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BACK TO THE FUTURE

Reversing Recent Trends for Food Security in Eastern Africa

Steven Were Omamo



Recent trends in agricultural growth and food security in Eastern and Central Africa (ECA) have been discouraging. With very low labor productivity, yields, and growth rates, agriculture is unable to keep up with population growth or achieve the type of pro-poor growth needed to reduce poverty dramatically. Yet agriculture accounts for about half of the region's gross domestic product (GDP) and is the main source of livelihood for the majority of the population. Behind this gloomy picture, however, lies agriculture's potential to be the engine for growth in ECA. What do the ECA countries need to do to effectively exploit the potential of agriculture and meet the needs of their burgeoning populations?

RECENT TRENDS IN ECA AGRICULTURE

ECA is made up of 12 countries (Burundi, Democratic Republic of Congo [DRC], Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Sudan, Tanzania, and Uganda), covering an area of 9.5 million square kilometers, with a total population of more than 300 million people. Most of these people live in rural areas and pursue agricultural livelihoods, and about one-third of the region's total land area is devoted to agricultural uses. The distribution of the region's GDP closely matches that of its agricultural GDP; countries with relatively large national economies also have relatively large agricultural economies, and vice versa.

Land productivity—agricultural output per hectare—has increased steadily in recent decades in ECA, but labor productivity—agricultural output per worker—has declined substantially. This decline is greatest in DRC, Kenya, Madagascar, Malawi, and Tanzania. Labor productivity in Ethiopia, Rwanda, Sudan, and Uganda has recovered substantially in recent years, mainly owing to reductions in civil strife.

Given these trends in agricultural productivity, it is not sur-

prising that average yields for the region's major crops currently fall well below those elsewhere in Africa, and even further below global levels. Only for cassava, beans, coffee, and tea do the region's yields compare favorably with average African and global levels.

These trends in productivity growth have translated into poor overall agricultural growth rates in individual countries and for the region as a whole. Overall performance of agriculture in ECA in 1993–2003 was slightly better than in the preceding decade (Table 1). But at 2.73 percent, annual agricultural growth did not keep pace with population growth, which stood at close to 3 percent over this period.

Slow agricultural productivity growth in the region has major implications for aggregate relationships among agricultural production, consumption, and trade in the region. Most countries in ECA are net importers of their main agricultural commodities. Only coffee, tea, fruits, and vegetables are consistent exports from the region, with Kenya, Tanzania, Uganda, and Ethiopia accounting for the largest shares of those exports. Kenya is also the region's principal importer of agricultural commodities.

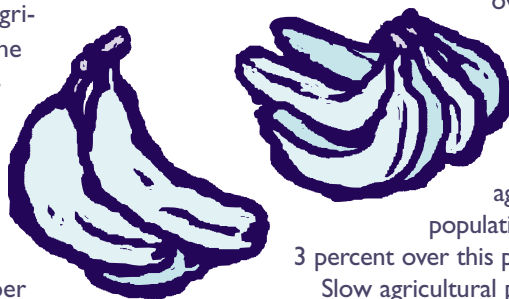


Table 1—Agricultural growth rates (%) in ECA, Sub-Saharan Africa, and developing countries, 1983–2003

Region/country	Crops		Livestock		Total	
	1983–93	1993–2003	1983–93	1993–2003	1983–93	1993–2003
Eastern and Central Africa	1.33	2.91	2.25	2.55	1.79	2.73
Sub-Saharan Africa	3.81	2.78	1.77	2.31	3.16	2.65
Developing countries	2.83	2.92	4.96	4.19	3.46	3.35

Source: FAOSTAT, November 2004.

Note: Compound annual average growth rates are from regression estimates. Value of agricultural production is expressed at constant 1989–1991 international prices. Sub-Saharan Africa includes South Africa.

RECENT TRENDS IN NUTRITION AND FOOD SECURITY

Because of low productivity in the agricultural sector, which employs and sustains most of the region's population, hunger and malnutrition have deepened in the region in recent years.

Between 1979 and 2000, the number of malnourished adults in ECA grew at a faster rate than did overall population. Rates of child undernutrition and child mortality—which is closely linked to

undernutrition—stood above those for Sub-Saharan Africa and other developing regions of the world.

The picture that emerges for ECA is therefore one of a region progressively less able to meet the food needs of its burgeoning population. With agriculture looming so large in most national economies, sluggish growth in agricultural productivity has translated into sluggish overall growth and generally low per capita income. High levels of agricultural importation—particularly of staples—appear to only partially fill the consumption needs of a population lacking purchasing power. The result is high levels of adult and child malnutrition and towering child mortality rates.

TAPPING THE POTENTIAL OF AGRICULTURE IN ECA

Recent research points to the kinds of policy reforms and institutional innovations that would deliver broad-based growth and poverty reduction in ECA. A clear priority is productivity growth in agricultural subsectors where there is high and growing demand in the region, including for livestock products, major staples, oilseeds, fruits, and vegetables. Specific opportunities for action are likely to vary geographically:

In areas with relatively high agricultural potential but poor infrastructure and low population density, one viable option is more intensive production of key nonperishable commodities. Staples are likely to continue to feature prominently in these zones, as are oilseeds and traditional cash crops like coffee and tea. Productivity growth in livestock systems would be extremely rewarding in these areas but should be approached carefully given the perishability of livestock products. Such areas can be found in all ECA countries, including most of central DRC; southern Sudan; parts of Kenya, Tanzania, and central Uganda; and widely scattered areas in Ethiopia and Madagascar.

In areas with low agricultural potential and low population density, livestock systems undergird livelihoods. Improved animal health, breeding for disease resistance, and improved animal nutrition and pasture management would be good triggers for broad-based productivity growth. Such investments should be accompanied by measures to help herders accommodate the increased risk that is often associated with more intensive production practices. Areas falling into this category include low-lying arid and semi-arid regions of Ethiopia and Eritrea, central Sudan, southeastern Kenya, and eastern DRC.

In areas with high agricultural potential and high population density, natural ecosystems are under pressure from low agricultural productivity growth coupled with growing food demand. To raise productivity growth and solve problems like soil nutrient depletion, soil erosion, pests, and weeds, farmers could pursue high-value livelihood opportunities featuring intensive use of improved technologies. Many such technologies

already exist but are knowledge intensive, and structures and processes will be needed to promote sustained learning by farmers and service providers. Areas falling into this category are found mainly in ECA's high, wet zones—for example, much of Burundi and Rwanda, central Kenya, western Uganda, north-eastern Tanzania, and parts of the Ethiopian highlands.

Potential Strategies and Areas for Investment

Productivity growth without significant improvements in market functioning is counterproductive. Physical impediments to agricultural trade and exchange related to poor infrastructure remain high in ECA. With major investments in roads, railways, and telecommunications, the scope for sustained agricultural productivity growth in ECA will be greatly enhanced. Ongoing efforts to overcome institutional constraints to market development are particularly promising. These efforts include smallholder-oriented market information systems and commodity exchanges and smallholder collective action to reduce transaction costs, enhance quality of output, and improve access to new markets.

Growth in nonagricultural sectors is also essential to sustained growth in the agricultural sector, because it provides crucial off-farm employment and income opportunities for rural populations, as well as generating demand for agricultural products.

In some areas high transport costs and other structural factors isolate local economies from outside sources of effective demand for local products. Improvements in storage, processing, and distribution can promote demand for income-generating enhancements in local products. Milk and oilseeds appear to be especially promising target commodities because their markets are large and their potential for value addition via agroprocessing and other forms of agroindustrialization is high.

In areas where external trade is a more viable option and a lack of tradable commodities is a clear constraint on growth, improved agroprocessing, distribution, and provision of farm inputs are likely to be important. Under market liberalization, the private sector's willingness and ability to invest in these functions may depend on the presence of measures like improved market information systems and preferential tax schemes.

The Promise of Regional Cooperation

Regional agricultural development initiatives are likely to have significant returns. Since many crops are grown throughout the region, opportunities to develop regional agricultural R&D initiatives should be exploited. In addition, the potential for modern biotechnology to spur productivity growth is controversial but cannot be ignored. Development of regional biosafety frameworks and intellectual property rights regimes may help the region overcome the tensions raised by biotechnology and avoid wasteful duplication of effort.

Similarly, most market-related constraints occur throughout the region. Solutions identified in one country may apply in others. Information sharing can reduce learning costs. Where mar-



ket constraints are linked to poor infrastructure, regional initiatives to improve rural infrastructure and to remove barriers to movement of goods may generate high returns.

Cross-sectoral linkages have both national and regional manifestations. For instance, measures that target sustained growth in, say, both plant husbandry and agroprocessing might require national action to ensure that farmers and traders have access to key technologies and information, as well as regional action to standardize grades and quality requirements.

ECAPAPA-IFPRI PARTNERSHIP

The Eastern and Central Africa Programme for Agricultural Policy Analysis (ECAPAPA) and the International Food Policy Research Institute (IFPRI) are jointly implementing a regional research program to respond to the development challenges in the 12 ECA countries. This set of six briefs summarizes recent research by IFPRI and ECAPAPA aimed at building understanding about policy reforms and institutional innovations that could promote growth, poverty reduction, and food security in Africa.

The brief *East Africa: Seed Policies* summarizes the outcomes of regional consultative processes on seed policy that are being convened and backstopped by ECAPAPA. These processes aim to promote cross-border trade and exchange of seed by rationalizing and harmonizing policies, regulations, and standards in national seed industries. Dialogue, analysis, and action involving seed traders, public officials, and scientists in a number of ECA countries have resulted in agreements on uniform standards and procedures for seed variety evaluation and release, with major cost savings and expansions in trade.

The brief *Uganda & Tanzania: Pro-Poor Public Investment* describes research on the impacts of public investments on growth and poverty in those two countries. Impacts are shown to differ by economic sector and by geographic location, suggesting the need for careful prioritization and targeting.

Uganda: Income Strategies and Land Management summarizes research on land management practices and smallholder income strategies in Uganda. It provides significant insight into the complex relationships among smallholder household livelihood strategies, individual and collective natural resource management practices, poverty, and alternative policy measures. Tradeoffs among key policy objectives are identified.

Another brief, *Ethiopia: Growth Options and Poverty Reduction*, outlines research on policy strategies for achieving broad-based growth and poverty reduction in Ethiopia. Agriculture is revealed

to have the potential to play a major role in pro-poor growth in Ethiopia, with growth in the staple crop and livestock sectors identified as especially fruitful.

Ethiopia: Livelihoods, Growth, and Markets summarizes research on the importance of local and regional urban centers to rural livelihoods in Ethiopia. Research results demonstrate that local market towns and cities are important focal points for rural household economic activity. Differential access to these locations is shown to have important growth and welfare impacts in rural areas.

Finally, *Kenya: Property Rights* is based on research on collective action, property rights, and livestock economies in Kenya's pastoral areas. Conditions in factor and output markets, population pressure, herders' attitudes toward risk and change, and social and political institutions governing land tenure security are found to jointly influence collective decisionmaking in ways that increase the economic vulnerability of pastoralists. ■

FOR FURTHER READING

- X. Diao, M. Johnson, S. Gavian, and P. Hazell. 2005. *Africa without Borders: Building Blocks for Regional Growth*. Issue Brief 38. International Food Policy Research Institute, Washington, DC.
- X. Diao and P. Hazell. 2004. *Exploring Market Opportunities for African Smallholders*. 2020 Africa Conference Brief 6. International Food Policy Research Institute, Washington, DC.
- S.W. Omamo and K. von Grebmer. 2005. *Dialogues: The Shaping of Biotechnology in Southern Africa*. Issue Brief 36. International Food Policy Research Institute, Washington, DC.
- S.W. Omamo. 2004. "Bridging Research, Policy, and Practice in African Agriculture." *Development Strategy and Governance Discussion Paper No. 10*. International Food Policy Research Institute, Washington, DC.

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EAST AFRICA

SEED POLICIES

Isaac Minde

HARMONIZING SEED POLICIES AND REGULATIONS IN EASTERN AND CENTRAL AFRICA

The countries of Eastern and Central Africa are heavily dependent on agriculture, and seeds are a key input in agricultural production. Yet in each country in Eastern and Central Africa, the seed industry faces different laws, standards, and regulations, which are costly to meet. Some of the laws, regulations, and administrative and technical procedures that each country imposes are restrictive, impede trade, and place unjustifiably discriminatory demands on importers, exporters, and even domestic producers of seed. If agriculture is to be competitive in Eastern and Central Africa, then the seed industry within the region needs to be improved. Harmonizing the countries' seed laws, policies, standards, and regulations could help establish a regional market with enough demand to stimulate a viable and efficient seed industry. A regional seed market would, among other things, promote regional trade, create economies of scale for developing and marketing seeds, and prevent negative spillover effects from seed systems in neighboring countries, such as the introduction of harmful seeds. The Seed Initiative of the Eastern and Central Africa Programme for Agricultural Policy Analysis (ECAPAPA) was undertaken to address the challenge of harmonizing seed policies and regulations in the region.



THE PILOT PHASE OF THE SEED INITIATIVE

The Seed Initiative began in 1999 with a pilot phase in three East African countries—Kenya, Tanzania, and Uganda. The project adopted ECAPAPA's basic working framework, the Policy Change Cycle, which consists of five main steps: policy agenda identification, policy data collection, policy data analysis, policy dialogue, and policy action.

Through literature and consultation with key stakeholders, the initiative noted five specific areas that needed to be addressed in the harmonization: (1) *variety evaluation, release, and registration*—procedures for evaluating and releasing new varieties were different in each country and often lengthy; (2) *seed certification*—standards were different for each country; (3) *phytosanitary regulations*—regulations, often based on nonscientific data, became trade barriers, and there were differences in requirements for importing or exporting; (4) *plant variety protection*—of the three East African countries, only Kenya had legislation on plant variety protection (PVP), lack of which discourages breeders from developing new crop varieties; and (5) *seed laws and regulations*—some laws and regulations were restrictive and constrained participation of the private

seed industry in variety evaluation, release, and certification.

The next steps were policy data collection and analysis. A national resource person for each country was selected to undertake studies on national seed laws, policies, regulations, standards, and procedures. A regional resource person then synthesized the three country reports to identify areas that were potentially harmonizable. In a series of national and regional consultative workshops, a range of stakeholders came together to review the reports and to recommend ways to rationalize and harmonize seed policies and regulations. These meetings led to agreements on laws that could be harmonized in each of the three countries to ease movement and trade of seed, at the same time ensuring adequate safeguards to avoid spread of diseases and pests through seed trade.

At one regional workshop, ECAPAPA facilitated the creation of the Seed Regional Working Group to oversee completion of the process of harmonizing regulations and procedures and to improve and strengthen cooperation in the seed sector in the region.

THE BENEFITS OF HARMONIZING

Before the Seed Initiative, breeders in the three countries entered materials for evaluation at the national level in each country before official approval for listing in the seed certification schedule. In addition, commercial seed producers conducted evaluations at different stages of the variety development cycle. There was limited and uneven participation of private seed companies in national seed evaluation trials. Agreement on a common seed-tagging system did not exist in the region. And only Kenya had legislation on plant variety protection.

The harmonization process has a number of achievements so far. It has streamlined variety evaluation, release, and registration processes, with the result that more private seed companies have been registered and more varieties have been released in all three countries. The testing period for new varieties has been shortened from three years to one season, and the number of variety release committees has been reduced from three to two.

This initiative set in motion certification standards for 10 crops beginning in 2000. As a result, Kenya is reviewing its seed regulations, Uganda adopted a Seed Statute in 2003, and Tanzania adopted a Seeds Act in 2004.

The number of phytosanitary restrictions on 10 selected crops has been reduced from 33 to only 3 pests. The harmonization process has also raised awareness in the three countries of the importance of sharing phytosanitary information,

leading to compulsory notification of new pests, as well as the need for a pest list for the region. And it has reduced the time it takes to obtain a phytosanitary certificate from one week to one day in Kenya and from two weeks to two days in Uganda.

The focus on harmonization resulted in a PVP Act of 2003 in Tanzania, with PVP offices in place in 2004, and a Draft PVP Bill for Uganda, now with Uganda's parliamentary committee.

In addition, as a result of the streamlining of export and import documentation, seed volumes traded within the three countries have increased. Since the increase could have resulted from several other factors, it is important to conduct a survey of seed traders to establish the source of the increased import and export volumes.

Finally, intangible benefits such as lasting partnerships have resulted. The initiative created fora for the public and private sectors to meet as equal partners to develop the seed sector. Moreover, the project now links regional seed subsectors with global seed structures. The initiative is also creating pressure for seed policy change elsewhere in the region.

The second-tier (Burundi, Eritrea, Ethiopia, Rwanda, and Sudan) and third-tier countries (the Democratic Republic of Congo and Madagascar) have largely embraced the agreements of the pilot-phase countries, offering promise that harmonization of the seed sector for the whole region will soon be a reality.

CONCLUSION

The region of Eastern and Central Africa has made remarkable progress in rationalizing and harmonizing seed policies and regulations. Translating agreements into practice, particularly through legislation, involved a number of participatory stakeholder meetings and coordination. The ECAPAPA network coordinated this effort and contributed to significant changes

in the seed legislation in Kenya, Tanzania, and Uganda. Linking these efforts with the international seed system and responding to emerging issues, such as genetically modified organisms, remain challenges. But the Seed Initiative has highlighted the existence of great political will, an enabling political environment, and extensive human and financial support for this effort.

This brief is based on:

Isaac Minde. 2004. *Harmonizing Seed Policies and Regulations in Eastern Africa: Experiences and Lessons Learned*. Entebbe, Uganda: Eastern and Central Africa Programme for Agricultural Policy Analysis (ECAPAPA).

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ETHIOPIA

GROWTH OPTIONS AND POVERTY REDUCTION

Xinshen Diao and Alejandro Nin Pratt, with Madhur Gautam, James Keough, Jordan Chamberlin, Liangzhi You, Detlev Puetz, Danielle Resnick, and Bingxin Yu

With a per capita income of only about 20 percent of the African average, Ethiopia is one of the world's poorest countries. More than 85 percent of the country's population lives in rural areas, where agriculture is the main economic activity and where the poverty ratio is particularly high. In addition, stagnant agricultural growth, together with unpredicted droughts, has resulted in persistent food crises and food insecurity. Hence, any strategy for slashing Ethiopia's poverty and hunger must focus on generating rapid and sustainable growth in the agricultural sector.

To identify which kinds of investments have the greatest impact on agricultural growth, a deeper understanding of the linkages between agriculture, economic growth, and poverty reduction is needed. This brief is based on a spatially disaggregated, economywide model that enables analysis of growth and poverty reduction linkages at national and regional levels from 2004 to 2015. The analysis considers the results for growth and poverty reduction of continuing with business as usual and of focusing on growth in four agricultural subsectors—staple crops, livestock, traditional exportables (coffee), and nontraditional exportables (selected fruits and vegetables, cotton, chat, sesame seed, sugar, and other horticultural products). The results of the model analysis reveal a number of conclusions for agricultural investment.



GROWTH IN STAPLES IS THE PRIORITY FOR POVERTY REDUCTION

Growth in staple crops makes a greater contribution to poverty reduction than any other agricultural or nonagricultural sector modeled. A scenario for staple crop growth indicates the capacity for 3.4 percent growth per year from 2004 to 2015. When one takes into account other economic linkages, this scenario results in gross domestic product (GDP) growth of 3.9 percent per year and agricultural GDP (AgGDP) growth of 3.5 percent per year. In the model, growth in staple crops causes the rural poverty rate to fall to 37.7 percent—an additional 10 percentage points of poverty reduction for the same year under the business-as-usual scenario, in which growth follows its current trends, and 8 percentage points below the 2003 rural poverty rate.

Why does growth in staple crops have such a significant effect? Cereals and other staple crops are the most important

income source for the majority of small farmers. Moreover, the world in which Ethiopian farmers operate is unlikely to change in the next 10 years, and increased domestic supply of staple crops will continue to be the most important source of food energy for both rural and urban poor consumers. With improved access to regional or world markets, Ethiopian farmers could export wheat to its East African neighbors like Kenya, for Ethiopia is the largest wheat producer in the region and Kenya is a wheat importer. Better market access and improved production conditions, such as irrigation, will also give farmers more opportunities to diversify. Many subsistence crops, like oilseeds and pulses, that are grown extensively among poor farmers can become marketable commodities, and this shift would further increase poor farmers' cash income.

LIVESTOCK GROWTH NEEDS TO BE COMBINED WITH STAPLE CROP GROWTH TO REDUCE POVERTY

The livestock growth scenario assumes annual productivity growth of 7.6 percent and results in GDP and AgGDP growth

rates similar to those modeled for staple crops. Nevertheless, under the simulations, livestock sector growth has a smaller

effect on poverty, which falls to 39.7 percent in 2015 driven by livestock sector growth, compared with 36.7 percent driven by staple crop sector growth. A key factor in this result is the smaller share of poor farmer income derived from the livestock subsector. Moreover, both the rural and urban poor consume far fewer livestock products. Consequently, poor consumers in both rural and urban areas benefit less from the lower prices of livestock products that increased production induces.

GROWTH IN EXPORT CROPS PLAYS A LIMITED ROLE IN POVERTY REDUCTION

In the two export growth scenarios, output of both traditional and nontraditional exportables is assumed to grow by 13 percent. Yet the impact of this growth on poverty is small, reducing the poverty rate only 4.2 percentage points below baseline levels to 40.2 percent.

A majority of poor farmers are often unable to adopt the necessary technologies without significant extension support, and the initial investments required for such commercial production are also prohibitive. In addition, increased agricultural

A combination of growth in both staple crops and livestock has a greater effect on poverty reduction in rural areas. With this combination, simulation results indicate a drop in rural poverty from 45.8 percent in 2003 to 33 percent in 2015. The linkage effect is particularly strong in the food-deficit areas, where the poverty rate falls from its high 2003 level of 60.5 percent to 49.6 percent in 2015.

export production, by definition, provides little direct benefit to poor consumers in rural and urban areas, since such commodities are not in poor consumers' consumption basket. Promoting growth in this subsector, however, can indirectly benefit poor people by creating more employment opportunities as a result of economic growth. Given that the most important constraint to growth in agricultural exportables is lack of market access, there is a strong need for reduced market transaction costs and greater investment in transportation.

INVESTING IN MARKET MATTERS FOR HALVING POVERTY

Seventy percent of Ethiopian farmers are reportedly more than half a day's walk away from an all-weather road. The combination of poor market access and high transportation costs significantly increases the gap between consumer and producer prices, which ultimately lowers the prices received by affected farmers. According to the simulation, when growth in the agricultural sector is combined with improved marketing margins resulting from improved infrastructure, GDP growth increases to 5.8 percent per year, and AgGDP growth increases

to 5.4 percent per year. The poverty rate under this scenario falls significantly, from about 46 percent in 2003 to about 24 percent in 2015. When agricultural growth is augmented by reduced market costs and an additional 1 percent annual growth in nonagriculture, simulation results show that growth in both GDP and AgGDP could reach about 6 percent per year, enabling the national poverty rate to decline to 23 percent in 2015, about half of the 2003 poverty rate.

CONCLUSION

Ethiopia faces dire challenges in alleviating poverty, let alone in meeting the Millennium Development Goal of halving the incidence of poverty by 2015 compared with 2000 levels. Agriculture has the potential to play a central role in decreasing

poverty and increasing growth in Ethiopia, but agricultural growth will require concurrent investments in roads and other market conditions.

This brief is based on:

X. Diao and A. Nin Pratt, with M. Gautam, J. Keough, J. Chamberlin, L. You, D. Puetz, D. Resnick, and B. Yu, . 2005. *Growth Options and Poverty Reduction in Ethiopia: A Spatial, Economywide Model Analysis for 2004–15*. DSGD Discussion Paper No. 20. Washington, D.C.: IFPRI.

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ETHIOPIA

LIVELIHOODS, GROWTH, AND MARKETS

Stefan Dercon and John Hoddinott

Development theory and practice have often treated rural and urban spaces as separate environments with distinct growth and development trajectories. A growing appreciation for the myriad links between rural and urban areas has spurred efforts to better understand and support their connections. Yet the importance of market towns to rural livelihoods remains sorely underresearched. Knowing more about the nature of links of rural households to local market towns and cities may be particularly useful for guiding regional development policies and poverty-reduction strategies.



IMPORTANCE OF RURAL LINKS TO URBAN AREAS

Links to local and regional urban centers—here meaning mostly towns and small- and medium-size cities, as opposed to large cities and metropolitan areas—convey numerous benefits to rural localities. These benefits include a larger market for agricultural and nonagricultural goods produced by rural households; improved access to the inputs needed for production of

these goods and to a wider variety of commodities; additional opportunities for employment; the ability to diversify income sources and thus reduce income variability; and improved access to health care, education, and the legal system.

THE STUDY OF 15 ETHIOPIAN VILLAGES

How significant are urban centers, particularly market towns, to the economic activities of rural households? How does better access to these centers affect household economic activities? Do better connections to these locales make rural households better off?

To explore these questions, this brief reports on an analysis of longitudinal data from the Ethiopia Rural Household Survey (ERHS) from 15 Peasant Associations (PAs). These PAs usually have a primary school, but other amenities are only rudimentary. On the other hand, the local market towns and cities usually have electricity, telephone service, and a post office. They are one-half to 20 kilometers away and range in size from a few thousand to about 60,000 people.

Data collection began in 1989 in six areas of rural Ethiopia but expanded in a subsequent round of data collection in 1994 to encompass nine more PAs. This expansion allowed for better representation of the diversity of farming systems in the

country. The 1994 survey round comprised 1,477 households; the sample was updated in later studies in 1995, 1997, 1999, and 2004. Population shares within the sample were broadly consistent with the population shares in the three main sedentary farming systems—the plough-based cereal-farming systems of the northern and central highlands; mixed plough/hoe cereal-farming systems found in the central and eastern regions; and farming systems based around enset, a root crop grown in southern parts of Ethiopia.

Descriptive statistics detailed location of purchases and sales, disaggregated by distance to the local market towns and by road access. Regression analysis was then used to evaluate the extent and location of the various economic activities undertaken by rural households—such as the selling of livestock or crops or the purchase of fertilizer—as affected by factors such as the relative distance of the home village from the local market town, the availability and quality of transport,

and the condition of local roads. Regression methods allowed for control of the effects of confounding factors such as the possibility that higher levels of economic activity were actually

correlated with higher agricultural potential of the area rather than only better access.

RESULTS OF THE STUDY

Three core findings emerge from the study: first, local market towns and cities are extremely important to the economic activities of rural households. In fact, these localities are largely the only urban locations where rural households undertake economic activities. Apart from remittances, rural households have few direct links with more distant urban centers or the capital city. Rural households purchase about half their inputs for agricultural production in these local urban centers, and more than half of other household items, such as batteries, matches, and food. Although the proportion of crops sold in these local market towns and cities varies widely (from about 25 percent of eucalyptus to about 60 percent of wheat), rural households sell about 75 percent of their livestock there. These towns and cities are also the primary locations for the

sale of artisanal products, particularly those produced by women. Few households, however, make purchases or sales in more distant regional centers or in Addis Ababa.

Second, proximity to a market center affects the extent of economic activity, even after controlling for other factors. The closer the village is to a market town, for instance, the more likely rural households are to purchase inputs or sell a variety of products there.

Third, improved access to market towns and cities has a positive effect on welfare. Improving the presence and quality of roads and widening transport options increase consumption. Communities with better roads have higher growth rates than others. More remote communities have a tendency to grow somewhat slower, beyond any effects related to infrastructure.

POLICY AND PROGRAM CHALLENGES

Development debates are predicated on the separateness of urban and rural spaces. Although one should be cautious in extrapolating the results from this study, given the relatively few villages it covers, the results suggest that local market towns and cities play a key role in providing space for the economic activities of rural households. Their role in connecting urban and rural areas suggests that drawing too strong a divide between “rural” and “urban” localities and envisioning that most economic activities take place within those

respective rural and urban areas is misleading.

The study shows that market towns and cities are an important source of demand for products produced in rural areas, and rural residents are a source of demand for goods sold in urban areas. Improving the presence of roads and their quality and the range of transport options available will make important contributions toward further bringing these spaces together and improving rural welfare.

This brief is based on:

Dercon, Stefan, and John Hoddinott. 2005. “Livelihoods, Growth, and Links to Market Towns in 15 Ethiopian Villages.” FCND Discussion Paper No. 194. Washington, D.C.: IFPRI.

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KENYA

PROPERTY RIGHTS

Esther Mwangi

In the late 1980s the Maasai pastoralists in Kajiado District of southwestern Kenya voted for the subdivision of their collectively held group ranches into individual, titled parcels. Viewed against the backdrop of Maasai pastoral livelihoods that have evolved in conditions of climatic variability and resource heterogeneity, the decision to subdivide is puzzling.

Rainfall over most of Kajiado District is low and variably distributed across space and time. The mobility of Maasai herds allows for maximum and equitable exploitation of patchily distributed water and pasture. Subdivision of collective holdings may severely impede mobility, and reduced mobility may in turn increase vulnerability to drought and threaten livestock viability. No doubt the Maasai are aware of this. So why have they pursued the subdivision of group ranches?

A framework for understanding the evolution of property rights suggests that under certain conditions individuals and groups may perceive the benefits anticipated from an individualized property rights structure as outweighing the costs of transforming the old one and of maintaining the new structure. Such conditions may include changes in factor or product prices, demographic pressures, perceptions of scarcity, and common-pool resource losses. Did the actions of the Maasai conform to property rights theory?

THE TRANSFORMATION OF PROPERTY RIGHTS IN KAJIADO DISTRICT

Group ranches were early experiments with land tenure reforms in Kenya's rangelands in Maasai territory in the late 1960s and 1970s. A group ranch is land that has been demarcated and legally allocated to a group such as a tribe, a clan, section, family, or other group of persons. It is now widely accepted that group ranches failed to meet their intended objectives. Barely 10 years after their creation there were demands for their dissolution and subsequent division into individual, titled units for distribution among registered members.

Several factors drove individuals' preferences for subdivision. One fundamental factor was members' concern about increasing human numbers in the context of a fixed, non-expanding land resource base.

Another factor was the success of other individual ranches. In the early 1960s to early 1970s, a number of individual ranches were established as part of a broader plan to commercialize land and livestock production in Maasailand. Because the individual ranches were to be used as a model for the rest of the Maasai to emulate, conditions were created to ensure their success, including provision of low-interest credit, construction of infrastructure, and support from livestock extension officers. With time, group ranch members began to

see individual ranching as a reasonable and viable alternative.

Group ranch members did, however, resent the individual ranchers' tendency to graze their livestock in group ranch pastures during the wet season and retreat into their fenced and exclusive ranches in the dry season. Individual ranchers were able to graze in group ranches primarily by exploiting their friendships with group ranch management committees or relationships with ordinary members.

An additional factor concerned grazing interactions inside the group ranches. Although the group ranches contained both livestock-poor and livestock-rich individuals, all group members grazed on the same pastures. Livestock-poor individuals felt they were subsidizing the livestock enterprise of the rich, with no apparent gain to themselves.

Collective decisionmaking in the group ranches also posed challenges. The group ranch committee members were facing endless frustration over several issues, such as enforcing livestock quotas. Without an agreement on a limit to herd size, the group ranch faced a tragedy of the commons.

The history of Maasailand has been one of dispossession: first, for the settlement of European immigrants, second, for the creation of wildlife parks and reserves, and third, for the



settlement of migrants from densely populated districts and more recently from among the Maasai themselves. Faced with this credible threat of land loss, the Maasai have responded over the years by seeking more exclusive rights, first for the collective and now for the individual. They thus view group ranch subdivision as a way to secure the individual's land rights against appropriation.

Yet this list of motivating factors obscures the struggles, bargains, and controversies between various age and gender groups that defined the subdivision process.

The Elders. In two group ranches, the most senior elders were strongly opposed to subdivision. To them, subdivision would reduce the amount of land available for livestock, leading to a reduction in the number of livestock and ultimately resulting in poverty. Poverty would motivate individuals to sell parts of their land in their effort to survive. Such sales, if to outsiders, would result in the loss of Maasai land to non-Maasai.

By contrast the senior elders in two other group ranches strongly supported the subdivision of their group ranches. Members of their age set owned the numerous individual ranches surrounding the group ranches, and most regretted their earlier failure to take individual ranches when they were up for grabs.

Rich and Poor Livestock Herders. Rich livestock herders initially disfavored subdivision. Their large herds would not be sustained under smaller-sized parcels. Free grazing of their herds within the group ranch made them the disproportionate beneficiaries of the group ranching system.

The poor on the other hand favored subdividing primarily because restricted grazing within the confines of their individ-

ual parcels was expected to enable them to better manage their small herds. Subdivision would also open up new income-generating opportunities for them, such as leasing excess pasture land, cultivating land, and selling charcoal, or even a part of their land.

The Women. Since women were not registered as group ranch members, most did not have decisionmaking powers. Widows, however, as the executors of their deceased husbands' shares in the group ranch, favored subdivision because it would allow them to become landowners through the inheritance of their deceased husbands' shares in the group ranch and assure their sons' futures.

Many married women favored subdivision on several grounds: inheritance for children, land ownership, and freedom to conduct independent decisions. The few that were wary of subdivision cited restricted access to grazing and a breakdown of shared life patterns as constraints.

The Youth. When the process of subdivision began, several groups of youths were eligible for registration as members in the group ranches, and these youths favored the idea of subdivision for reasons of individual progress and development and to attain some measure of independence from their fathers. Yet, even though the youths favored subdivision, they were excluded from membership at the time of subdivision across all group ranches on the basis that increasing the number of members would reduce the size of parcels that each would ultimately receive. The youths challenged their exclusion, seeking the intervention of elders, the local administration, government officials, and even Maasai politicians of national stature. They did not succeed.

CONCLUSION

The reasons why individuals supported group ranch subdivision—perceptions of land scarcity, failures of collective decisionmaking, and the promise of new income opportunities—are consistent with predictions made by property rights theorists. Privatization and individualization of collective tenure were also seen as reasonable responses to declining land tenure security over the years.

Studies show, however, that subdivision of land in semi-arid or arid environments is neither efficient nor sustainable. The Maasai experience thus points to the need to assure the security of collective tenures in such environments. In addition, the exclusion of women and youths from decisionmaking highlights the need for transparent and accountable oversight in decisionmaking processes.

This brief is based on:

E. Mwangi. 2005. "The Transformation of Property Rights in Kenya's Maasailand: Triggers and Motivations." CAPRI Working Paper No. 35. Washington, D.C.: IFPRI. www.capri.cgiar.org/pdf/capriwp35.pdf.

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UGANDA & TANZANIA

PRO-POOR PUBLIC INVESTMENT

Shenggen Fan, David Nyange, and Xiaobo Zhang

As policymakers decide how to allocate public spending to achieve higher growth and poverty reduction, they need a clear understanding of how public investments translate into development outcomes. This brief, based on two IFPRI studies of public spending in Tanzania and Uganda, analyzes public investments to help determine which categories of spending can do the most to reduce poverty and stimulate growth, especially in rural areas.

EXPERIENCE AND LESSONS FROM TANZANIA

In the mid-1980s Tanzania began to undertake macroeconomic reforms in line with structural adjustment programs. These reforms included rationalization of government spending on the public sector and more conservative fiscal policies, including downsizing of the civil service and removal of some government subsidies to agriculture and other sectors.

As a result of the reforms, Tanzania's economic indicators improved significantly. Inflation fell from 30 percent in 1995 to 4.4 percent in 2004; foreign exchange reserves rose from the equivalent of six weeks of merchandise imports in 1995 to 18 weeks in 2002; the official exchange rate became more stable; and the growth of gross domestic product (GDP) jumped from 2.6 percent in 1995 to 5.2 percent in 2004.

Despite these achievements, the decline in poverty has been disappointing, particularly in rural areas. During the 1990s, poverty declined only slightly from 39 to 36 percent. Only Dar es Salaam experienced a statistically significant decline in poverty, from 28 percent to 17 percent. Today, Tanzania is among the world's least-developed countries, with a 2003 per capita GDP of less than US\$600, measured in purchasing power parity (PPP). Agriculture contributes about 45 percent of GDP and employs 80 percent of the population.

An analysis of public spending and its effects, based on household survey data, shows that additional investments in rural education can have very favorable impacts on poverty, raising about 43 poor people above the poverty line per million shillings spent. Education investments also lead to sizable

increases in per capita income per shilling spent, with an average benefit-cost ratio of 9.

These impacts are strong and statistically significant in all regions of the country. Therefore, increased investments in education should be a priority in all regions.

Investments in agricultural research and extension also have a large impact on rural poverty, raising about 40 persons out of poverty per million shillings spent, and have the largest impact on incomes, with an average benefit-cost ratio of about 12. In this case regional targeting is important because, although the impacts are substantial in the central and southern regions, they are much less attractive in some other parts of the country.

Rural road investments also have a large impact on per capita incomes, with an average benefit-cost ratio of 9.13. Their impact on poverty per shilling spent is about half that of investments in education; each million shillings spent raises about 27 poor people out of poverty. The effects of roads on poverty and growth are most favorable in the southern highlands and central and western zones and least favorable in the northern part of the country. This result implies that regional targeting is appropriate.



EXPERIENCE AND LESSONS FROM UGANDA

Since the mid- to late 1980s, when Uganda emerged from a period of political turmoil and economic mismanagement, the country has made great strides toward economic growth and poverty reduction. Annual GDP growth climbed from only 3 percent during the 1980s to 6.9 percent in the 1990s. As a result, the share of the population below the poverty line fell from 56 percent in 1992 to 35 percent in 1999—but this success was not equally distributed among regions or between rural and urban areas. The incidence of poverty in rural areas was 39 percent, whereas it was only 10 percent in urban areas in 1999/2000. Ninety-five percent of the poor in Uganda are concentrated in rural areas, in particular in the northern region, and agriculture is their primary source of livelihood.

According to our estimates, different types of spending varied greatly in their marginal effects on agricultural production and poverty reduction in different regions.

Government spending on agricultural research and extension had the largest impact on poverty reduction, as well as the largest measured returns to growth in agricultural production. Growth in agriculture is still much needed to meet the food needs of an increasing population.

Government spending on rural roads also had a substantial marginal impact on rural poverty reduction. By improving agricultural productivity, low-grade roads such as feeder roads had a larger impact than did high-grade roads such as murrum and tarmac roads.

Education's effects rank after those of agricultural research and extension and feeder roads. Education appeared to reduce poverty by leading to growth in agricultural productivity, more nonfarm employment, and increased rural wages.

Government spending on health did not show a large impact on agricultural productivity growth or rural poverty reduction, in part because large investments had already been made in the fight against HIV/AIDS, and further investment may yield lower returns.

Additional investments in the relatively neglected northern region contribute most to reducing poverty because this is where most of Uganda's poor people are now concentrated. Improved security, however, is a necessary condition for these investments to have any impact. In terms of increased agricultural productivity, most types of investment have the highest returns in the western region.

CONCLUSION

The two studies suggest that the potential gains from real-locating government resources are enormous. Public funds, directed to the appropriate investments and regions and used efficiently, can do much to help achieve national economic growth and poverty reduction goals in Tanzania and Uganda. Returns to investments vary greatly, however, among different types and across regions, even within the same country. Investments in agriculture, education, and infrastructure, particularly low-grade and low-cost feeder

roads, generally have a much larger impact on both agricultural growth and poverty reduction than do other types of investments. Although it is not clear-cut that there is any statistical difference in the returns to investment between favored and less-favored areas, regional targeting is crucial to maximize both growth and poverty reduction potentials. Further research is needed to understand why the returns on investment vary so much across sectors and regions in the two countries.

This brief is based on:

S. Fan, D. Nyange, and N. Rao. 2005. "Public Investment and Poverty Reduction in Tanzania: Evidence from Household Survey Data." DSGD Discussion Paper No. 18. Washington, D.C.: IFPRI.

S. Fan, X. Zhang, and N. Rao, 2004. "Public Expenditure, Growth, and Poverty Reduction in Rural Uganda." DSGD Discussion Paper No. 4. Washington, D.C.: IFPRI.

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UGANDA

INCOME STRATEGIES AND LAND MANAGEMENT

Ephraim Nkonya, John Pender, Pamela Jagger, Dick Sserunkuuma, Crammer Kaizzi, and Henry Ssali

The government of Uganda, with help from its development partners, is designing and implementing policies and strategies to address poverty, land degradation, and declining agricultural productivity. Land degradation, especially soil erosion and depletion of soil nutrients, is widespread in Uganda and contributes to declining productivity, which in turn increases poverty.

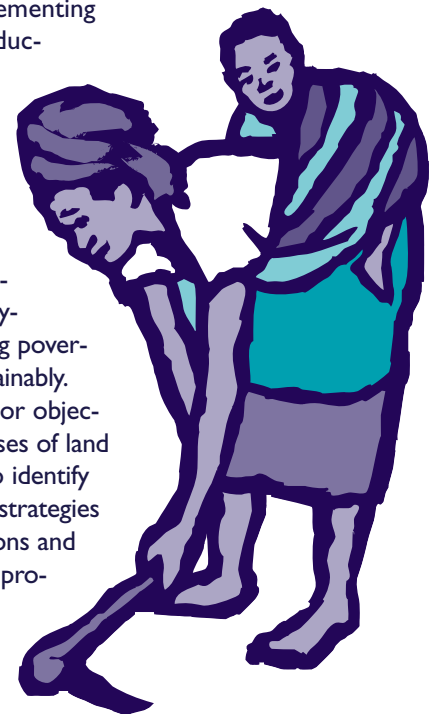
OBJECTIVES OF THE STUDY

One of the challenges that the government faces in confronting these problems is lack of information to empirically support policy recommendations. To address this information gap, the authors of this research report analyze the policy-relevant determinants of households' income strategies and land management practices in Uganda and their impacts on agricultural production, household income, and land degradation. To obtain basic data, they surveyed 107 communities and 451 households and conducted a plot-level survey to investigate the land management and productivity of each plot. As indicators of sustainability of land management, soil nutrient flows and balances were estimated for a sub-sample of 58 households in eastern Uganda, and the determinants of these flows and balances were also investigated.

The contribution of this research to the literature is its analysis of complex relationships among different policy and program interventions, households' livelihood strategies and land management decisions, and their impacts on agricultural produc-

tivity, poverty, and land degradation. The study offers policy-related insights for addressing poverty and land degradation sustainably.

The report has four major objectives: (1) to examine the causes of land degradation in Uganda; (2) to identify the determinants of income strategies and land management decisions and their impacts on agricultural productivity, soil erosion, and household income; (3) to assess the trade-offs and complementarities among these different objectives; and (4) to analyze the soil nutrient depletion in eastern Uganda to determine the factors that influence it.



SUSTAINABLE LAND MANAGEMENT AND POVERTY REDUCTION STRATEGIES

The communities and households surveyed vary widely in agro-ecological potential, access to markets and infrastructure, population density, presence of programs and organizations, education, household capital, and other factors. Although some of the results were expected, others challenged common assumptions.

Access to markets and roads did not have as much impact on income strategy and crop choice, land management, labor intensity, value of crop production, or soil erosion as expected, but it did contribute to depletion of soil nutrients, at least in the near term.

Where population was dense, farms tended to be smaller and farmed more intensively and productively. But, higher population density also contributed to soil erosion, contrary to the "more people, less erosion" hypothesis.

Income strategies also had a strong impact on the value of crop production and the level of income: higher value was associated with livestock production, nonfarm activities (because farmers used nonfarm earnings to buy agricultural inputs), and greater specialization in higher-value crops such as bananas. However, differences in household income levels for

households pursuing different income strategies were statistically insignificant, except for livestock producers, who earned significantly more than crop producers. Income strategies also affected land degradation: for example, households more focused on nonfarm activities or livestock production had lower rates of soil nutrient depletion.

Participation in agricultural extension and programs sponsored by NGOs had mixed results across locations, which seemed to be the result of differences in the technologies promoted in each location. Agricultural extension was associated with higher productivity, but also with more erosion in the highlands and more soil nutrient depletion due to promotion of yield increasing varieties without adequate adoption of soil-conservation or fertility-replenishing practices. By contrast, NGO programs focusing on agriculture and environmental issues helped to reduce land degradation but had less favorable near-term impacts on production, especially outside of the highlands.

POLICY IMPLICATIONS

These results suggest that the most promising strategies for reducing rural poverty are improvement in farmers' education and development of livestock production. Strategies to help increase the value of crop production include agricultural extension and training programs, development of banana and livestock production, specialization in cash crops, increased nonfarm activities, and improved access of small farmers to land. Reducing land degradation is more likely to be achieved by supporting NGOs that focus on agriculture and the environment, promoting nonfarm activities, and controlling population growth or facilitating emigration from the highlands, thus reducing soil erosion and nutrient depletion.

In efforts to reduce poverty and increase agricultural production sustainably, it is important to realize that many strategies involve trade-offs among these objectives and that their impacts are often context specific. For example, improved education leads to higher incomes and better soil nutrient balances, but it may also reduce crop production and increase

Access to credit did not appear to affect income or purchase of inputs such as fertilizer, but it increased the intensity of labor.

Land tenure and land title affected crop choice and land management practices somewhat, but had no significant impact on the value of crops produced, soil erosion, or household income.

Education significantly influenced households' income strategies, land management practices, and labor use in crop production. As expected, higher education contributed to significantly higher household income and reduced soil nutrient depletion, but it also led to less labor intensity in crop production.

Female-headed households had higher incomes than male-headed households, and they depended more on nonfarm activities. This suggests that women are more likely to be employed off the farm and that their labor productivity is higher than that of men, which supports a common view that men are underemployed relative to women in rural Uganda.

soil erosion, as a result of reduced labor intensity in farming. Agricultural extension and training increases productivity but also contributes to increased soil erosion and soil nutrient depletion by promoting increased production of annual crops without sufficient promotion of soil-fertility improvements or soil- and water-conservation measures. Similarly, improvements in market access can help to increase fertilizer adoption and reduce use of slash and burn, but they also contribute to soil nutrient depletion.

In general, these results imply that there are few "win-win" opportunities to simultaneously increase production and household income and to reduce land degradation. Different instruments are needed to achieve different objectives, and trade-offs among these objectives must be expected. Just as no single solution exists to improve all outcomes simultaneously, different approaches are needed in different locations. There is no "one-size-fits-all" solution to the complex problems of small farmers in the diverse circumstances of Uganda.

This brief is the same as:

E. Nkonya, J. Pender, P. Jagger, D. Sserunkuuma, C. Kaizzi, and H. Ssali. 2005. *Strategies for sustainable land management and poverty reduction in Uganda*. Research Report Abstract No. 133. Washington, D.C.: IFPRI. www.ifpri.org/pubs/abstract/133/ab133.pdf

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