tapping into international markets to get much needed export revenues from agriculture. Unlike the situation with seeds, growth in food processing will require fewer changes in government and regional policies. The key change will need to come in the areas of capital, so it is easier for individuals and companies to invest in the infrastructure, equipment, and training necessary to enter the food processing industry.