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Seed, Fertilizer, and Agricultural Extension in Ethiopia

Summary of ESSP II Working Paper 20, 'Seed, Fertilizer, and Agricultural Extension in Ethiopia'

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Decisionmakers in Ethiopia have pursued a range of policies and investments to boost agricultural production and productivity. An important tool has been to increase the availability of improved seed, chemical fertilizers, and extension services for small-scale, resource-poor farmers. While there is some evidence to suggest that the process has led to improvements in both agricultural output and yields, there is an urgent need for more substantial progress. A rethinking of approaches is required, one that reallocates the roles of the public and private sectors in the agricultural input sector.

In spite of nearly two decades of policies that placed high priority on boosting agricultural production and productivity, Ethiopia has yet to see payoffs in terms of higher and more stable cereal yields, lower consumer prices for food staples, and reduced dependence on food aid. The challenge is finding ways to strengthen smallholder access to inputs, technology, and information, and improving the incentives for their use and adoption. This brief attempts to synthesize Ethiopia's current input systems and extension services, identify challenges the country is facing through its efforts to strengthen these systems, and recommend policy solutions for the future.

Seed systems and markets

Improved seed adoption. The total quantity of improved seed supplied nationally has been increasing since 1996–97. But the adoption of improved varieties is very low (3 percent according to the Ethiopia Rural Smallholder Survey (ERSS) conducted in 2005) and only 4–5 percent of cropped area was under improved varieties in 2007–08 (CSA). These figures, however, obscure the extensive uptake of improved wheat and, to a lesser extent, improved maize, in Ethiopia.

Demand and supply. Estimates of market demand for improved seed in Ethiopia are based entirely on official projections. The responsibility of responding to these demand estimates lies primarily with the state-owned Ethiopian Seed Enterprise (ESE). Production and distribution of improved seed has been stagnant since about 2000. Demand has consistently fallen short of supply. In addition, shortcomings in seed quality and timeliness of delivery have been longstanding issues in Ethiopia.

Seed industry structure. The seed industry in Ethiopia involves a range of both public and private sectors. Following market reforms in the 1990s, seed production and distribution were opened to the private sector. The public sector, including the regional extension and input supply systems, accounts for 80% of total sales of improved seeds. In 2008, 11 firms were active in seed production, with most of them involved specifically in hybrid maize seed, though primarily as ESE subcontractors. Despite the lucrative potential of the hybrid maize seed market, approximately 60% of maize seed supply was still managed directly by the public sector, with an additional 10% of firms serving as sub-contractors to the public sector. Only 30% of maize seed supply is derived from firms operating independently from the public sector's seed production system.

Fertilizer markets

Fertilizer uptake. When measured in terms of quantity imported, fertilizer use in Ethiopia has increased from 250,000 tons in 1995 to 400,000 tons in 2008, a growth more rapid than the average for Sub-Saharan Africa over the same period. A significant portion of smallholders use fertilizer: 39 percent according to CSA and 32 percent according to the 2005 ERSS survey. Teff, wheat, and maize cultivation account for the majority of fertilizer use. However, smallholder usage of fertilizer and seed-fertilizer technology packages tend to vary dramatically between seasons, while data on application rates (kg/ha) often tell a variable and confusing story. For example, a study conducted by EEA/EEPRI (2006) notes that up to a third of the farmers covered by the Participatory Demonstration and Training Extension System (PADETES) dis-adopted the seed-fertilizer technology packages over time, likely due to the high cost of inputs, insufficient credit and credit rationing, lack of varieties appropriate to farmers' needs, and other factors.

Prices and profitability. The return to fertilizer use has been generally positive in recent years with a Value Cost Ratio around the threshold of 2, suggesting that fertilizer prices in Ethiopia are competitive. Nonetheless, the ability to provide the right type of input of good quality to farmers in a timely manner is equally important. The distribution system in Ethiopia is inflexible, providing only DAP and urea in 50 kg bags and often delivering fertilizer well past the time needed to optimize its use. Moreover, fertilizer distribution is closely tied to the state-run credit system which, while addressing the credit constraints facing many smallholders, also limits the space available for the emergence of private sector retailers.

Market structure. The Government of Ethiopia liberalized the fertilizer sector soon after the end of the Derg regime. Policy changes that liberalized fertilizer pricing and the removal of subsidies followed in 1997–98. The private sector's initial response to market liberalization was rapid. However, the independent private sector rapidly exited the fertilizer market within a few years. They were first replaced by "private" holding companies with strong ties to the government, and since 2007, fertilizer imports have been controlled by Agricultural Inputs Supply Enterprise (AISE) and cooperative unions. Trends are similar in the case of wholesalers: while the AISE had a market share of less than 50 percent during the mid and late 1990s, it had regained

the majority share by 2001. The decline was even more dramatic in the retail market: while private retailers held a majority share of the market in the early 1990s, the public sector and cooperative unions have become almost the sole distributors of fertilizer since 2000.

Agricultural extension services

In effect, agricultural extension services are what tie improved seed, chemical fertilizers, and credit together for the Ethiopian smallholder. Extensions services were first introduced in the 1950s. Since the 1980s, Ethiopia's extension system has followed a "training and visit system" that was introduced under the PADETES program. Over the last five years, the extension program—traditionally financed and provided almost entirely by the public sector, representing almost 2 percent of agricultural GDP in recent years—has increased the number of public extension staff almost three-fold to nearly 47,500 development agents (DA) in 2008, and in addition established Farmer Training Centers (FTCs).

However, real progress in terms of impact on productivity and poverty has been mixed. Although many farmers seem to have adopted the packages promoted by the extension system, up to a third of the farmers who have tried a package have discontinued its use. The expected impact of DAs and FTCs remains unclear due, in part, to the near absence of any rigorous impact evaluation. Part of the problem is that the success of the extension services has been traditionally measured in terms of numeric targets for physical input use, often at the cost of emphasizing the efficiency and profitability of input use. In addition, continued imposition of targets from above, and weak local capacity in extension management, have not yet permitted the emergence of a more dynamic, demand-driven system.

On the positive side, several reforms have been introduced to address these deficiencies. First, in an effort to get beyond a focus on cereals, new packages have been developed to support other crop and livestock enterprises, improve post-harvest technology adoption, and encourage natural resource management. Second, in recognition of the diversity of smallholder farming systems in Ethiopia more appropriate zone-specific packages have been deployed. Third, input distribution is being shifted away from extension services to cooperatives, thus freeing extension agents to provide more technical advice. And fourth, there are moves being made to strengthen and diversify the curriculum provided by the 25 Agricultural Technical and Vocational Education and Training colleges that are responsible for preparing development agents.

Policy implications

Policies to promote improved seed and fertilizer through national and regional, state-run input supply and extension systems initially generated some positive impacts in Ethiopia over the last two decades. But experience to date suggests that an increasing role of the state will not provide the intended growth stimulus to the agricultural sector. The current approach reduces the quality of input services to smallholders, incurs many hidden costs to the government, and generates significant risks to both smallholders and the government.

Public sector involvement in Ethiopia's agricultural sector will remain critical where smallholders have poor access to markets, weak purchasing power, and irregular access to market information. Public leadership in encouraging private investment in market-based systems remains necessary in Ethiopia where modern market institutions are still under development. Specifically, more consideration should be given to long-term policies designed to build a dynamic private sector to promote fertilizer, seed, credit, and market information systems. A greater degree of flexibility in how inputs and services are provided, and a greater degree of choice for smallholders, can open up new market and technological opportunities in the agricultural sector.

Several measures would facilitate the development of an efficient input marketing and rural financial system: (1) Policies to open the market (and pricing) for hybrid maize seed—this transition would have to be gradual; (2) Policies to liberalize the fertilizer market—this includes liberalizing collateral requirements for fertilizer imports, reducing the credit guarantee to 50 percent and gradually lowering it further until an eventual phase-out, opening the credit guarantee to other certified financial institutions, and liberalizing interest rates; (3) Deep reforms in the extension system—these need to extricate the system away from top-down, package approaches to a more dynamic, responsive, and competitive service provision; (4) Innovative programs should be continually explored—including price risk mitigation based on a combination of market and non-market management tools, scaling up weather insurance schemes, developing a comprehensive market information system to support the commodity exchange, and liberalization of the telecommunications sector to improve rural access to information and communications technologies; and (5) More resources should be invested in regular and methodical assessments of the impact of the extension and input supply system which will make it possible to evaluate where the disincentives, bottlenecks, and structural issues are in the system, and how they can be remedied.

Of course, these recommendations also recognize the necessity of continued public engagement in input markets and extension services. What is needed is a strategic and well sequenced effort over the medium term to carve out new space for private investment in providing goods and services for smallholders.

This research note is intended to promote discussion; it has not been formally peer reviewed but has been reviewed by at least one internal and/or external reviewer. The Ethiopia Strategy Support Program of the International Food Policy Research Institute (IFPRI) works closely with the government of Ethiopia, and other development partners to provide information relevant for the design and implementation of Ethiopia's agricultural and rural development strategies. For more information, see http://essp.ifpri.info/ or http://www.edri.org.et/.

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