

Encouraging economic growth in Ethiopia: Perspectives on agricultural input markets, agricultural extension and advisory services, and agricultural education and training

Briefing note prepared for the DFID funded study “Understanding the constraints to continued rapid growth in Ethiopia: the role of agriculture”.¹ The views expressed in this note are those of the author and are not necessarily representative of DFID.

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Introduction

This background paper intends to contribute to a wider study on how growth in Ethiopia’s agricultural sector can be encouraged in support of a long-run strategy for wider economic growth. The paper focuses specifically on priorities and challenges in agricultural input markets and systems (seed, fertilizer, and credit), agricultural extension and advisory services, and agricultural education and training.²

The paper begins by examining the main input needs of smallholder farmers for cereal intensification, the capacity of both state and markets to meet these needs, and the major constraints to meeting those needs. This is followed by several forward-looking scenarios that introduce options for improving the effectiveness of agricultural input, extension, and education systems to stimulate more rapid smallholder commercialization and agricultural growth.

Note that this paper does not cover several related topics. First, the paper does not specifically identify the main input needs of smallholders (types of inputs and packages, timings of delivery, etc.) to promote the intensification of cereals (wheat, maize, teff, sorghum and barley) and the commercialization of other crops (pulses, fruits, vegetables, and tree crops). This type of agronomic data is highly dependent on the type of crop, soil, moisture, and farming practices in question, and is available from other sources. Second, this paper does not examine the contribution of agricultural research to agricultural growth process, despite their obvious importance.

Third, this paper does not treat the issue of equitable growth. Although income in Ethiopia is known to be well distributed—a vast majority of the country’s population are equally poor by any standard—anecdotal evidence would suggest that this distribution is changing with recent growth trends that have encouraged the emergence of an elite class of wealth-holders—primarily urban

¹ Study coordinated by a team consisting of Stefan Dercon, Ruth Vargas Hill and Andrew Zeitlin.

² This paper draws mainly on the following references: Byerlee et al. (2007), Alemu et al. (2007), and Davis et al. (2007).

industrialists, but also some with closer ties to the rural areas. This would suggest that a study on encouraging economic growth should include a close examination of the distribution of growth along class, urban/rural, high/low potential areas, farm/pastoral livelihoods, and other lines. However, this is beyond the scope of the present paper.

Cereal Intensification Efforts

Beginning in the 1990s, the Government of Ethiopia (GoE) introduced a range of economic reforms that sought to boost agricultural production. A hallmark of this strategy was as the introduction of several large-scale programs designed to intensify cereal production through the use of improved seed, chemical fertilizers, and credit. The intensification campaign focused on cereals in the moisture-reliant highlands where 60 percent of the rural population lives and where the strategy had the best chance of success.

The most significant intensification program—the Participatory Demonstration and Training Extension System (PADETES)—was introduced in 1994/95 following a large-scale demonstration program led by Sasakawa Global 2000. Over a 10-year period, PADETES reached about 40 percent of the roughly 10 million farm households in Ethiopia. Data from millions of demonstrations carried out through PADETES (3.6 million in 1999 alone) indicated that the adoption of seed-fertilizer technologies could more than double cereal yields (Table 1) and would be profitable to farmers in moisture-reliant areas (Howard et al., 2003).

A key feature of PADETES (and its predecessors such as the National Agricultural Extension Intervention Program (NAEIP)) was the primary role played by the state. Improved seed was developed, multiplied, and distributed by public organizations and agencies, fertilizer was distributed (primarily) through public channels, credit was disbursed through state-guaranteed credit institutions, and extension services were provided by woreda (district) bureaus of agriculture.

A decade after PADETES, and in the midst of another state-led cereal intensification program, the Ethiopian economy, and the policies meant to steer the economy to higher growth, has changed. While the extent and depth of this change is a matter of some debate, there are concerns that these programs are not consistently generating the desired impacts (see, e.g., Byerlee et al, 2007; DSA, 2006; EEA/EEPRI, 2006). Yet agricultural input markets, extension services, and agricultural education and training have changed relatively little in spite of this. The state continues to play a dominant role, and the effectiveness of its interventions is now coming under increasing scrutiny. These realities are discussed below for each major component of the GoE's cereal intensification program—seed, fertilizer, credit, extension, and education.

Seed Production and Distribution

Ethiopia's cereal intensification programs hinge on the distribution of improved seeds, primarily for crops such as maize and wheat. But adoption of improved seed in Ethiopia has generally been disappointing. Official estimates suggest that while the total quantity of improved seed supplied nationally increased during the PADETES period, farmer use of purchased seed in 2005 covered an average of only 5 percent of cropped area, with a high of 16 percent for maize. Most farmers still rely on farmer-to-farmer exchanges or saved seed, even for improved varieties (Belay, 2004) (Table 2).

After an initial boost, production and distribution of improved seed has been stagnant since about 2000. At about this same time, the supply of improved seed channeled through the formal system began to fall short of official estimates of demand (e.g., a 73 percent shortfall in 2004/05). Limited production capacity at the state-owned Ethiopian Seed Enterprise (ESE), combined with insufficient provision of basic seed from the research system, contributed much to these shortfalls. These problems are further compounded by shortcomings in seed quality and timeliness of delivery (see Sahlu and Kahsay, 2002; DSA, 2006; EEA/EEPRI, 2006). This is true whether seed is distributed through regional extension programs or, as is increasingly the case, through cooperative unions and their member cooperatives.³

Even despite policies favorable to private sector development (including a plant breeder's act that came into effect in 2006), private investment in Ethiopia's seed market has been severely constrained by several entry barriers. First, private seed companies face high costs associated with building distribution networks that must compete with the state's own distribution system that ties seed with fertilizer and credit (World Bank 2006b). Second, private companies must contend with the similarly high costs of navigating the regulatory system, accessing financing from the formal banking sector, and meeting stringent collateral requirements. Third, private investment has also been thwarted by relatively low nominal prices for seed sold by ESE, despite the possibility of bringing these prices into closer alignment with international benchmarks that price hybrid seed at about a 10:1 ratio over the grain price (versus the 5:1 used in Ethiopia).

In spite these constraints, private investment in Ethiopia's seed market is slowly emerging, and there are indications that the potential for much larger investment—on the scale of Kenya, Zambia or other eastern and southern African countries—exists (Table 3). This is particularly true for hybrid maize, the biological properties of which make it attractive to private investment, and where experiences from eastern and southern Africa suggest that it is a potentially lucrative product.

Several private investors, including Pioneer HI-Bred International and a handful of domestic companies, are demonstrating this with their own hybrid maize production lines and distribution systems that are highly competitive with the ESE. Production cost data even suggest that at least one private company can produce hybrid maize seed for 32% of ESE's costs (Alemu et al., 2007). However, in 2004, their share of the market represented less than 26 percent of the entire hybrid maize seed market, and most of their customers were themselves public entities. In reality, only eight firms are actively engaged in the seed market, primarily as sub-contractors to ESE (Alemu et al., 2007). Thus, ESE still represents the main player in the market as the key purchaser of hybrid maize seed from private seed producers, and as the key supplier to regional extension programs, cooperatives, international aid agencies, state farms, and commercial farms.

Fertilizer Importation, Wholesaling, and Retailing

Interestingly, Ethiopia's experiences in the fertilizer sector provide some lessons on what might be possible in the seed sector with liberalization of prices, removal of state subsidies, dismantling of

³ Here, regional extension programs refers to primarily to: (a) development (i.e., extension) agent services and farmer training centers provided at the *kebele* level; (b) subject matter specialist services and administrative support provided by *woreda* offices of the regional bureaus of agriculture; and (c) strategic, budgetary, and administrative support provided by the regional bureaus of agriculture.

state monopolies, and encouragement of private investment. By 1996, the introduction of such policies opened up the fertilizer market substantially, encouraging several private firms to import fertilizer, and creating opportunities for the entry of 67 private wholesalers and 2,300 retailers, representing a significant share of the domestic market.

However, since 1999, this lesson-learning opportunity disappeared as the independent private sector exited the fertilizer market. In the case of imports, the share of private firms operating in the market dropped from 33 percent in 1995 to 0 in 1999. Since then, the Agricultural Input Supply Enterprise (AISE) has taken the majority share, followed by “private” companies closely affiliated with, or owned by, the ruling front, and more recently, cooperative unions. Experiences in the wholesale and retail ends of the market were similar: As of 2004, the public sector accounted for over 70 percent of distribution, with private dealers accounting for only 7 percent of sales nationwide (DSA, 2006; EEA/EEPRI, 2006). Since 2005, while the share of party-affiliated companies has declined in all of these markets, cooperative unions have taken up the slack in importation, wholesaling, and retailing. Ultimately, the GoE expects the cooperative unions and their member cooperatives to manage the lion’s share of fertilizer distribution in the future.

The decline in private sector participation in fertilizer markets reflects several factors, including difficulties in the import process itself. Importing fertilizer requires that the importer obtain a license that is allocated by the GoE through a tendering process, and requires that fertilizer be imported in lots of 25,000 tons. The importer almost always requires financing given the sheer size of single shipment: Yet while a private sector buyer is required to deposit 100 percent of the value of the fertilizer consignment at the time a credit line is opened, the AISE, cooperative unions, and party-affiliated companies have privileged collateral requirements.

Difficulties are also evident in the estimation of demand and the distribution of fertilizer. Estimates of demand are compiled through official channels and aggregated to the national level as in the case of seed. Importers respond to official demand estimates and organize distribution through the regional bureaus of agriculture or cooperatives, depending on the region (DSA, 2006). This process, as with the importation process, tends to favor those firms or organizations with access to capital markets and with experience in navigating the regulatory and administrative systems at both the federal and regional levels.

What is the ultimate outcome of these successive transformations of the fertilizer sector? Although fertilizer consumption in Ethiopia increased in absolute terms from 250,000 tons in 1995 to 323,000 tons of product in 2004/05 (Figure 4), and although the growth of total fertilizer consumption was more rapid than the average for Sub-Saharan Africa over the same period, the application of fertilizer per hectare is similar to the average for eastern and southern Africa—an average that is well below comparable rates of application in other developing countries (Table 2: Crawford et al., 2006; Jayne et al., 2003).

Furthermore, growth in fertilizer consumption per hectare has increased only marginally over the past decade. Despite the huge demonstration programs, only 37 percent of farmers were using inorganic fertilizer, and application rates remained at around 16 kg/ha of nutrients (about 33 kg/ha of commercial product). There is also substantial evidence suggesting that many farmers have dis-adopted the seed-fertilizer technology packages over time (e.g. EEA/EEPRI, 2006) due to cost,

unavailability of preferred traits/varieties and other inputs from suppliers, a preference for local varieties, or other such factors.

Both the exit of private firms, the rise of party-affiliated companies, and the entry of cooperative unions are widely perceived as reflecting the lack of a level playing field in the fertilizer sector (Jayne et al., 2001). This suggests the need for further measures to introduce stronger competitiveness policies to revitalize private investment in importing, wholesaling and retailing fertilizer.

Rural Credit Services

However, seed and fertilizer are only part of the story, as their purchase is inextricably linked to the availability of rural credit. Beginning in 1994, regional governments in Ethiopia used a 100 percent credit guarantee scheme to stimulate the uptake of the PADETES improved seed-fertilizer packages. Under this system, about 90 percent of fertilizer is delivered on credit at below-market interest rates, displacing what had largely been retail sales from the private sector (including a substantial share on cash basis). In order to finance the packages, credit is extended to farmers by the state-owned Commercial Bank of Ethiopia, through cooperatives, local government offices, and more recently, microfinance institutions (MFIs) and one cooperative bank. Cooperatives have gradually assumed part of the guaranteed credit program, which had reached some four million farmers with guaranteed credit of nearly \$70 million in recent years. The financial products on offer, and their associated interest rates, are generally limited to seed and fertilizer purchases, animal fattening, beekeeping, and several other “recognized” investments.

Loan recovery, using extension agents and a degree of coercion by local administrative officials, was generally successful until the collapse of maize prices in 2001 and the subsequent drought. In Oromia Region, for example, recoveries had averaged above 80 percent up to 2001, but this figure dropped to 60 percent in 2002, forcing a major rescheduling of loans. This has resulted in high fiscal costs and fiscal risks associated with the loan guarantee program. The write-off to loan guarantees amounted to Ethiopian birr (ETB) 84 million in 2001, but by 2005 liabilities had again accumulated to ETB 183 million (DSA, 2006). Also in 2005, the Oromia Region was obliged to pay approximately ETB 84 million to the Commercial Bank of Ethiopia to honor its guarantees for the previous 3-year time period. The guarantee thus becomes a subsidy that is not accounted for in government budgeting.

As in the seed and fertilizer markets, the evidence suggests that current credit distribution system is increasingly ineffective and fiscally unsustainable in the long run. Moreover, the continued dependence on public guarantees and write-offs, below-market interest rates, and loan recovery by public extension agents and local administration is likely to hinder the emergence of competitive financial institutions in rural areas.

Agricultural Extension and Advisory Services

Agricultural extension in Ethiopia have traditionally been financed and provided almost entirely by the public sector. The current program has expanded extension’s coverage in Ethiopia and claims to reach around four million farmers (EEA/EEPRI, 2006). It is expected that this coverage will increase further: Since 2004, some 50,000 new extension agents (along with 15,000 existing agents) have been inducted into training programs and are being deployed throughout the country, thus expanding the size of the public extension staff four fold.

In addition, Farmer Training Centers (FTCs) are being constructed in each kebele, and the total number of FTCs is expected to reach 18,000 by the end of 2008. The FTCs are designed as local-level focal points for farmers to receive information, training, demonstrations, and advice, and include both classroom and demonstration fields. Each FTC will be staffed by three DAs (one each in the areas of crops, livestock, and natural resource management) and supported by a peripatetic DA covering several FTCs and trained in cooperatives management or a related field. Each DA is expected to train 120 farmers per year in his/her field of specialization through a broad range of demand-responsive extension and short-term training services.

These programs represent a significant public investment in extension in Ethiopia, amounting to over \$50 million dollars annually, or almost 2 percent of agricultural GDP. Yet in spite of this, there has been surprisingly little evaluation of the program's impacts. The few surveys that do exist suggest mixed results. Although many farmers initially adopted the packages promoted by the extension system, up to a third of the farmers who have tried a package had discontinued its use; while poor extension services were ranked as the top reason for non-adoption (Bonger et al., 2004; EEA/EEPRI, 2006). Moreover, extension effectiveness in Ethiopia continues to be measured in terms of targets for physical input use, at the cost of emphasizing the efficiency and profitability of input use. In fact, most extension workers view their role primarily as distributing seed, fertilizer and credit packages, which hampers the provision of technical advice (EEA/EEPRI, 2006).

The hierarchical "culture" underlying the extension system does little to encourage and exploit the inherent resourcefulness of those who work closely with farmers and rural communities (Gebremedehin et al., 2006). Farming communities do not participate in extension planning, and extension agents remain largely conveyors of technical messages, rather than active facilitators of community capacity building and providers of relevant information (EEA/EEPRI, 2006). And continued imposition of targets from above and weak local capacity have not yet permitted the emergence of a dynamic, demand-driven system.

Several changes have been introduced to address these deficiencies. To get beyond a focus on cereals, packages have also been developed to support other crop and livestock enterprises, improve post-harvest technology, and encourage natural resource management. Recognizing the diversity of smallholder farming systems in Ethiopia, classifications have been developed to divide the country into several distinct agro-ecological zones, which have been used in the development of more appropriate zone-specific packages (Ibrahim, 2004). And input distribution is being shifted away from extension to input supply offices and cooperatives. But a wide range of critics still argue that extension's impact in Ethiopia has been severely constrained by competing responsibilities placed on extension agents, by their entrenched routines and behaviors, and by a myopic emphasis on output figures.

Agricultural Education and Training

Ethiopia is host to some of Africa's oldest institutes of higher learning that focus specifically on the agricultural sciences. The country's formal agricultural education system currently consists of seven institutes of higher learning in the field of agriculture and 25 agricultural technical and vocational education and training (ATVET) colleges, all funded and managed by the federal and/or regional governments. This system is complemented by a sizable public agricultural research system led by

the Ethiopian Institute of Agricultural Research (EIAR), and complemented by seven regional agricultural research institutes.

While Ethiopia's cereal intensification efforts are closely tied to the ability of higher learning institutes and the research system to develop new and appropriate plant varieties, production techniques, farming equipment, and other technologies, it is the ATVET system that prepares the cadres of extension agents that will move these technologies off the shelf and into farmers' fields. At present, these 25 ATVET colleges are charged with training/retraining the 65,000 extension agents included under the GoE's latest extension program. While the majority of these extension agents will be deployed to the regional extensions systems (and ultimately posted to kebele-level FTCs), there is also some demand for their services from the private sector and civil society, for example, the rapidly-expanding horticulture sector.

Unfortunately, the demands of the GOE's latest extension program have strained the capacity of the ATVETs to provide appropriate and effective training (Davis et al., 2007). Resources allocated to many ATVETs are insufficient to conduct practical education (including training on tractors, combine harvesters, or other machinery, and experimentation with plant and animal breeding materials); to assist students in undertaking practical attachments (by covering their travel and living expenses during long-term attachments in the private sector or with public extension services); and to appoint qualified B.Sc.-level instructors with sufficient experience and practical training.

Moreover, ATVETs continue to depend on very traditional educational approaches and learning philosophies that revolve around conventional modalities of instruction, make limited use of modern educational infrastructure or equipment, and provide professionals and graduates with a relative small set of technical skills and abilities. Lectures and materials are often in English, although students' command of the language is usually quite limited. And curriculum content tends to overlook the importance of creating opportunities for students to build practical skills in decision-making, creative thinking, problem solving, and independent thought (Davis et al., 2007).

Critics also claim that the agricultural education system is too isolated to contribute effectively to Ethiopia's changing rural economy. Kassa (2004a, 2004b) argues that the agricultural education system suffers from weak linkages with research institutes, and extension services to meet the nation's development objectives. Gebremedhin et al. (2006) argue that the relationships between research, extension, and education at the woreda level are largely top-down, supply-driven, and unimodal, thus impeding the capacity of farmers to innovate and engage in the growing commercial economy.

These issues immediately translate into on-the-ground problems for the GoE's cereal intensification efforts. Extension agents are expected to promote yield-enhancing technologies, support community mobilization efforts, connect farmers to market opportunities and commercial agents, and train farmers in cooperative management and bookkeeping. Yet few have received training opportunities to adequately develop their potential in these areas, each of which requires a separate set of expertise and a high degree of innovative capacity, i.e., the capacity to adapt classroom information into knowledge that is useful in diverse real-world contexts.

Forward-Looking Scenarios

Given the evidence provided above, the question here is what types of institutional and organizational innovations are needed to improve the effectiveness of agricultural input, extension, and education systems in a manner that stimulates more rapid smallholder commercialization and agricultural growth. To be sure, no quick solutions exist. We examine several possible scenarios here. Note, however, that these scenarios are speculative.

Scenario 1: "Status quo." Give the evidence above, it would seem that the status quo cannot continue if smallholder commercialization and agricultural growth are to be accelerated. However, the impact of the status quo remains to be seen, largely due to the absence of any significant level of investment in evaluating the impact of the GoE's current investments in seed, fertilizer, credit, extension, and education. Were the GoE to invest more in impact evaluation, a better assessment of the status quo might be possible. This is a non-trivial concern because, in spite of the critical evidence presented above, there is strong support for the status quo within the GoE and the donor community.

Scenario 2: "The lightning fix." While structural adjustment programs have lost favor among both developing-country governments and multilateral finance institutions, it is still useful to consider a scenario in which far-reaching structural reforms are introduced rapidly into the Ethiopian economy. Consider, for example, a scenario in which the ESE was privatized, preferential treatment of state-supported (or state-friendly) fertilizer and credit suppliers was withdrawn, and regional extension programs were encouraged to source inputs from competitive bidders while also competing against private retailers at the local level.

The most likely outcome of a rapidly implemented reform program along these lines would be short-term disarray. ESE's capacity to produce seed during a transition into privatization could drop dramatically, while private seed producers, aiming to fill the gap, would struggle to expand into varietal improvement activities, scale up multiplication, secure procurement contracts with regional bureaus of agriculture, and build their own distribution networks. Although the fertilizer sector might fare better with private importers and distributors entering the market fairly quickly, the pressure on foreign exchange reserves could be significant, judging from recent and analogous experiences with cement imports. Credit providers, already saddled with bad loans, would likely pursue low-risk portfolio strategies in response to reforms, effectively choking off credit to many smallholders.

Meanwhile, regional bureaus of agriculture would have to restructure their entire administrative structure to introduce competitive bidding, ensure timely input procurement from private suppliers, and gear up their capacity to contend with competition from private input suppliers. Even a one-year decrease in the availability of inputs and extension services would likely have severe effects on agricultural growth and the wider economy. For so many reasons, this scenario is an unlikely one.

Scenario 3: "The slow fix." Assume a scenario in which similar reforms are implemented over a longer time horizon, say, 5-7 years, with a slightly more interventionist role from the state. In the seed sector, this process would involve the privatization of the ESE under terms that maintains its production capacity for the 5-7 year period. It would also involve introduction of reforms in the state's seed procurement policies to bring pricing into closer alignment with market signals, to

encourage procurement from competitive bidders, and improve the enabling environment for both of private seed production and retailing. In the fertilizer sector, this scenario would likely focus on re-opening the fertilizer sector to private companies and introducing policies designed to reduce and equalize collateral requirements across for all market agents, reduce the requirements on lot sizes, and encourage private investment through to the retailing level.

The rural credit system might similarly open up with policies designed to encourage lending to smallholders by private banks, cooperative banks, large savings and credit associations, and microfinance institutions. This would increase the number of players in the sector, diversify the types of financial products on offer, and introduce competitive rates and other loan terms. While state guarantees might not be withdrawn immediately, the possibility of providing guarantees (or other incentives) at levels less than 100 percent to a larger number of players in the rural credit system might be considered.

Making these types of medium-term reforms work would also require changes in public policies designed to encourage lending. At present, few private banks lend to seed producers without 100 percent collateralization from non-agricultural assets. Yet there is scope for the introduction of banking policies that favor seed producers, agroindustry, input production, and other agricultural sector investment similar to those currently favoring the floraculture industry. Despite the obvious risks involved in lending to agricultural investors (rainfall variability, market volatility, and so on), a forward-looking agricultural development-led industrialization policy must prioritize these types of ventures.

A good starting point for reforms might be the maize sector where private seed producers can quickly recoup their returns on investment. In doing so, there might even be an opportunity to encourage the entry of foreign seed companies—building on the presence of Pioneer—from North America, Europe, and eastern/southern Africa.

What remains to be addressed in this scenario is the underlying role and contribution of agricultural extension and education. A medium-term scenario like this would allow the extension and education systems to begin processes of deep reform—reforms that are designed to extricate the system away from single-minded, top-down, package approaches to cereal intensification, to more dynamic, responsive, and competitive service provision. These types of approaches will require greater flexibility within the current system that can only be done by investing time, effort, and resources in changing the cultures and practices of extension and education systems, and are likely to yield results over a much longer-term period. However, without such changes, the extension and education system in Ethiopia will become increasingly irrelevant to the needs of intensive, commercial smallholder production systems.

Conclusions and Recommendations

Many of Ethiopia's state-led policies put in place to promote cereal intensification and smallholder commercialization have outlived their usefulness. A rethinking of approaches is needed, one that reallocates the roles of the public and private sectors in the country's agricultural input, extension, and education systems. This rethinking requires a nuanced understanding of the complex issues involved, evidence-based analysis and policy recommendations, and continuous debate on the pros and cons of alternatives and options.

Ultimately, given the GoE's priorities for agriculture and rural development, this paper implicitly suggests several points for further consideration. First, efforts to introduce technology packages must consider the wide variance in institutional and agroclimatic situations in the country's smallholder economy to develop locally-specific solutions rather than national campaigns. Second, the conventional role of the public sector in all aspects of smallholder production must be changed to allow for the entry of private players who can contribute much to increasing productivity and commercializing surplus output. Third, policies that target or favor one type of organization over another (e.g., party-based companies, state-owned enterprises, or cooperative unions) in the provision of inputs or services for smallholders are generally ill-conceived and unsustainable.

This is not to say that the public provision of inputs, credit, and information is unnecessary. Rather, public intervention will remain a critical component of an agricultural economy characterized poor market infrastructure and access, weak purchasing power among smallholders, and asymmetrical access to information. However, the absence of some degree of heterogeneity and competition among inputs and service providers in rural Ethiopia may be a constraint on growth. The development of a more dynamic and competitive agricultural sector in Ethiopia requires the introduction of rural institutions and organizations that respond effectively to rapidly changing market and technological conditions. This suggests the need for policies and programs designed to create more space for both public and private input and service providers in the rural economy.

Table 1. Yields in on-farm field trials vs. farmers' yields, 2000-2004 (metric tons/hectare)

Crop	NAEIP (1995-1999)		SG2000 (1993-1999)		Current farm yields (2000-04)
	Improved	Traditional	Improved	Traditional	
Maize	4.73	1.57	4.60	1.57	1.82
Wheat	2.93	1.17	2.31	0.95	1.31
Sorghum	2.79	1.12	2.08	0.92	1.21
Teff	1.43	0.85	1.62	0.64	0.82
Barley	2.15	1.00			1.05

^a NAEIP is the National Agricultural Extension Intervention Program. Source: World Bank, 2006a.

Table 2. Comparison of modern varieties (MVs) and fertilizer use among different countries and regions, 1997-2002

Country/region	Area under wheat MVs (% of area) ^a			Area under maize MVs (% of area) ^b			Fertilizer usage (kg/ha of arable and permanent cropland) ^c		
	1997	2002	2006	1997	1999	2006	1997	1999	2002
Ethiopia	51	65	--	5	15	20	13	16	14
Eastern/Southern Africa	66	87	--	46	72	47	13	13	15
Western/Central Africa	99	--	--	38	--	--	2	3	3
South Asia	92	94	96	48	46	70	99	110	101

^a Denotes the proportion of total wheat cultivation area that is cultivated with improved (semi-dwarf) wheat varieties. Sources: for 1997, Pingali, 1999; for all other years, De Groote, pers. comm., 2007.

^b Denotes the proportion of total maize cultivation area that is cultivated with improved maize hybrids or improved openly-pollinated varieties. Sources: for maize in Ethiopia, CSA (2006, 2004, 2001), FDRE, 2004; all other countries, De Groote, pers. comm., 2007.

^c Source: FAOSTAT, 2005

Table 3. Hybrid maize seed production by company, 2004

Company	Amount produced (quintals)	Percent of total hybrid supply
ESE	52,105	70.0
Pioneer Hi-Bred	12,000	16.1
Hawas Agro Business	180	0.2
Awassa Farm Development Enterprise	962	1.3
Awassa Green Wood	3,500	4.7
Hadiya Trading Enterprise	1,100	1.5
Bako Agricultural Research Center	3,162	4.2
Ano Agro Industry	612	0.8
Anger Farm	842	1.1
Total	74,463	100.0

Source: FDRE, 2005.

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Keywords: Challenges, Prospects, Agricultural Production, Productivity, Ethiopia 1. INTRODUCTION The history of agricultural and rural development since the end of World War II in 1945 is characterized by changing priorities and concerns. Immediately after this war and the widespread experience of serious malnutrition, there was a determined effort to increase food production in the developed world (Reimund et al., 2007). (2012) the impacts of investments in road infrastructure on agricultural output and productivity are particularly important in Sub-Saharan Africa for three reasons. First, the agricultural sector accounts for a large share of gross domestic product (GDP) in most Sub-Saharan countries. Second, poverty is concentrated in rural areas. agricultural production and the rapid population growth. largely explain the food insecurity in Ethiopia. It is. direct the flow of goods and services. If there are move- ments of grains from surplus to deficit areas, they are. agricultural extension advice. Several reports indicated. that these projects were successful in enhancing crop. productivity and farm-household income (Belete, 1989). Meanwhile, in 1970, the Extension and Project. Implementation Department was formed by the Ministry. of Agriculture in order to disseminate minimum-package. The Market for Agriculture in Ethiopia is Segmented by Type into Food Crops, Fruits, and Vegetables. The Report includes the Production Analysis (Volume), Consumption Analysis (Value and Volume), Export Analysis (Value and Volume), Import Analysis (Value and Volume), and Price Trend Analysis. Download Free Sample Now. Home Industry Reports Agriculture Agriculture in Ethiopia - Growth, Trends, COVID-19 Impact, and Forecasts (2021 - Table Of Contents. Download Sample. Production of cereals accounts for the second-largest share in the economic contribution of the agricultural sector in Ethiopia. More than 80.0% of agricultural land is used for the production of cereals, which makes use of 60.0% of the rural workforce.