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**In-Depth Assessment of the
Public Agricultural Extension System of Ethiopia and
Recommendations for Improvement**

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ABSTRACT

Eighty-three percent of the population of Ethiopia depends directly on agriculture for their livelihoods, while many others depend on agriculture-related cottage industries such as textiles, leather, and food oil processing. Agriculture contributes about 46.3 percent of gross domestic product (GDP) (World Bank 2008) and up to 90 percent of total export earnings. As part of the current five-year (2006–2011) Plan for Accelerated and Sustained Development to End Poverty (PASDEP), the government is continuing to invest heavily in agriculture. A core part of the government's investment in agriculture is the public agricultural extension system.

This study was conducted to assess the strengths and constraints of the public extension system and to provide suggestions on “best fit” solutions and their scale-up opportunities. The review used a variety of analytical tools to develop the overall findings, including extensive field visits to six of nine regions in Ethiopia; interviews with farmer trainees at farmer training centers (FTCs), more than 100 extension personnel, extension experts, nongovernmental organization (NGO) groups, and government representatives; and a literature review on Ethiopian extension. The study assessed strengths and constraints in the field-level extension system, the ATVET system, and the extension institutional environment. The researchers also considered the overall enabling environment within which extension operates.

The field-level extension service has a strong foundation of FTCs and trained development agents (DAs) already in place in the field. Roughly 8,489 FTCs have been created throughout Ethiopia, and about 62,764 DAs have been trained in total, with a reported 45,812 staffed on location. *Woreda* (district) and regional offices are adequately staffed. DAs and *woreda* staff have strong technical skills and theoretical knowledge, and are generally trained as specialists. Pockets of entrepreneurialism and innovation exist in specific FTCs and *woredas*.

While acknowledging these strengths, the researchers also identified several sets of constraints within the field-level extension system that will require attention. Basic infrastructure and resources at the FTC and *woreda* level remain a major constraint, particularly in relation to operating funds: the vast majority of FTCs and *kebeles* do not have operating equipment or inputs to pursue typical extension activities on the demonstration farm. There are major “soft” skill gaps for DAs and subject matter specialists (SMSs) in the FTCs and *woredas*, and their ability to serve farmers is limited given a lack of practical skills. Finally, the overall field-level system is often limited in its ability to meet farmer needs and demands; mechanisms to make it more farmer-driven and market-oriented would yield greater results.

The authors employed a similar approach at the ATVET level to identify strengths and constraints. Strengths at the ATVET level include a strong record of training broad groups of DAs, a strong technical curriculum, and some pockets of innovation and practical training, including linkages to markets and farmers. Constraints include limited success in enabling DAs to gain practical experience, particularly related to their internships at the *woreda* level; limited linkages to the broader educational system and research system in Ethiopia; and a general lack of resources to effectively transmit the required skill set to DAs.

The countrywide enabling environment in which extension operates is critical to extension efforts. Various aspects of the enabling environment were considered, including seed and other inputs, water management, and credit systems, as well as producer groups. Constraints were also assessed, leading to the conclusion that the enabling environment requires strengthening, particularly in the areas of seed and credit, if extension is to achieve its full potential impact.

Keywords: DA, FTC, ATVET, extension, agriculture, Ethiopia

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ABBREVIATIONS AND ACRONYMS

ADLI	Agricultural Development-Led Industrialization
AGP	Agricultural Growth Program (World Bank program)
ASE	Agri-Service Ethiopia
ATVET	Agricultural Technical and Vocational Education and Training
BMGF	Bill and Melinda Gates Foundation
BOARD	Bureau of Agriculture and Rural Development
BPR	business process reengineering
CADU	Chilalo Agricultural Development Unit
CIPP	Comprehensive Integrated Package Project
DA	development agent
DF	demonstration farm
DFID	U.K. Department for International Development
ECX	Ethiopia Commodity Exchange
EDRI	Ethiopian Development Research Institute
EEA	Ethiopian Economic Association
EEPRI	Ethiopian Economic Policy Research Institute
EIAR	Ethiopian Institute of Agricultural Research
ELTAP	Ethiopia Land Tenure and Administration Program
ESE	Ethiopian Seed Enterprise
FAO	Food and Agriculture Organization of the United Nations
FREG	farmer research extension group
FRG	farmer research group
FSCB	Food Security Coordination Bureau
FTC	farmer training center
GDP	gross domestic product
GOE	Government of Ethiopia
HABP	Household Asset Building Programme (DFID program)
ICT	information and communication technology
IECAMA	Imperial Ethiopian College of Agriculture and Mechanical Arts
ILRI	International Livestock Research Institute
IPMS	Improving Productivity and Market Success (ILRI program)
JICA	Japan International Cooperation Agency

MFI	microfinance institution
MFTR	Memorandum of Foreign Trade Regime
MOARD	Ministry of Agriculture and Rural Development
MOE	Ministry of Education
MPP	Minimum Package Program
NEIP	National Extension Intervention Program
NGO	nongovernmental organization
NRM	natural resource management
OOARD	Office of Agriculture and Rural Development
PADETES	Participatory Demonstration and Training Extension System
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PPP	public–private partnership
RARI	regional agricultural research institute
RCBP	Rural Capacity Building Project
RREFLC	Regional Research Extension and Farmer Linkage Council
SG-2000	Sasakawa Global 2000
SMS	subject matter specialist
SNNPR	Southern Nations, Nationalities, and People’s Region
SSA	Sub-Saharan Africa
T&V	Training and visit
TVET	Technical and Vocational Education and Training
WAC	<i>woreda</i> advisory committee
WADU	Wolayita Agricultural Development Unit
WELC	<i>woreda</i> extension linkage center
WTO	World Trade Organization
ZREFLC	Zonal Research Extension and Farmer Linkage Council

1. INTRODUCTION

Eighty-three percent of the population of Ethiopia depend directly on agriculture for their livelihoods, while many others depend on agriculture-related cottage industries such as textiles, leather, and food oil processing. Agriculture contributes up to 50 percent of gross domestic product (GDP) and up to 90 percent of foreign currency through exports.

On the whole, Ethiopia has ample resources for agriculture. The country has 111.5 million hectares of land, and although 74 million hectares are arable, only 13 million hectares are being used for agricultural activities.¹ Water resources are also plentiful in much of the country. There are about 12 million farmer households providing human resources. Ethiopia's livestock resources are among the top in the world, at least in terms of quantity.² The country also has a high level of biodiversity, with several different economically important crops indigenous to the country (such as teff).

In spite of these resources, many challenges confront policymakers and other agents of change. These include the growing demand for food and agricultural products to feed nearly 80 million people, the growing income gap between urban and rural areas, dwindling natural resources, and poverty and food insecurity (it is estimated that some 6.4 million people required emergency assistance in late 2008 [IRIN 2008], and 7.5 million people are chronically food insecure and must receive assistance through a social welfare scheme [IRIN 2009]).

The agricultural sector—and institutions that support it, such as extension—is thus key to poverty reduction in Ethiopia. Beginning in 1992 with the Maputo Declaration, the Government of Ethiopia (GOE) began an unprecedented public investment in the agricultural sector. At a time when many governments in Africa were curtailing support for the agricultural sector, the GOE instituted a policy of Agricultural Development–Led Industrialization (ADLI). In 2008, 16 percent of the government budget was committed to the agricultural sector. In recent years, high rates of economic growth have been linked to increases in the area cultivated and in agricultural productivity (Byerlee et al. 2007; Diao et al. 2007).

As part of the current five-year (2006–2011) Plan for Accelerated and Sustained Development to End Poverty (PASDEP), the government is continuing to invest heavily in agriculture. To enable this, the Ministry of Agriculture and Rural Development (MOARD) has developed a document outlining rural development policies, strategies, and instruments (Ethiopia, MOARD 2001). The basic directions of agricultural development include the utilization of human labor, proper use of agricultural land, the combining of endogenous and exogenous knowledge (a “foot on land”), a focus on innovations adapted to agroecological zones, and an integrated development approach. The MOARD has aligned donor support with plans to scale activities in the sector and to meet the resource gaps identified. A core part of the government's investment in agriculture is the public agricultural extension system.

Ethiopia's achievements in rural development and extension as a result of this commitment and strategy include increased “modernization” and revitalization of agriculture through improved and new crops, livestock, and natural resource management (NRM) technologies. They also include the increase in input use by farmers. Use of improved seed varieties is on the rise, although supply remains a bottleneck in the system. The professional capacity of extension has also dramatically increased; over 60,000 development agents (DAs) have graduated from the Agricultural Technical and Vocational Education and Training (ATVET) colleges in the past six years with three-year diplomas (prior to 2000, the existing 15,000 DAs had received about nine months' training).

However, although there have been great strides in agriculture, productivity remains low. Compounding this, inputs are scarce and expensive, and market and credit access are extremely limited. Within extension, the dramatic changes in government policy over three eras of governments, each pursuing a different policy agenda, have affected its efficacy. Even within the current system of

¹ State minister, H. E. Dr. Abera Deresa, MOARD, personal communication, May 2009.

² State minister, H. E. Dr. Abera Deresa, MOARD, personal communication, May 2009.

government, there has been a tremendous amount of restructuring. The ongoing business process reengineering (BPR) is the latest in a long line of substantial changes within government ministries.

Thus, in spite of past successes achieved through extension, there are also constraints and gaps. There are many ways to continually make improvements to support the country's agricultural goals, including moving beyond a staple crop production focus; increasing farmer participation; developing capacity at the decentralized level; improving links to and creating space for other innovation system players such as farmer groups, research, the private sector, and civil society; giving due attention to women farmers and pastoralists; and increasing focus on marketing, high-value crops, and related inputs.

To help improve the agricultural extension system, the Bill and Melinda Gates Foundation (BMGF) was requested by the GOE to undertake a review of agricultural extension in the country. The purpose was to assess the strengths and constraints of the public extension system and to provide suggestions on best-fit solutions, in close consultation with the government and other stakeholders.

Four major programmatic components of the Ethiopian extension system were examined:

- **Participatory Demonstration and Training Extension System (PADETES) (EEA/EEPRI 2006)**
In 1995, the government introduced PADETES, a system that now reaches some 35 to 40 percent of farm households in rural areas. PADETES provides a small amount of inputs through packages provided directly to farm households, and functions with a low number of visits by public DAs.
- **Farmer training centers (FTCs)**
Since 2002, more than 8,489 FTCs have been built at the *kebele* (the lowest administrative division) level. The centers are staffed by DAs and are responsible for providing extension activities in rural areas. Core activities concern livestock, crop production, and NRM.
- **Agricultural technical and vocational education (ATVET)**
In 2000, the government invested in ATVET centers to train DAs charged with carrying out agricultural extension activities with farm households. By the close of 2008, the program had trained 62,764 DAs at the diploma level.
- **Institutional coordination**
The rapid expansion of the extension system has brought with it an administrative model to support an extensive set of responsibilities, adapting to 32 agroecological zones and supporting a DA corps of roughly 60,000.

The paper is organized as follows. Section 2 describes the methods used to collect and analyze data. Section 3 provides background information on agriculture and extension in Ethiopia, including a summary of previous studies and a discussion of the current PADETES program, as well as addressing how to transform extension systems. Section 4 provides an overall assessment at the field level of the Ethiopian extension system, looking specifically at the strengths and constraints of the system at the regional/zonal, *woreda*, and *kebele* levels. Section 5 describes the training program for DAs through the ATVET system. Section 6 addresses the enabling environment and its importance for extension to work effectively and efficiently. Section 7 discusses alternative methods and approaches to achieve system sustainability and “best fit” solutions to address constraints found in the system. Finally, Section 8 provides an overall set of recommendations and implementation guidelines for strengthening and improving the Ethiopian extension system.

2. METHODS

The BMGF contracted a team of extension specialists and international management experts to conduct a full review of the Ethiopian extension system. Throughout the review, MOARD management provided consistent support, oversight, and input. The BMGF also provided support during the study. As a part of the process, the review team engaged a wide set of stakeholders, including the Ethiopian Development Research Institute (EDRI), Ethiopian Economic Association (EEA) / Ethiopian Economic Policy Research Institute (EEPRI), relevant local institutions, bi- and multilateral donors, nongovernmental organizations (NGOs), and national agricultural universities.

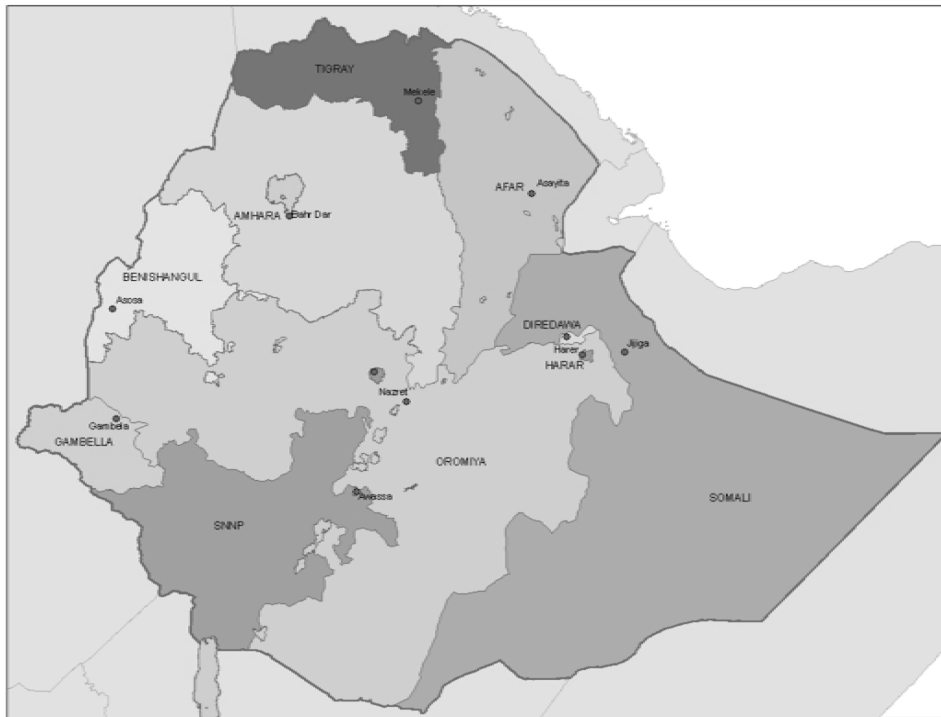
Data Collection Methods

Methods used to collect information for the study included a desk review of relevant literature, including successful case studies from several Asian countries; informant interviews; stakeholder consultations; focus groups; and field visits to six of the nine regions of Ethiopia. A pretest of data collection instruments was also conducted in Addis Ababa and the Oromiya Region. More details on the interviews and data sources can be found in the appendix.

A significant component of the study was the field visits to the regions (Figure 1). Six regions and nine *woredas* were identified by criteria that would allow the study to cover a diverse set of agroecologies, regions, and production systems with the time and personnel available, and to reflect a wide range of local extension and ATVET experiences. In each region, the authors interviewed farmers and farmer groups, regional heads, office heads, subject matter specialists (SMSs), and DAs. At the ATVETs, the authors interviewed administrators, instructors, and students. The regions covered were the following:

- Afar Region: Semera Town, Gewane Town, and Assayita *woreda*
- Amhara Region: Bahir Dar Town and Bure and Dejen *woredas*
- Benishangul-Gumuz Region: Assosa Town and Assosa *woreda*
- Southern Nations, Nationalities, and People's Region (SNNPR): Hawassa City and Dilla Zuria *woreda*
- Tigray Region: Mekelle City and Wukro and Atsibi *woredas*

Figure 1. Map of Ethiopia showing major regions and their capitals



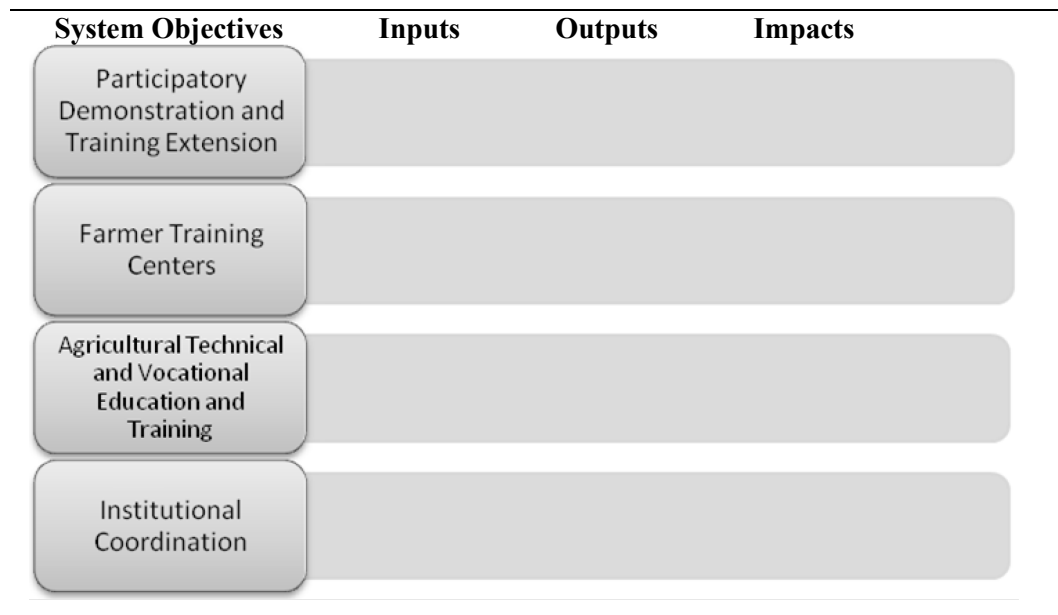
Source: Ethiopia Strategy Support Program 2009.

The authors also documented complementary programs and projects that interact with the public extension system. For instance, the International Livestock Research Institute (ILRI) has a countrywide project called Improving Productivity and Market Success (IPMS). The goal of IPMS is to increase the uptake and impact of technologies for smallholder farmers and pastoralists in Ethiopia in order to accelerate market-oriented agricultural development (ILRI and Ethiopia, MOARD 2005). In addition, MOARD's Rural Capacity Building Project (RCBP) is working throughout the country, focusing on certain *woredas* and strengthening ATVETs (Kreuchauf 2008). The RCBP was initiated under the MOARD, with a focus on building human resources capacity in extension (ATVETs) and supporting FTCs with physical infrastructure, agricultural research, and institutional capacity building. RCBP *woredas* that were covered in this review include Assayita *woreda* in Afar, Bure (also IPMS) and Dejen *woredas* in Amhara, Wukro and Atsibi *woredas* in Tigray, and Tiyo *woreda* in Oromiya.

Analytical Methods and Approaches

The authors employed different analytical approaches to identify the strengths and weaknesses of the Ethiopian extension system. Building on quantitative and qualitative data gathered in the field, the authors employed a systems analysis across four major components of the extension system (Figure 2).

Figure 2. Systems framework for extension analysis



Source: Authors.

The authors also applied an additional analytical lens to the findings based on private-sector experiences in transformational change programs. This framework, designed to analyze the strengths and weaknesses of a transformational change program such as an extension system, allowed the authors to analyze the various working components of Ethiopian extension as they related to **systems and management, mind-sets and capabilities, and infrastructure and resources**. This approach also introduced the concept of the enabling environment in which extension operates, which the authors briefly analyzed.

Beyond the strengths and constraints analyses completed by the authors, best-fit solutions in extension were identified that could be applied and scaled in the Ethiopian extension system. Many of these best-fit solutions came from specific regions, *woredas*, and *kebeles* the authors visited; these best-fit solutions were enriched by the authors' knowledge of and experiences with other countries' extension systems.

These analyses led to the development of a broad set of recommendations designed to strengthen the Ethiopian extension system, building on the current foundation and addressing the major constraints identified by the authors. The authors developed an initial findings document and slide presentation for communication with the broader stakeholder community.

This document was presented to the MOARD for professionals and experts to provide comments. The authors continued to receive feedback on the write-up via regular briefings with MOARD staff, cross-checking with local experts, and team meetings. A draft copy of the document was circulated to MOARD staff and bureau heads for comments. In addition, stakeholder consultations continued. The findings were presented at the annual meeting of the EEA, and feedback from academics was incorporated into the document. Another consultation took place with a panel of Ethiopian extension experts and researchers who had briefed the authors at the beginning of the study. The authors went back to the same experts (with additional stakeholders) to brief them on the findings and to receive feedback.

Following various reviews, a stakeholder meeting was held for extension personnel, researchers, NGOs, and policymakers to validate and refine the findings and recommendations for the final version of the document. The purpose of this meeting was to ensure that there was wide stakeholder agreement on the way forward. The authors held a two-and-a-half-day workshop with DAs, SMSs, regional bureau heads, extension heads, MOARD staff, research staff, ATVET heads, and Sasakawa-Global 2000 (SG-

2000) staff to brief them on the findings and obtain feedback and validation, and to discuss in detail with these stakeholders how to actually implement the recommendations.

This stakeholder meeting was critical in helping the authors develop findings and recommendations. In particular, stakeholder and expert feedback on the Ethiopian enabling environment, DA motivation and retention practices, the need for a systemwide view of extension, and the role of the generalist versus specialist DA in extension led to specific findings and recommendations that strengthen the paper. A summary of stakeholder feedback is included in Appendix A.

In sum, the analysis attempted to ensure the rigor and reliability of the results by covering a wide range of geographic locations, by speaking with a wide range of stakeholders (including the private and civil-society sectors), through triangulation of data sources, and by continual feedback from the MOARD, a panel of Ethiopian development experts, and other stakeholders.

3. BACKGROUND AND LITERATURE REVIEW

This section provides details on the history of agricultural extension in Ethiopia and the current extension system. Key lessons from alternative extension approaches are shared that inform the overall study.

Review of Extension Models in Ethiopia

This study builds on previous recommendations and reviews of the Ethiopian extension system (current and past models). Because several excellent reviews of past Ethiopian extension systems already exist (see Abate 2007; EEA/EEPRI 2006; Kelemework 2007), this paper touches only briefly on the various systems and programs of government extension in Ethiopia. (See Appendix C for an annotated bibliography detailing the various papers and studies reviewed and additional findings from this extensive literature review.)

Introduction to Approaches by the Government on Extension

Extension in Ethiopia has been subject to radical policy shifts in the past 50 years, from feudalism to Marxism to a free market system (Kassa 2005). Currently, extension is provided primarily by the public sector, operating in a decentralized manner through which extension is implemented at the *woreda* (district) level. Limited extension is conducted by NGOs, usually working through the *woreda*-level Bureaus of Agriculture and Rural Development (BOARDS).

While commercialization of agriculture is seen by the government as a focal point for agricultural development (Gebre-ab 2006), this market orientation is not fully operationalized (Gebremedhin, Hoekstra, and Tegegne 2006). Instead, most of the government interventions favor food-security-oriented rather than market-oriented approaches.

In practice, much of the production and food security focus has been implemented in a top-down, supply-driven way from the federal level to achieve national goals (Abate 2007; EEA/EEPRI 2006; Gebremedhin, Hoekstra, and Tegegne 2006; Kassa and Abebaw 2004; Kassa 2002; Kelemework 2007). Extension's emphasis on production, technology, and food security is also seen in the fact that DAs are still being trained in the three areas of crops, livestock, and NRM, rather than in marketing or market-oriented agriculture. For the most part, extension tends to focus on crops, especially cereals, and to leave out cash crops, NRM, and livestock (EEA/EEPRI 2006; Kassa 2002). It does so using a production-oriented package approach (Gebremedhin, Hoekstra, and Tegegne 2006). The Ethiopian PADETES approach offers three main extension approaches, which are formulated at the federal level: household, regular, and minimum.

In extension programs, little attention is paid to gender, culture, youth, HIV/AIDS prevalence, agroecosystem variance, or local demands (Ashworth 2005; EEA/EEPRI 2006). Although gender training and mainstreaming take place in some BOARDS, women-focused extension is limited, and gender considerations are missing at all levels (Buchy and Basaznew 2005).

Also, indigenous knowledge, which is an important component of an innovation system, is not appreciated enough in the system and is disappearing, in part due to the focus on the promotion of modern packages, which tend to be preferred by extension and research at the expense of indigenous knowledge (Efa, Gorman, and Phelan 2005)

There is a need to fit extension approaches to various agroecological zones (Abate 2007; Lemma and Hoffman 2006); until recently, most packages were formulated at the federal level (EEA/EEPRI 2006). Irrigation extension is also neglected in the approach (Abera and Teshome 2009). There is a great need for a strategic vision of the future of extension (Ashworth 2005).

Pastoral and agropastoral areas make up almost 65 percent of the total land of Ethiopia (EEA/EEPRI 2006) and contain at least six million people. Due to the culture and lifestyle of these traditionally nomadic people, they are difficult to reach using traditional extension methods and topics. They are also in high-risk areas where communities are often supported with food aid programs

administered by NGOs under government coordination. These NGOs also focus on water resource development and education, as well as human and animal health (EEA/EEPRI 2006).

For many years there was no pastoral/agropastoral extension package; however, extension packages are now being developed and transferred to pastoral households, including packages focusing on water and feed resources, as well as animal health (EEA/EEPRI 2006). To date, mostly animal-fattening programs have been presented to pastoralists by livestock extension DAs.

Government policies, strategies, and instruments to assist pastoralists include provision of drinking water and pastureland (including grazing land administration), respecting indigenous animal husbandry skills, ensuring animal healthcare and vaccination services, and improving the livestock marketing system (Ethiopia, MOARD 2001).

Among pure pastoralists, the government is promoting rangeland management and improved forage. While there is a plan to have one animal health clinic per *kebele*, so far there is only one per three *kebeles*.

Models and Approaches of Extension Used in Ethiopia

Ethiopia has had government agricultural extension services since the 1950s, when a model similar to the United States Land Grant approach was used, in which universities reached out to communities with research-based knowledge and through adult education. The Imperial Ethiopian College of Agriculture and Mechanical Arts (IECAMA) provided extension services in addition to research and teaching.

In 1963, the Ministry of Agriculture was established, and the mandate of extension provision was transferred to this institution. The Ministry of Agriculture established extension departments at the headquarters and provincial levels (Abate 2007).

During this time, several national development plans were devised, the last of which supported small-scale farmers through comprehensive package programs (Comprehensive Integrated Package Projects, or CIPPs), the most prominent of which were the Chilalo and Wolayita Agricultural Development Units (CADU and WADU). CADU was established in Arsi to improve living standards through increased production and infrastructure. The WADU program, based in Wolayita, although still focused on improving living standards, based its approach on agroecological zones (Abate 2007).

A minimum package (Minimum Package Program—MPP1 and MPP2) approach then followed these programs, to help to scale up the CIPPs. MPP1 lasted from about 1971 to 1975. The country then moved into a socialist period. During this time the government implemented “quasi-participatory extension approaches” and continued with the MPP2 program until 1985. Much of the focus during this time was on land reform. The MPP2 program ended around 1985 (Abate 2007).

In the mid-1980s, various new programs were implemented, such as the National Program for Food Self Sufficiency (1986–1989), the Modified Training and Visit (T&V) Approach, and the Peasant Agriculture Development Extension Projects (1986–1995) (Abate 2007).

In 1993, the NGO SG-2000 promoted the use of productivity-enhancing technologies and access to inputs and credit, coupled with training using 1/4- to 1/2-hectare demonstration plots that were closely supervised by research and extension. SG-2000’s goal was to increase food production and stimulate links between research and extension. Via its on-farm demonstration plots, SG-2000 showed that with sufficient inputs and supervision and management, farmers could double or triple their yields of maize and wheat.

The success of the SG-2000 pilots led in 1995 to the transitional government adopting PADETES for extension. This was based in part on the T&V system as well as the SG-2000 pilots. This falls under the National Extension Intervention Program (NEIP) strategy. The goal of PADETES is to improve incomes via increasing productivity, ensure self-sufficiency in food production, establish farmer organizations, increase production of export crops, conserve natural resources, and increase women’s participation in development.

PADETES uses a similar approach to SG-2000 together with a modified T&V approach, but extended the technology packages to include livestock, high-value crops, postharvest technologies, and agroforestry. PADETES intended to use a menu-based approach rather than the former package approach.

The PADETES program saw a massive increase in the number of farmers adopting improved agricultural technology, from 35,000 in the beginning to over 3.6 million. This program was closely monitored by the government. However, the high productivity levels of maize growers, coupled with a bumper crop in 2001/02, led to a massive oversupply accompanied by a huge drop in maize prices. The realization set in that other issues, such as marketing and capacity, had to be dealt with in addition to inputs and production. In addition, it became apparent that the yields on the upscaled plots were not as high as those on the original demonstration plots, due in part to a lack of sufficient supervision by the extension staff.

Recognizing that many of the challenges faced by the PADETES program resulted from insufficient extension staff, the government acknowledged the need for additional human resources in extension in order to continue to bring about high rates of adoption and production. The plan to use the Technical and Vocational Education and Training centers (TVETs) to produce additional development agents was undertaken.

PADETES Reviews

Several reviews of the PADETES program have been performed. The major one, conducted by the EEA/EEPRI, evaluated PADETES in 2005 (EEA/EEPRI 2006). According to the results of the study, Ethiopia's current PADETES model has shown the following significant achievements:

- Reached many farmers equitably
- Increased productivity in some cases
- Increased production of grains
- Increased use of fertilizer and improved seed
- Increased numbers of participating households in extension packages
- At the same time, on the negative side, PADETES has also shown the following weaknesses:
- Majority of extension packages are on crop production
- Extension is supply-driven
- Extension packages are formulated at the federal level and there is a lack of regional strategies
- Narrow focus on cereal crops
- Limited focus on cash crops and animals
- Incomplete use of packages by farmers, with 75 percent disadoption (started but not continued)
- Limitations in infrastructure, marketing, and inputs affected implementation
- Limited participation by women farmers
- Limited training for extension workers

The PADETES program has been an aggressive extension intervention that has involved 4.2 million participants from a total of about 10 million small-scale farmers in the country (Kelemework and Kassa 2006).

Other Studies

In other studies of the impact of extension in Ethiopia, researchers showed that receiving at least one visit from a DA raised production growth by 7 percent and reduced poverty by 10 percent (Dercon et al. 2008).

FTCs at the *kebele* level were also identified as a critical resource needed to enable extension delivery. The FTCs were designed as local-level focal points for farmers to receive information, training, demonstrations, and advice, and included both classrooms and demonstration fields. The FTCs are expected to form an important node between extension and farmers in the agricultural sector. FTCs are managed at the *kebele* level, but funding for capital, operational, and salary costs come from the *woreda* level.

Each FTC is to be staffed by three DAs (one each in the areas of crops, livestock, and NRM) and supported by an itinerant DA covering three FTCs and trained in cooperatives management or a related field (Spielman et al. 2006). Each DA is expected to train 120 farmers per year in his or her field of specialization. He or she is also expected to provide modular training to 60 farmers every six months in his or her field of specialization (Ethiopia MOFED 2007).

Related to this massive scale-up of human and infrastructure resources for agriculture, in 2007 the RCBP was initiated under the MOARD. The RCBP focuses on the building of human resources capacity in extension (ATVETs) and supporting FTCs with physical infrastructure, agricultural research, and institutional capacity building. The RCBP also has been implementing institutional innovations such as decentralization and farmer-innovation financing mechanisms in a few select *woredas*.

Other projects, such as Improving Productivity and Market Success (IPMS), are also supporting local extension in selected areas. The project works in 10 pilot learning sites to develop a community-based market-oriented agricultural program. This program will help facilitate access to agricultural innovations (technologies, policies, and processes) and to strengthening the capacity of institutions to better serve farmers and communities. Particular attention will be paid to farmers and communities around FTCs that are located in the farming systems for which the market priorities are identified (IPMS 2005).

The authors analyzed the various working components of Ethiopian extension as they related to **systems/management and linkages**, **mind-sets and capabilities**, and **infrastructure and resources**, the **enabling environment**, and the **institutional environment**. This approach also introduced the concept of the enabling environment in which extension operates, which the authors briefly analyzed.

Analysis of Working Components of Ethiopian Extension

Systems/Management and Linkages

Ethiopia's agricultural innovation system is growing in complexity: new actors, policies, technologies, and relationships are affecting the system (Spielman et al. 2007). However, the public sector is the single most important player, especially in terms of inputs, at the local level for smallholders. The private sector and NGOs, although they are becoming increasingly important, are often left out of extension initiatives, or cooperation is weak (EEA/EEPRI 2006; Spielman et al. 2007). However, NGOs in particular have instituted many innovative and participatory approaches (FAO 2008a, 2008b).

Research and extension activities are carried out by different organizations without much coordination (Kassa 2002). Thus, these linkages are often poor. While extension falls under the MOARD, most research activities come under the Ethiopian Institute of Agricultural Research (EIAR) and the regional agricultural research institutes (RARIs). Although EIAR and the RARIs attempt to address this issue through research-extension coordinators or a department focused on coordinating research and extension, frequent reshuffling and changes make it difficult for these mechanisms to work properly.

Mind-sets and Capabilities

Capacity is a major issue within the extension system; many DAs and experts have low technical capacity and morale. The DA position suffers from high turnover (Gebremedhin, Hoekstra, and Tegegne 2006).

The agricultural education system is also constrained by a shortage of experienced and qualified teachers (some ATVET instructors had to be hired from outside Ethiopia) (Kassa 2004a). The training institutes also suffer from brain drain and a lack of finances, equipment, and facilities. Kassa (2004b) also

noted that higher education institutes in Ethiopian agriculture have irrelevant curricula and are unable to respond to the labor market.

Agricultural education and training institutes such as the ATVETs are conventionally viewed as a means for building human and scientific capital, but it is important to recognize that this training also has a vital role in building the capacity of organizations and individuals to transmit and adapt to new applications of existing information, new products and processes, and new organizational cultures and behaviors. It is thus important to improve training systems by strengthening the innovative capabilities of organizations and professionals; changing organizational cultures, behaviors, and incentives; and building innovation networks and linkages (Davis et al. 2007; Spielman, Davis, et al. 2008).

DAs and other extension staff appear to have limited skills relating to innovation, networking, social learning, policies, farmer group development, and negotiation (Abate 2007; Aberra and Teshome 2009). The DA training should focus on communication for innovation, not just technology transfer (Abate 2007). Capacity is also lacking among DAs, extension administrators, and bureau heads to effectively participate in priority setting, planning, and evaluation of extension programs.

Similarly, among extension clientele, both male and female farmers are in need of business, management, and analytical skills in addition to technical skills, but this is not currently part of extension outreach. Most of all, the farmers in Ethiopia need to be able to make decisions, voice demand, and play a part in developing extension's priorities and evaluating its outcomes—in short, they need empowerment.

There appears to be a mind-set among extension and research staff that by adopting new technologies, farmers will become instant commercial farmers. But this is not enough; farmers also need new skills that go beyond the technical, such as those for business, management, and analysis (Ashworth 2005; Kassa 2002).

Another problem has been the use of DAs for nonextension activities (EEA/EEPRI 2006; Kassa 2002). This includes the distribution of fertilizer, the collection of credit and taxes, and other government activities that do not typically fall under the mandate of extension.

Although there have been complaints in the past that the extension coverage or the number of total agents in the country is inadequate (Kassa and Abebaw 2004; Kassa 2002), this no longer seems to be the case, with the assignment of three DAs to every *kebele*. Complaints or issues are more likely to center around the quality of DAs rather than the quantity.

Infrastructure and Resources

Researchers agree that the FTC should be the focal point for all the actors within the innovation system (Abate 2007). However, the FTCs need monitoring and support (Aberra and Teshome 2009). This is in addition to having a clear business or operational strategy and knowledgeable DAs who are capable of running them.

Because FTCs are relatively new, there is very little mention of them in the literature to date. This is also true for the ATVETs, which began training DAs only about five years ago, and thus there is not much information on how the ATVETs operate.

Enabling Environment

Extension must be backed up by enabling policies (FAO 2008a, 2008b). However, these policies are often formulated and implemented without due regard to farmers' opinions (Kassa 2002). Policies and programs are needed that go beyond technological innovation to encourage institutional innovation and that strengthen the innovative capabilities of government agricultural staff and farmers (Spielman, Davis, et al. 2008). In some cases, the state, through its policies, may be crowding out other innovation actors who could play a role. Thus, policies on science and technology, and business and investment, are needed that provide incentives to bring about development in rural areas (Spielman et al. 2006).

With regard to the enabling environment, distribution channels and institutions are flawed. The formal seed system is very weak, there is a lack of input and output markets, and there are bottlenecks in the transport system (EEA/EEPRI 2006). Many of the constraints to the adoption of improved agricultural

technologies are related to the lack of inputs or their high prices and late delivery (Kassa and Abebaw 2004).

Other major constraints that affect extension indirectly are the high cost of inputs, a lack of inputs, late delivery of inputs, weak seed systems, transportation problems with the input system, monopolies on input markets, and a lack of communication and information sharing within the extension line departments from the federal to the *kebele* levels. Linkages are poor between research and extension and within the extension line ministries from the federal to the *kebele* levels. Extension at times has also focused excessively on production, leaving out critical sectors such as marketing, to the detriment of small-scale maize farmers who experienced a price collapse in 2001/02 as a result of overproduction.

However, there are some positive steps taking place. One is the use of information and communication technology (ICT) in agriculture, and another is the setting up of marketing and credit institutions. Another innovation is the institution of the Ethiopia Commodity Exchange (ECX) in 2008 (FAO 2008a, 2008b). The ECX is a completely electronic system that plans to market cereals, coffee, sesame, and other crops. Currently, it has started its operations with the marketing of coffee and sesame.

Institutional Environment

Various actors and institutions play important roles in Ethiopia's extension system. Major government ministries concerned with or affecting agricultural and rural development include the following:

- **The MOARD**

The MOARD is responsible for developing and refining the overall national agricultural and rural development strategies and policies for the country, with input from the regions and other stakeholders. Within this strategy, the MOARD establishes the overall national extension policy, providing financial support for the extension system and supporting the regions with training and other capacity-strengthening activities.

Several agencies sit beneath the MOARD:

- **The Agricultural Marketing and Inputs Sector, the Natural Resources Sector, and the Agricultural Development Sector**

In turn, the Agricultural Extension Department and the Training and Vocational Education Department fall under the Agricultural Development Sector.

- **The semiautonomous EIAR, which has the mandate to generate, develop, and adapt agricultural technologies that focus on the overall development and needs of users (Beintema and Solomon 2003)**

EIAR is responsible for the coordination of decentralized agricultural research activities at federal and regional research centers, and through higher education institutions, including 7 regional and 15 federal agricultural research institutes (Beintema and Solomon 2003; Spielman et al. 2007). It operates at the federal and regional levels and accounts for two-thirds of total spending and staff (Beintema and Solomon 2003). The EIAR is one of several institutes conducting agricultural research; in the late 1990s there were 41 agencies engaged in research (Beintema and Solomon 2003).

- **Other ministries, such as the Ministry of Trade and Industry, the Ministry of Capacity Building (<http://www.mcb.gov.et>), the Ministry of Education, the Ministry of Health, and the Ministry of Transport and Communications**

All finances are handled by the Ministry of Finance and Economic Development (<http://www.mofed.gov.et/>).

- **The Food Security Coordination Bureau (FSCB)**

Another important rural institution, the FSCB classifies all *woredas* in Ethiopia into two categories based on food security status, as food secure or food insecure, due to the chronic problems of food security in the country. The Productive Safety Net Program, one of the

largest social protection programs in Sub-Saharan Africa (SSA), works with the chronically food-insecure *woredas* (Gilligan, Hoddinot, and Taffesse 2008).

- **Regional, *woreda*, and *kebele* institutions:**
 - Each region has a BOARD. The regions and their BOARDS are responsible for agricultural and rural development policy implementation, coordination, and evaluation. Each BOARD has a head and a number of technical and administrative staff, including department heads. These personnel provide technical and administrative support, as well as supervision and monitoring for the *woreda*- and *kebele*-level extension offices. Each region's agricultural advisory support is internally divided according to major agroecological zones, providing more detailed technical and administrative support, especially for the large regions. Some regions, such as SNNPR, which has many different languages and ethnic groups, use zonal administration more than others.
 - Under the regions are zonal offices, which mainly operate as liaison offices between regions and *woredas*. However, the *woreda* Offices of Agriculture and Rural Development (OOARDs) are the main frontline administrative structures implementing agricultural extension. The OOARDs are composed of five main sectors: agricultural development, natural resources, environmental protection and land administration, water supply and rural roads, and input supply and cooperative promotion (Gebremedhin, Hoekstra, and Tegegne 2006). The largest sector, agricultural development, is responsible for extension services and is usually divided into crop production, livestock production, NRM, and extension teams (Gebremedhin, Hoekstra, and Tegegne 2006). The OOARD represents a more operational level in terms of reaching smallholder farmers and pastoralists. They do so using a cadre of experts or SMSs (who are also found at the regional level).
 - At the *kebele* level are the FTCs, at which are posted three DAs.
- **Other institutions at the *woreda* and *kebele* level**

These include farmers' cooperatives for input supply or marketing, community-based organizations, NGOs, private firms (such as traders or transporters), and microfinance institutions (MFIs).

Other Actors Influencing Extension in Ethiopia

In the private sector, domestic and foreign firms, small-scale rural entrepreneurs, traders, transporters, and industry associations are emerging as a potentially important force in the country. Private investment as a percentage of GDP in Ethiopia has risen significantly, as has domestic lending to the private sector. Between 1992 and 2004, 614 domestic firms and 23 foreign firms invested approximately US\$310 million in the agricultural sector (Spielman et al. 2006).

Cooperatives and unions provide a wide variety of services, including input supply management, grain marketing, and the supply of consumer goods to members at prices that compete with local traders (Spielman et al. 2006). Some cooperatives are also involved in seed multiplication and distribution schemes, grain milling, distribution of veterinary medicines, and training of members in fields such as paraveterinary services for cooperatives' veterinary clinics (Rahmato 2002). Farmer cooperatives in Ethiopia have found a clear niche in the production of high-value export crops such as coffee. At present, cooperative membership is estimated at approximately 4.5 million (ACDI/VOCA 2005).

Traditional, informal organizations at the community level include funeral groups (*idir*), work or labor sharing groups (*jigie*), and savings and loan-type groups (*iquob*). These groups provide linkages to outside actors and serve as a mechanism for information sharing (Spielman et al. 2006). In addition, individual innovative farmers are an important component of the innovation system.

A motivating force behind the growth of community-based development organizations is the efforts of NGOs to promote human capital development and social capital formation at the local level. NGOs are an important feature of Ethiopia's agricultural innovation system. Although their activities were generally limited to famine relief in the 1970s and 1980s, many are now investing heavily in sustainable agriculture and rural development. Their comparative advantage lies in their ability to reach poor and marginalized people, and in their operational flexibility and dynamism. NGOs operate at all levels of in Ethiopia: national, regional, zonal, *woreda*, and *kebele*. In many rural areas, their work is planned and implemented in consultation or collaboration with the regional agricultural bureaus or agricultural development offices at the *woreda* level. They also play a role in microfinance, lending money for small-scale agricultural enterprises such as fattening (Spielman et al. 2006).

State of Extension Inputs and Resources Today

From the data and the authors' findings, the GOE appears committed to developing the largest agricultural extension system in SSA. Currently, there are about 8,489 FTCs established at the *kebele* level, with roughly 2,500 of these FTCs reported to be fully functional at the present time (Ethiopia, MOARD 2009a). In addition, there are about 45,000 DAs currently on duty at the *kebele* level, of whom about 12 to 22 percent are women, depending on the region (Ethiopia, MOARD 2009a). The number of frontline extension personnel is expected to increase to roughly 60,000 when all FTCs have been established and are fully functional. About 62,764 DAs have graduated from the ATVETs as of 2008, with 12 percent of them being female (Ethiopia, MOARD 2009b). This overall total for DAs trained compared to DAs currently serving (45,000) indicates that some ATVET graduates have left the extension system since graduating from the ATVET system.

The vast majority of currently employed DAs are located in four regions: Oromiya (19,654), SNNPR (11,061), Amhara (10,196), and Tigray (2,067).³ As shown in Table 1, the other regions have a limited number of functional FTCs and DAs. The column "FTCs required" refers to the number of FTCs that should be in that region, based on the number of *kebeles* in the region. For instance, in Tigray, there should be 602 FTCs since there are 602 *kebeles*, and the plan is to establish an FTC in every *kebele*. Harari, a small, mostly urban region, has only 17 *kebeles*.

The column entitled "Established FTCs" is the number that, according to the MOARD, has already been established countrywide. However, note that there is a difference between "established" and "functional" FTCs. Established FTCs are those that have a building and DAs in place. However, they are not functional until they have started one component of training—either demonstration or training. The training may be modular training or may be short-term, based on demand.

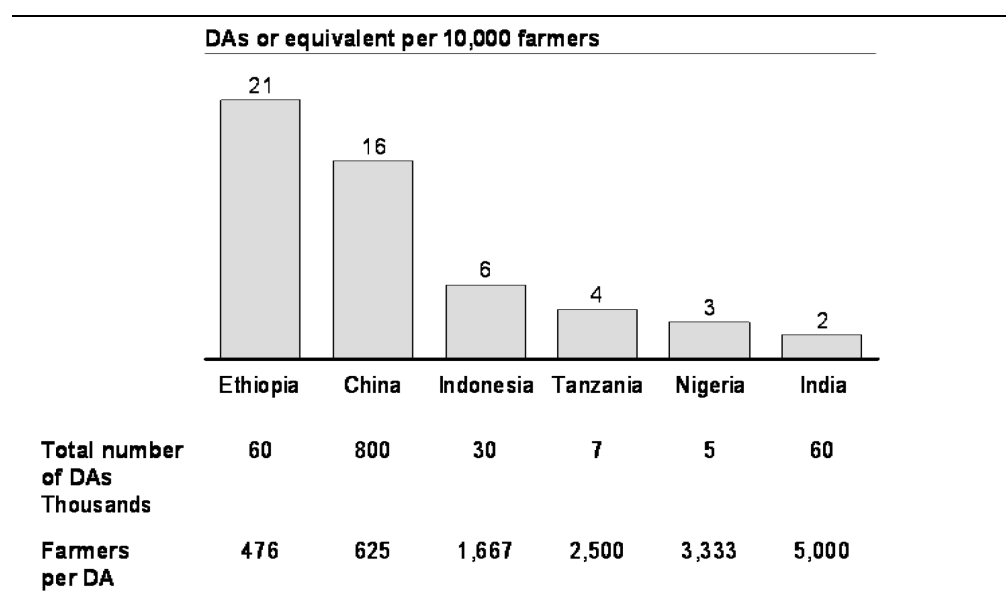
³ Source: Ethiopia MOARD (2009a)

Table 1. Estimated number of FTCs and DAs in Ethiopia

Region	FTCs			DAs		
	FTCs required	Established FTCs	Functional FTCs	Male DAs	Female DAs	Total DAs
Tigray	602	588	55	1,879	188	2,067
Oromiya	6,420	2,549	1,147	?	?	19,654
Amhara	3,150	1,725	318	7,532	2,664	10,196
SNNPR	3,681	1,610	857	9,707	1,266	11,061
Afar	558	3	?	?	?	748
Somali	?	2	?	1,167	102	1,269
Harari	17	5	?	47	5	52
Dire Dawa	25	7	?	73	15	88
Benishangul-Gumuz	?	?	?	?	?	677
Total known	At least 14,455	At least 6,489	At least 2,384	At least 20,405	At least 4,240	45,812

Source: Ethiopia MOARD (2009a) .

Given that there are approximately 21.8 million adults (ages 15–65) who are active in agriculture, it is estimated that when the extension system reaches its goal of 60,000 DAs placed in the field, there will be roughly 1 DA for every 476 farmers. This would then be one of the strongest extension agent–farmer ratios found in the world today (see Figure 3).

Figure 3. Comparative extension investment in select developing countries

Source: Authors.

Note: DA = development agent.

Extension resources also exist at the *woreda* level. There are more than 700 urban and rural *woredas* (districts) in Ethiopia. There are, on average, about 30 or so agricultural officers in nine divisions or units within each *woreda* agriculture office, including (on average) about 10 or more SMSs who are expected to provide technical support and training to the DA staff at the *kebele* level. Most of these SMSs are assigned across the same technical areas as the DA staff, that is, crops, livestock, and NRM. In the past, most of the staff assigned to these SMS positions had begun their extension careers at least 5 to 10 years earlier.

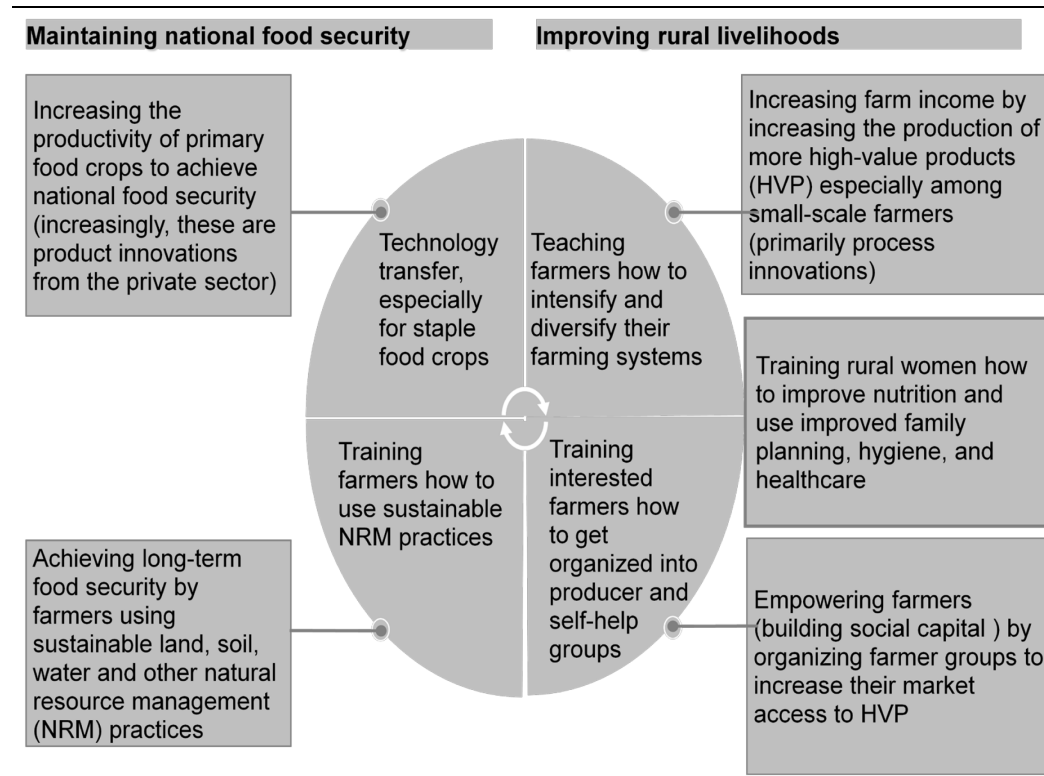
Alternative Approaches to Extension Worldwide and Lessons for Ethiopia

There is no “best practice” that can be taken from one country or region and implanted elsewhere without regard to the local conditions. Ethiopia is a very diverse country, and there is a need to go beyond “one size fits all” solutions. Every extension system, including the structure and approach, must be evaluated in terms of where it will be used and who will use it. There are four conditions that should be examined to determine best-fit solutions: the policy environment; the capacity of (potential) extension service providers; the type of farming systems and the market access of farm households; and the nature of the local communities, including their ability to cooperate (Birner et al. 2006).

There have been many evaluations of different extension models and approaches in Ethiopia, Africa, and worldwide (for example, Anderson 2007; Davis 2008; Alex et al. 2002; Singh, Swanson, and Singh 2006). In addition, alternative methods and approaches have been tried in Ethiopia (for a detailed review, see Abate 2007). For example, some organizations are using farmer research groups (FRGs) and farmer research extension groups (FREGs) to identify appropriate technologies that are the most suitable for farmers in different *woredas* or agroecological zones. The Japan International Cooperation Agency (JICA) is partnering with agricultural research centers at the federal and regional levels and has used FRGs in Oromiya Region to improve technology generation, development, verification, and transfer. An important goal is to increase farmer participation in research. These JICA-funded FRG projects have also begun to experiment with other extension approaches such as farmer field schools, as well as techniques such as the use of mobile phones to obtain market information. In SNNPR, the NGO FARM-Africa’s Institutionalization of Participatory Extension project also used FRGs, as did the Agricultural Research Training Project by the World Bank. Agri-Service Ethiopia (ASE) uses a community-based institution approach: “A rural people-centered nonpartisan, not for profit, voluntary, free and multipurpose self-help community development association/institution” (Abate 2007: 69).

In reviewing alternative extension approaches, the authors also considered lessons from other countries that could inform the assessment. Figure 4 illustrates how selected Asian countries (such as China, India, and Indonesia) have transformed their respective agricultural extension systems to become more comprehensive and innovative during periods of rapid economic growth. As illustrated in this figure, extension systems need to expand beyond “technology transfer” for the major food crops to achieve short-term national food security. As developing countries achieve rapid economic growth (for example, 8 percent GDP growth in Ethiopia during 2008), consumption patterns begin to move toward more high-value crops (such as fruits, vegetables, spices), livestock (for example, meat, milk, eggs), and other products (for example, honey, silk). This transformation in both domestic and global market demand provides many new economic opportunities, especially for small-scale and women farmers, to increase farm income.

Figure 4. Key functions of extension system seeking to achieve both national food security and improve rural livelihoods



Source: Swanson (2009).

However, in pursuing these new high-value crop and livestock products, farmers must organize into producer groups so they can efficiently link to these growing market chains. In the process, and with additional farm household income, rural women begin to improve family nutrition, hygiene, and healthcare, especially for their children.

The other key area where Ethiopia is making good progress is in training farmers how to use sustainable NRM practices. Since most NRM practices require further investments (both labor and capital), increasing farm income becomes a critical factor to enable farmers to make these needed investments. As shown in Figure 4, a comprehensive extension system must focus on all four of these closely integrated functions to both achieve national food security and improve rural livelihoods.

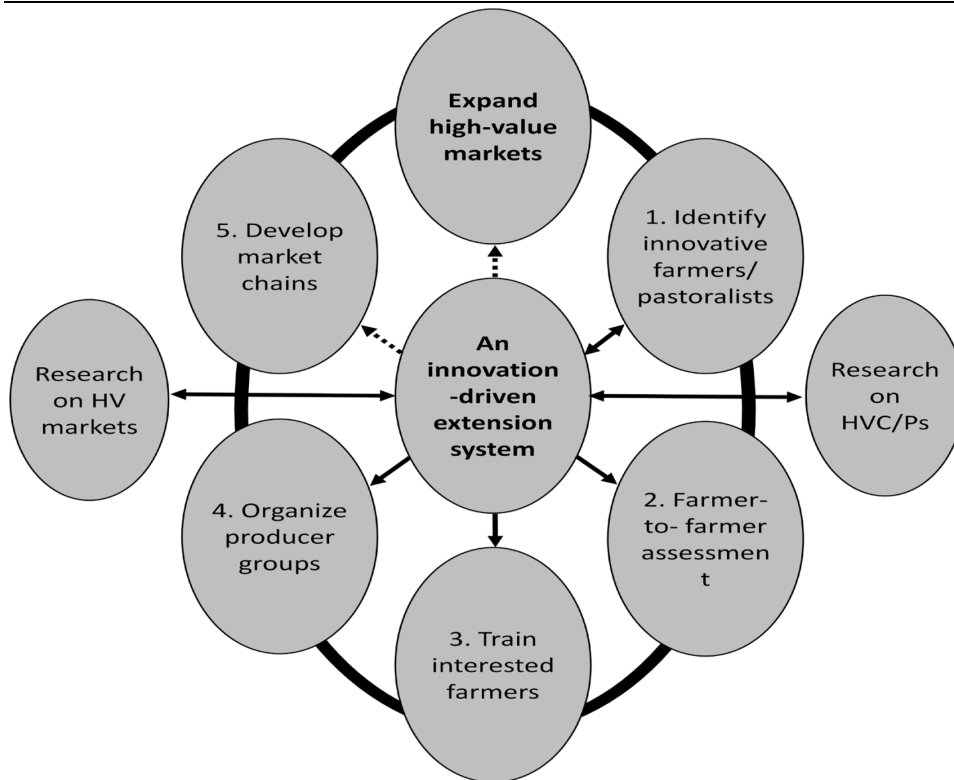
Role of Innovation in Extension

Innovative farmers play a key role in innovating by demonstrating how to intensify and/or diversify current farming systems. These farmers are often very successful; in Ethiopia, some have become “farmer millionaires.” These innovative farmers can play a strategic role grounded in their interest in pursuing new high-value crops, livestock, or other enterprises to increase their farm income. They do this first by assessing emerging markets for these new crops or products vis-à-vis their specific agroecological conditions, land, and labor resources, as well as their access to these markets. Second, on a small-scale trial basis, they attempt to successfully produce and market these crops or products. Once successful, they begin to scale up their own production. In some extension systems, these innovative farmers are considered for appointment to local “farmer professor” roles—where they share and disseminate their learnings and promote the scale-up of the successful innovations across farming communities.

Many small-scale farmers within these communities are aware that innovative farmers are trying something new, but few are willing to learn more about these new enterprises or are able to handle the potential risk unless markets exist to absorb the different crops and products. As markets expand for these crops and products, many of these enterprises become scalable.⁴ Here, as shown in Figure 5, is where an innovative extension system can first identify these innovative farmers and their respective enterprises, and then begin the process of engaging other farmers in scaling up the enterprises among different groups of farmers, given land and labor availability, gender of the farmer, and farmer interest.

⁴ For example, in one district (*woreda*) in India, in just over three years, a market-driven extension system introduced more than 30 different high-value crops, livestock types, and other enterprises that resulted in more than 750 producer groups being organized and linked to markets. For more information on creating a more market-driven extension system, see Singh, Swanson, and Singh (2006), Swanson (2006a), and Swanson (2007).

Figure 5. Moving toward an innovation-driven extension system to increase income



Source: Swanson (2009).

Note: HV = high-value; HVC/Ps = high-value crops/products.

In most rural communities, small-scale and women farmers are generally unaware of these emerging markets, but once they learn more, especially through farmer-to-farmer assessment, they are soon ready to learn how to produce and market these products on a small-scale basis to minimize household risk. Again, innovative farmers and “farmer professors” can play a strategic role in this process by helping extension organize these interested farmers into producer groups so they can begin working together to produce and market these crops and products. These start-up producer groups usually begin by supplying local markets, but as they gain experience and expand their production, they begin serving larger urban markets (meaning developing value chains) and, in some cases, global markets.

While the field-level extension staff can facilitate this process, they need strong back-up support from research and the private sector because in most cases even innovative farmers do not have the most up-to-date information and technology relating to these crops or products. The key linkage mechanism in helping DAs gain access to this information and technology is the SMSs at the *woreda* level. First, however, they need to become aware of these emerging markets and then to learn more about how to produce and market these crops and products. In addition, as they become aware of these emerging enterprises, the SMSs can facilitate the training of the DA staff (by research staff and/or the private sector) and then help the local producer groups link together into *woreda*-level producer associations that can eventually supply larger urban markets. Finance also plays a critical role at this stage of development. As more farmers become interested in the new opportunities, finance can act as a catalyst to growth by providing new farmers with the capital required to participate in new market opportunities.

4. RESULTS AT FIELD LEVEL

In this section, the strengths and constraints of the current Ethiopian agricultural extension system are assessed, and specific recommendations to improve the extension system are described. The authors start with the front line of extension at the *kebele* level, analyzing resources and infrastructure at the FTCs, the mind-sets and capabilities of extension agents, and the management and systems that apply at this level. The authors then assess the supporting extension structures at the *woreda* level, and finally conclude with a review of the policy environment at the regional and federal levels.

Kebele Level

Infrastructure and Resources

Strengths

Over the past years, the GOE has invested substantially in the infrastructure and resources required to create a strong agricultural field extension presence, and it is committed to further expanding this so it can become one of the most intensive systems in the world. The plan is to ultimately establish an FTC in each *kebele*. The FTC should include an office/classroom building, housing for the DA staff, livestock buildings, wells, fencing, demonstration farms (DFs), and other needed facilities. The *kebele* will typically allocate 1.0 to 2.5 hectares of community land to the FTC, land that can be used to demonstrate and train farmers on new technologies, farming systems, crops, livestock, or other enterprises.

The physical development of about 8,500 FTCs has been under way since 2004; about 2,500 FTCs have been strengthened with financial support from the World Bank RCBP. FTCs are at different levels of development, based on local *kebele* government and community commitment as well as the availability of government/donor resources to cover capital expenditures (for example, building materials, equipment, animals) and operating cost (such as seeds, fertilizers). In most *kebeles*, the local farmers provide the necessary labor for constructing the buildings, since they have an interest in developing effective FTCs. The GOE has also invested substantially in training and hiring DAs, as discussed in the mind-sets and capabilities section below. Overall, this is a strong asset base that Ethiopia can build on. This opens the opportunity to establish a truly world-class extension service over the next five years.

Constraints

However, the study team observed serious constraints in the actual infrastructure and resource levels in most FTCs, even those supported by donor programs. As detailed below, the lack of seed financing and operating funds to invest in basic training infrastructure and to turn the DFs into teaching/learning plots that are at least partially economically sustainable drastically reduces the effectiveness of the FTCs.

The FTC infrastructure and resource levels differ substantially across the country (Table 1). Many of the better-developed FTCs were donor-financed; however, even within regions and *woredas* there was considerable difference between, for example, RCBP-supported FTCs. Many FTCs visited by the authors had a standard classroom and office space for the DA staff. However, there was considerable variability in the quality of these buildings, depending both on donor financing and on local commitment in building a permanent classroom/office building. Some FTC buildings were poorly constructed and will require continuing maintenance to keep them functional. Most FTCs do not have access to electricity, and therefore only a few have TVs with DVD players and almost none have any other type of advanced teaching equipment (for example, overhead projectors, screens, computers). In fact, some do not have any teaching materials at all. FTCs also have few independent learning materials (for example, training materials or manuals) that farmers can use for independent learning and support.

Many FTC DFs visited by the authors had not been developed or used. While most *kebeles* have allocated 1.0 to 2.5 hectares to each FTC, most FTCs have neither the resources nor the expertise needed to transform this land into an effective teaching/learning tool. In some FTCs visited by the authors, the

DAs had used only a small portion or none of the farm to demonstrate specific crops or production techniques. In discussions with local farmers, they noted that FTCs (even those run by RCBP that are more developed) are often poorly managed. While the most advanced may have become effective technical “demonstration” farms, they were usually not viewed by the DA staff as potential revenue centers that could demonstrate the economic attractiveness of the activities to farmers and could contribute to the operating funds of these FTCs. The DFs have great potential to be run as effective revenue-generating teaching tools to demonstrate to different types of farmers how they can increase their farm household income. However, the constraints mentioned prevent this in many cases.

The lack of adequate operating funds for nearly all FTCs visited is a major and continuing constraint that substantially reduces the extension and training programs at each FTC. Operating resources are the most vulnerable line item in extension budgets and may be reduced first when budgets need to be cut. However, if these DFs can serve as effective teaching/demonstration centers and at the same time generate sufficient funding to create FTCs that are more sustainable, then these centers can serve the long-term needs of farmers within each *kebele* without being a burden on the *woreda*'s budget (excluding DA salaries). Of course, this revenue-generation goal should not disproportionately shift resources away from the primary extension activities that are most critical to increasing farm household income, nor take the DAs' focus off their primary goal of serving the needs of farm households, including farm women and rural youth. This risk must be mitigated by careful oversight of the FTC and DA activity by both *woreda*-level extension staff and the FTC management committee. Examples in Ethiopia show that revenue generation and training are not in conflict with each other, but rather represent a win-win in terms of financing and demonstration.

For instance, sustainable “model FTCs” are already demonstrating the impact that farmer-driven, market-oriented approaches can have in extension. At an FTC that the authors visited in Tigray, the senior DA is showing farmers how to run the DF like a business, buying and selling different products to farmers (such as improved breeds of sheep, beehives, chicks) and local markets (fruit, vegetables, and milk) and then using these revenues to finance ongoing extension and training activities. In addition, the success of this FTC has resulted in the further development of its training facilities, with local farmers donating their time, rocks, and other building materials to actually construct the facilities. This FTC is being used by both Tigray Region and Atsibi *woreda* extension directors to both demonstrate and train DAs from other *kebeles* and *woredas* within the region. The DAs learn how they can develop and use their FTC DFs for the hands-on training of local farmers and rural youth as well as a revenue-generating unit to finance all future FTC operating costs.

The FTC is introducing many technical and market-driven innovations to farmers, such as “zero grazing,” which accelerates the fattening of both cattle and sheep and then allows for the efficient collection and use of manure for both organic fertilizer and cooking fuel. For example, in 2007 the FTC took an 8,000-birr loan to purchase a cow that then generated about 10,000 birr in milk sales during the past year. In addition, the FTC has 15 sheep (improved breed, 14 ewes and 1 stud) and is now selling lambs on credit to local farmers.

On the DF, DAs are training farmers on commercial fruit and vegetable production, including drip irrigation, which was purchased for 950 birr, on credit. For example, in 2008 the FTC produced three crops of tomatoes that generated about 10,000 birr in revenue. In addition, these DAs are training landless youth and women in other enterprises, such as beekeeping and poultry production. For example, the FTC had procured 100 modern beehives that were being distributed to rural households on a microcredit basis. In addition, the FTC has 20 hens to produce eggs for local markets. During 2008, the total operating costs of the DF were about 16,000 birr (all on microcredit from the local cooperative), resulting in net revenues of 7,000–8,000 birr. The senior DA expected a significant increase in earnings during 2009.

Only a few FTCs that have received sufficient government or donor support provide DAs with a suitable place to live at or near the FTC. Farmers interviewed noted that in some cases it is difficult to see the DAs because they are so far away and do not have transport. Most often, DAs must find a local family within the *kebele* who will rent them a small room at a small cost or, more frequently, they must find and rent a suitable room in the *woreda* or another nearby town. If this latter option is pursued, then it was

reported that most DAs do not make daily trips to their assigned FTC, since most DAs also do not have any type of transportation (meaning a bicycle) and it may take them two or more hours to walk to the FTC and then to return home each evening. The housing issue becomes an increasingly important constraint when the DAs marry and start having children. Some DAs have bicycles (RCBP-financed) so they can more easily visit farmers in their local villages within their *kebele*. In most other FTCs, which have not received sufficient government or donor support, the DAs do not have bicycles or any other suitable form of transportation.

An additional issue routinely raised by the DA staff is that they thought they should have appropriate field wear to wear, especially when conducting extension activities such as farmer field days or when making field visits to local communities. DAs also reported that there are no means or budgets for communication, which limits their ability to, for example, obtain market information or access remote resources for technical questions. In brief, shortfalls in housing, transportation, equipment, and communication represent serious constraints that limit the time DAs spend in local communities working with farmers and, in the future, will limit the time spent with producer groups that will need their continuing support.

Recommendations

Basic Training Infrastructure

The authors recommend that higher-quality classroom buildings be constructed and equipped for basic operational effectiveness. These would have the advantage of not only serving as a functional farmer learning center but could also serve as a community learning center (such as for health extension) for each *kebele*. Some of the essential equipment and infrastructure needed at each FTC includes desks and chairs for the DA staff, as well as one or more tables and about 50 chairs for the classroom. Since most teaching equipment (overhead projectors, a TV with a DVD player) depends on the availability of electricity, it is unlikely that much teaching equipment requiring electricity will be usable in most FTCs over the short term. Therefore, a high-quality chalkboard and written training materials should be provided to all FTCs. Eventually, *kebeles* need to be linked to the *woreda* and the rest of the country via *woreda*- and *kebele*-net. Farmers mentioned that each FTC should have electricity, TVs, and videos, so they can more effectively teach courses on different high-value crops and products.

Revenue-generating DFs

As the system evolves, DFs should be operated and managed as economically efficient enterprises that demonstrate the primary farming systems (and their economic viability) demanded within the *kebele*. In order to achieve this goal, both the management of the FTC and the resourcing demands of the DF must be addressed. While different management structures can be tested, the authors recommend that the senior or head DA within the FTC be responsible for managing the DF. This head DA will be responsible for the planning and revenue-generating activities of the FTC and will then work with the FTC management committee to determine what activities to pursue and how any revenues generated by the DF should be spent. There are legal precedents for how this can be managed with respect to the national budgeting frameworks, for example, in the schools system.

Some initial resources should be considered to strengthen and better equip the DFs in line with local demand. Examples include the following:

- Suitable livestock buildings and farming equipment for the types of crops and livestock typically grown or raised by progressive farmers in each *woreda*, such as a poultry shed for about 20–30 layers and 50 or more broilers; a suitable livestock building for 1–3 dairy animals, plus 12–15 improved breeds of sheep grown under zero-grazing methods; and, possibly, an open building or shed for modern beehives. In addition, each FTC should have one or more storage buildings and/or sheds for storing forage, grain, and other foodstuffs that

are produced on the DF, prior to these products either being consumed by farm animals or sold in local markets.

- A suitable deep well or water catchment pond that can provide irrigation water during the dry season. The purpose will be to demonstrate efficient water-use management practices in producing various high-value crops (and livestock products), especially during the dry season. Also, suitable pumping equipment will be needed, such as a rope or pedal pump, in areas with relatively shallow wells (for example, under 20 or under 8 meters).

Necessary Loans and Other Investments for Start-up Funding

Each FTC will need initial start-up funding to successfully launch the DF and to make the FTC more financially sustainable over the long term. This should include not only the purchase of livestock but also sufficient operating funds to cover seed, fertilizer, labor, and other operating costs during the first two years of operation. The reason for including operating costs through the second year is that mistakes will likely be made by relatively inexperienced DAs during the first year of operations; therefore, there should be sufficient resources to ensure that these DFs are fully functional and generating sufficient revenues during the second year to achieve financial sustainability by the beginning of year three. An illustrative list follows that identifies potential investments and purchases for the FTC; this list will vary by FTC, depending on the needs of the farmers.

- Purchase of suitable farming equipment, such as a bullock plow, wagon, and other cultivation and pest management equipment, as well as livestock handling/treatment equipment
- Purchase of 1–3 dairy cows, plus 12–15 sheep (improved breed) to initiate the zero-grazing livestock operation
- Purchase of 20–50 layers and at least 50–100 chicks to initiate the broiler operation
- Purchase of two bullocks both for plowing and for use in moving grain and forage products from the DF to storage and/or to the market
- Purchase of three or more modern beehives, with colonies
- Purchase of improved or hybrid seed for staple food crops, plus the vegetable seed and fruit seedlings needed to develop a diversified farming system
- Funding for fertilizer and other production inputs (such as pesticides) during the first two years of operation
- Hiring of at least three full-time (landless) farm laborers for the first two years of operation, including one woman specifically assigned to handle the poultry and the vegetable and fruit demonstrations

Note that after the second year, labor and operational costs (such as seed, fertilizer) will be subsidized from the revenues being generated by these DFs, which should be demonstrating all the recommended practices. There will necessarily be a role for government funding while the FTCs evolve toward this capability. The authors recommend that consideration be given to providing initial seed funding as a loan (with favorable conditions), not a grant. This is important both to contain system costs and to show farmers that it is worth taking up a loan to invest in these activities. As the authors witnessed in the case of the Atsibi FTC, the ultimate revenue-generating potential of the assets will enable the FTC to pay back the loans. Making investment decisions, and taking up and paying back loans, is an essential part of demonstration.

Housing, Field Wear, Transport, and Communication

All FTCs should have adequate housing available for their DA staff, and all DAs should be required to live in their FTC housing and to keep regular hours at the FTC or in carrying out their field assignments within the *kebele*. The housing should include simple furniture (such as a bed, table, chairs) for each unit.

Some means of transportation should be provided for DAs so they can effectively visit the farm and pastoral households being served. In most cases, the transportation problem can be resolved with strong bicycles that can handle rough roads and paths, but regions and *woredas* will need to determine the appropriate means of transport (considering, among others, horses, mules, camels, and motorbikes, on a cost–benefit basis). Incentives should be put in place to invest in the maintenance of transport and other hardware. Also, where possible, *woredas* should consider providing adequate field wear to DAs. When DAs gain access to these facilities and equipment, they should sign an agreement that the furniture and transportation equipment belong to the FTC and cannot be removed if they transfer or resign their position. Most DAs have mobile phones, which can be used to communicate for professional purposes if a modest budget is provided and safeguards against private use are put in place.

Mind-sets and Capabilities (Human Resources)

Strengths

The number of DAs has expanded rapidly over the past five to six years and now exceeds 45,000 employed in government services. However, at least as important as the number of DAs are their capabilities and their mind-sets, which jointly determine their behavior at work. The vast majority of the DA extension workers have the basic technical expertise and theoretical knowledge. When the official training schedule is followed, a DA receives 70 percent of his or her three-year basic education through practical training.

Farmers interviewed were demanding specific skills from DAs; they noted the need for training and technical assistance as they rapidly move into the production of high-value crop and livestock enterprises. Some farmers noted that DAs lacked the necessary practical experience and expertise to teach these skills. One example of a step in the right direction with this regard is the RCBP, which has developed training modules for about 12 different high-value crops and livestock enterprises.

Moreover, the researchers observed selected DAs who were exceptionally entrepreneurial, motivated, and capable technically, but also proficient in the “soft” skills required to work with farmers in a participatory way. The impact that DAs with such mind-sets and capabilities can have is illustrated above with the Atsibi FTC. Based on the initiative of three young DAs, an empty building on a plot of land has been developed into an impressive training center that offers a broad range of integrated crop, livestock, and NRM demonstrations. Furthermore, the FTC generates sufficient income to cover all operating expenses and further capital expenditures to continue to expand activities. Examples like this can serve as a model and source of inspiration for scaling up effective practices in Ethiopia.

The DA career offers certain benefits. Within the system, there are more than 10 different salary levels. The DA entry level for diploma holders is typically three levels above what other diploma holders would receive. The entry-level monthly salary for any diploma holder should be 861 birr, but the initial salary for some DAs, according to sources, is 928 birr (three levels above entry level), and can go up 2,800 birr.

In addition, there is an annual nationwide farmer award program for farmers, DAs, and sometimes researchers. In this program, the most innovative farmers and best-performing DAs are recognized at the national level for their performance. Top-performing farmers and DAs are also selected at all the other levels; the top ones from each level go to the next level until they reach the nationwide award program.

The extension staff evaluation system has also been strengthened with more community input in recent years. DAs are typically evaluated at the *woreda* level. The new evaluation (launched last year) gives 60 percent of evaluation say to the community and 40 percent to supervisors. Staff are evaluated on the execution of planned activities, on the approach, and by the subjective evaluation of the community and *kebele* council. The *woreda* evaluates performance and impact. There is also the opportunity (albeit limited) for DAs to upgrade their education level. The top 5 percent of DAs (selected for the best performance) are allowed to upgrade to the BSc level.

Another important observation during the field visit is that farmers in all regions visited are ready and interested in finding ways to increase their agricultural productivity, as well as to intensify and diversify their farming systems. Innovative and progressive farmers are already using more intensive production packages and, simultaneously, they are also changing their farming systems, including double-cropping and beginning to produce different high-value crop and livestock products. Most farmers whom the authors met with during the visit are ready for change and see the extension system as the primary source of information, training, and advisory services that can help them increase their farm household income (see also Bongor, Ayele, and Kuma 2004).

Constraints

There are serious constraints in the capabilities and mind-sets of most DAs: technical skills are rather narrow, and business skills and entrepreneurial mind-sets are rare. Furthermore, a “technology push” mind-set dominates, while knowledge of participatory methods and how to be responsive to farmers is rare. This is a function of both attitude and lack of facilitation skills. Limited career opportunities, frequent transitions, and the low recognition of DAs’ importance, in combination with low resource levels, reduce the motivation of DAs.

As pointed out in Section 3, agricultural extension systems must broaden their focus beyond just transferring technologies for the staple food crops. The extension system has been successful in developing a set of packages for production of cereal crops, including maize and wheat production. In some regions, additional packages have been developed and implemented at the FTC level to meet specific farmer and location demands: coffee packages, for example, have been produced and implemented in SNNPR. Package development must incorporate farmer needs and be region-specific, addressing the broad range of farmer needs.

In contrast to the use of diverse packages in select regions, many regions and the field-level extension workers often disseminate “standard” production practices for the major food crops across the entire region. As a result, these extension fieldworkers fail to promote a more balanced and expanded extension program that devotes increased attention to the intensification and diversification of farming systems. Farmers specifically report that package availability for FTC-level cropping systems is often very limited, and in most regions visited, only a few main packages (such as maize) were available for use.

At the same time, innovative and progressive farmers—even in regions with a more traditional extension strategy (that is, technology transfer)—are already using more intensive production packages and, simultaneously, they are also changing their farming systems to include practices such as double-cropping and the production of various high-value crop and livestock products. The problem is that extension fieldworkers have very limited skills concerning these emerging crops and livestock enterprises, and they are not being encouraged and supported in helping less-advanced farmers learn about these new crop and livestock enterprises. Assuming that Ethiopia’s strong economic growth will continue after the current economic crisis, it is expected that changing consumption patterns among urban consumers will offer important and expanding economic opportunities for small-scale and women farmers and pastoralists across most of Ethiopia. The majority of DAs currently have neither the capabilities nor the mind-sets to support this development.

This brings up the issue of extension systems for different clientele groups. Should there be different systems for women farmers, or for pastoralists? The authors take the view that when an extension system is bottom-up and truly participatory, the system itself will be flexible enough to reach different clientele groups. Therefore, there is no need for a completely separate extension system to reach pastoralists or women, but rather one that is able to understand the needs of special groups and to adapt to meet these needs. This also highlights the need for DAs to have many generalist skills (see discussion below), since they may not know what specific areas will be demanded by farmers and pastoralists.

Frontline extension workers must be prepared to work with and assist all types of farm and pastoral households, including rural young people, as these families seek out new enterprises and off-farm activities that can both increase household income and improve livelihoods (including better nutrition,

health, and hygiene practices). The field extension workers must be able to respond effectively to the emerging skill, knowledge, technology, and information demands of rural farm and pastoral households, especially as they work to intensify, diversify, and/or increase the productivity of their current and emerging farming systems, based on changing market demand, while using sustainable NRM practices.

The principle of specialization poses another constraint. The tension between general and specific skills is a common one in extension systems. Under the previous extension system (Participatory Demonstration and Extension Training System, or PADETS; see Bongor, Ayele, and Kuma 2004), frontline DAs were assigned and functioned as general agricultural extension agents, as is common in most countries. For the past six years, DAs have been trained and assigned as specialists (focusing on crops, livestock, or NRM). Even on FTC DFs, some DAs have decided to divide the land into three areas—crops, livestock, and NRM—rather than using an integrated farming systems approach. These examples illustrate a constraint in that the DAs are attempting to carry out extension programs from their own particular technical perspective while farmers themselves are seeking to diversify and intensify their farming systems within specific agroecological areas, which directly involves all three technical areas, plus farm management and marketing issues. Once on the job, these DAs must function as generalists, due both to farmer needs and current transportation constraints. For example, when a farmer approaches a DA, he or she has no idea that the DA is a “specialist” in a particular technical area; therefore, the farmer asks for advice on a broad range of questions and is disappointed if the DA cannot help him or her solve the particular problems or constraints. In addition, as the farming systems across Ethiopia continue to intensify and diversify, the extension staff will continue to need broader technical, farm management, marketing, and other professional skills so they can help farmers organize into producer groups and then help them link to specific markets for the expanding range of high-value crops and products.

Due to their age, lack of on-farm experience, and this narrower subject-matter focus, most DAs lack the practical, hands-on skills and knowledge needed to gain the confidence of farmers (see Section 5 for a discussion of the lack of practical training). In addition, these DAs also lack training in other key areas, such as intensifying or diversifying farming systems, agricultural marketing, and other communication and soft skills, such as how to organize producer groups.

Finally, it was reported that DA performance incentives are limited in some regions and many DAs seek alternative career opportunities due to low job satisfaction. As the DA program has developed, progress has been made in developing incentive programs for DAs, including university scholarships and regional and national DA rewards. These efforts represent a good initial step toward the creation of a DA incentive system. However, the lack of a clear professional career path that includes incentives, salary increases, awards, and/or other professional opportunities (for example, scholarships) for the extension field staff remains a major constraint. Some regions and *woredas* have implemented successful incentive programs including offering university scholarships and small increases in pay based on performance, but most have not implemented sufficient incentive structures. Interviewed DAs cite both a lack of incentives and a lack of clarity in reward system design as drivers of low job satisfaction. Opportunities for increasing education, named by DAs as one of the most appealing incentives, are often very limited, with most DAs feeling they have very little chance of ever being selected for one of the scholarships. Additional opportunities to enhance their expertise, improve their extension services to farmers, and move up professionally within the extension system are nonexistent in some regions and *woredas*. While official staffing policy indicates that DAs ought to be placed in their home *woredas*, DAs are sometimes transferred to regions where they have no connection. In some cases, DAs have been transferred to a different FTC after only six to nine months. This is detrimental to DA impact, as experience shows that it takes at least two to three years before a DA gains the respect, relationships, and location-specific expertise needed to add real value to farmer communities.

To diversify into new high-value crop and livestock enterprises, farmers need to learn new farm management skills that are best taught through experiential learning (see Kahan 2007). In India, frontline extension staff used “exposure visits” as a primary experiential learning method of introducing local farm leaders (both male and female farmers) to new high-value crops or products being produced by innovative farmers in other *kebeles*, *woredas*, and even regions. The opportunity to learn about new high-value crops

or enterprises from innovative farmers who are already successfully producing and marketing these crops or products would resonate strongly with most interested farmers. Once these local farm leaders think a new crop or enterprise has a good chance of success in their own *kebele*, they will be ready to learn the necessary technical and management skills from trained extension workers (SMSs).

In India, local extension agents called these innovative farmers “farmer professors” and sought their interest, support, and expertise in (1) creating local producer groups for specific high-value crops and products, (2) providing the necessary start-up technical and management support for other farmers, and (3) arranging for the packaging and/or marketing of these high-value crops and products. Once these various groups of small-scale farmers became engaged in their first new enterprise, they immediately began exploring other options that would further increase farm household income (see Singh, Swanson, and Singh 2006; Swanson 2008b).

Recommendations

Enhanced Training with a Focus on Existing DAs

DAs need better training in a number of dimensions: broader technology skills applicable to their local area, soft skills that enable them to work with different types of farmers and pastoralists in a participatory way and to catalyze the development of farmer groups, and business and entrepreneurial skills that help them run the FTCs as revenue centers and to demonstrate economic thinking to their customers. The need for such skills was expressed by the farmers, as well as others, during the study. This need should be reflected in an adjusted schedule for ATVET students. More importantly, a major effort should be made to deliver these skills to the existing DAs via in-service training offerings. Details are provided below.

DAs need to be knowledgeable about all the major farming systems pursued by different categories of pastoralists and farmers within their *kebeles*, as well as how these farming systems are changing as farmers move into new high-value crop and livestock systems. This type of training should be organized through appropriate in-service training courses and could be organized for DAs at the ATVET level or at the *woreda* level, led by SMSs. The choice of training should be driven by farmer needs and should be jointly decided upon with the supervisors of the DAs.

DAs also need better training in business administration and economics. They need to make investment decisions on the DFs, take loans, run small operations, and—more importantly—teach farmers how to run their own enterprises economically.

Another important area that needs attention is training on the organizational and leadership skills needed to organize producer groups, especially among small-scale and women farmers. These producer groups will become important as farming systems change, so different producer groups will be needed to set up marketing chains for different types of high-value crops and livestock products. And the management capacity of these producer groups will differ somewhat in terms of quality control for their respective products and the need for more direct supply chain management.

In addition, DAs (and SMSs) should be trained in specific ICT and extension training skills. For example, none of the ATVETs that the authors visited had any computers with Internet access that were available for training and/or use by students in developing their ICT skills (see Section 5). However, once *woredas* have extension-linkage centers with Internet access (see below), then both SMSs and DAs will have easier access to technical information, training materials, and marketing information from both national and international sources. Also, mobile telephony could supplement the use of the Internet in enhancing information access. In addition, both DAs and SMSs need to learn how to use interactive teaching/learning skills more effectively as they organize and provide extension training and demonstration activities for various groups of farmers.

Generalists Rather than Specialists

Although there has been and will continue to be debate on the topic, the recommendation of the authors, based on the extensive literature review, discussions with many stakeholders, field research, and worldwide extension field experience, is that DAs should receive a more generalist training. DAs should be trained and then assigned to work as general DAs to serve specific service areas (villages) within each *kebele*, with SMSs serving as the specialists within the extension system in providing specialized training and technical assistance to DAs and/or farmer groups based on specific needs and problems. Consequently, the ATVETs should modify their curriculum to train more generalist DAs who more fully understand the major farming systems within the region, including training in farm management, marketing, and value-chain development that reflects the continuing diversification of farming systems within the region. In addition, if this policy is enacted, then the current DAs will need short-term in-service training courses in those technical, farm management, and marketing areas that are suitable for the farming systems in their particular *woredas*. Given the past specialist training, a more generalist profile of the existing DAs can be achieved by taking in-service training classes that fill the most important knowledge gaps. In this way, an FTC will have three generalists, but each of them will have a deeper knowledge spike in a particular area, which is a “best of both worlds” solution.

Attractive Career Paths

The MOARD should develop a more systematic career path and performance award program for the *kebele*-level DA staff to incentivize, recognize, and reward superior performance. The authors suggest some specific options the MOARD should consider in developing a career path.

- After two or three years of superior performance at his or her first FTC, a junior-level DA should have the opportunity to apply for either a senior DA position or another FTC position that is closer to the *woreda* headquarters (especially as DAs marry and have children). Once appointed as the senior DA at any FTC, the individual should receive a small salary increase of 50–100 birr per month.
- After two years of professional service, all DAs should be entitled to a small annual salary increase to encourage them to continue serving the needs of farmers in their *kebeles* rather than looking for other nonextension jobs. For example, if they were given a 5 percent annual increase each year from years 3 through 5, and then a 4 percent annual salary increase from years 6 through 10, then after 10 years of service the senior-level DAs would have an average salary of about 1,300–1,400 birr per month and regular DAs would have an average salary of 1,230 birr per month.
- To enhance the capacity and expertise of the DA staff, after three years of professional service they should be encouraged to apply for an expanded number of university scholarships, with selection being based solely on superior or outstanding performance. Ideally, at least 10 percent of the DA staff with three or more years of experience should be selected each year for one of these part-time scholarship programs (courses are scheduled during the slow season of the year). These part-time degree programs take about five to six years to complete. Under this arrangement, the majority of above-average DAs would be able to complete their BSc degrees within about 10 years of service. Any DAs who resign from their extension positions while working on their university degrees would immediately lose their university scholarships; therefore, this condition would be a strong incentive for them to continue working hard in their field extension positions while completing their university degree programs.
- After completing their university degrees, all DAs should be able to immediately apply for supervisory or SMS positions at the *woreda* level based on their level of performance and area of expertise (based on their degree program). Presently, inexperienced BSc degree

graduates can move directly into these SMS positions without having any extension or practical on-farm experience. DAs should be given the opportunity to move to higher-level positions within the extension system.

- Every year, superior performance award certificates should be given to different categories of field extension staff (both DAs and SMSs), based solely on specific performance criteria. A person should be eligible for these only once every five years, so that these awards can be conferred more widely to DA staff across each *woreda*. Examples of the possible performance certificates that might be given to different categories of extension staff could include the following:
 - Two superior performance certificates to the most outstanding “young” DAs, with two to five years of experience
 - One senior extension award certificate for the most outstanding senior DA in the *woreda* based on actual performance, as well as a similar award for the most competent SMS at the *woreda* level who is providing active training and technical support to DAs and farmer groups throughout the *woreda*
 - One FTC “team award” certificate for the most outstanding FTC team (for example, based on specific criteria, such as number of producer groups organized, net revenue earnings from the DF, and so forth).

In addition, there could be other performance certificates based on years of service, such as 5, 10, 15, 20, and 25 years of service as DA or senior DA extension staff members. It should be noted that none of these certificates would involve financial awards but would simply be an attractive certificate, signed by the *woreda* director that could be displayed on the wall of the recipient’s office at the FTC, recognizing the individual’s superior performance in carrying out extension activities within the *woreda*.

Management and Systems

Strengths

A common feature of successful extension systems around the world is that they are driven by, and accountable to, farmers. This is reflected in the management structures of the field extension units. It should be noted that the basic elements for a more farmer-driven extension management system are already (partially) in place in Ethiopia. To begin with, the official extension strategy states that decentralized decision making and farmer participation are key attributes of the Ethiopian extension system. In *kebeles* in some regions, these crucial principles of good extension service are indeed successfully implemented. FTCs are steered by a committee that includes elected model farmers and pastoralists and representatives from women’s and youth associations, in addition to the *kebele* head (who acts as chairman) and representatives from the cooperatives.

BPR is being widely used with the intention of assessing the performance and impact of the field extension staff at the *woreda* and *kebele* levels.

Constraints

In a decentralized, farmer-driven extension system, extension staff should be accountable to the farmers they serve. However, in meeting with farmers on the FTC management committee, the authors learned that this is the exception rather than the rule. In some *kebeles*, farmers seemed to be unaware of what the DAs were actually supposed to be doing. Further, most FTCs are not steered by committees, and pastoralists and farmers have little influence on which technologies are offered or how funds are invested.

It is difficult to understand how the performance of DAs and FTCs is assessed. In fact, it was even difficult to obtain reliable data on the number of DAs in service, in some places, let alone the level of effectiveness of individual FTCs or the impact they have on pastoralist and farmer communities. Moreover, the supervision, management, and accountability practices of DAs at the FTC level are not

altogether clear. DAs are to be supervised by the *woreda*-level supervisory staff on a regular basis, but the lack of transportation made it difficult for them to make these supervisory visits. Within the FTCs, the management structure of DAs appears largely based on years of service, not on their respective management skills or ability to operate a successful FTC. For example, in some cases, if the head DA was a livestock person, livestock seemed to be the highest priority for that FTC, not what farmers wanted and/or needed.

Recommendations

FTC Management Committee

Each FTC should have a management committee representing all clientele groups within the community, including male and female farmers and pastoralists as well as rural young people and cooperatives (and, of course, the DAs). The *kebele* head would act as chairman, and the head DA as the coordinator who prepares the decision making process and manages the follow-up. Directly engaging these various rural groups and organizations in deciding on extension priorities will ensure that the DAs within each FTC are delivering needed extension programs and services and distributing any revenue generated by the DFs in a manner consistent with the FTC's development, as well as their being accountable to these groups. It also enhances the ownership of the FTC by the *kebele*, which is important because the *kebele* needs to support the FTC (such as with land, labor, and materials) and farmers need to be open to the services offered.

Performance Measurement and Management System

The authors recommend the establishment of a pragmatic performance management system at the *kebele* level. In the beginning, performance indicators can be largely input based, but over time they should increasingly shift toward output and outcomes. Performance should be measured based on a combination of generally applicable evaluation criteria and specific targets agreed upon between the DAs and their supervisors. In addition to measurable impact criteria, it is important to collect feedback from farmers and other stakeholders in the evaluation process. The feedback to the DA should be both evaluative and developmental and should include specific suggestions for further development. In each FTC, there should be a head DA who coordinates activities. This head DA should be nominated by the FTC management committee based on quality, not tenure.

Woreda Level

Strengths

Based on field estimates, there are roughly 7,000 SMSs and 4,000 supervisors employed in the public extension system in Ethiopia. SMSs at the *woreda* level play a critical role in training and providing technical support to the DA staff and pastoralists and farmers in each *kebele*. The experienced SMSs and DA supervisors interviewed at the *woreda* level have not only technical expertise but also considerable practical experience in providing technical and management support to both farmers and DAs at the *kebele* level. At the same time, these SMSs are the logical link between the DA staff and research scientists in addressing specific technical problems, and to ATVET teachers (and possibly those in agricultural universities), especially in arranging in-service training or in securing simple training materials. The third link is to markets and up-to-date market information, especially for emerging high-value crop and livestock products, since farmers will need these new types and sources of market information in making sensible farm management decisions.

Constraints

As noted above, SMSs are expected to provide training and technical assistance services to both DAs and farmers, based on specific needs at the *kebele* level. However, at present, most SMSs have very limited resources—especially transportation, training, and communication resources—to provide technical support and training services to DAs and farmers at the *kebele* level. As a result, most SMSs largely sit in their offices at the *woreda* level and are not even able to support DAs via remote communication. Today, SMSs are primarily accountable to the *woreda* agriculture director, rather than to FTCs and the *kebeles* being served.

Many of these SMSs will need additional training as the farming systems in each region continue to intensify and diversify. Most of the newly appointed SMSs have BSc degrees, but they have very little practical experience. Most SMSs need additional training in specific high-value crop and/or livestock systems, as well as training in farm management, business economics, marketing, and related soft skills (for example, teaching/learning and communication skills, as well as how to organize producer groups) that will be needed by the DA staff. These additional skills are necessary as the SMS works with the DA staff in helping male and female farmers, pastoralists, and rural young people respond to new and expanding market opportunities.

In addition, these SMSs have very limited or no linkages with research and educational institutions, nor with other sources of essential technical and marketing information, due to inadequate ICT capacity.

Woredas should also facilitate networking and best practice exchange among the DAs. With few exceptions, this objective is not met by *woredas* today.

Recommendations

SMS Skill Building

In-service training and educational opportunities should be made available for both new and experienced SMSs. First, SMSs who are interested in pursuing a BSc degree in their technical area should be given the opportunity to compete for university scholarships, based on their current performance. This opportunity will serve as an incentive to provide better training and technical support to the DA staff. In the process of pursuing the BSc degree, they will increase their technical competence and learn more up-to-date technical knowledge and skills. As with DAs, the university program should be part-time, so that they can continue to fulfill their job obligations.

Woreda Extension Linkage Centers

Each *woreda* should establish and support a *woreda* extension linkage center (WELC). This center would serve a number of purposes: It would be an information and knowledge center for DAs and SMSs, it would have books and research papers, and it would offer computer access (plus a printer) with Internet capability so the staff could communicate directly with key researchers at the regional and/or national level. This would also allow downloading of hard and soft copies of needed technical and marketing information, as well as available teaching materials that could be used to address the needs of the DA staff in each FTC. As part of this WELC, there should be a classroom or meeting hall where SMSs could meet with and/or train DAs and/or interested model farmers. The authors suggest establishing a monthly meeting day, during which SMSs can provide short training and DAs can share best practices and put important topics up for discussion. Under the IPMS project, some WELCs have been established. In order to limit the additional budget required, existing resources (rooms, ICT) should be used as much as possible.

Woreda Advisory Committee

To improve program coordination and assist in setting overall extension priorities across each *woreda*, a *woreda* advisory committee (WAC) should be established in each *woreda*, with one representative from

each *kebele*-level FTC management committee in the *woreda*. This WAC should meet at least four times per year to review the progress of the extension field staff in serving the *kebeles* and the various farmer groups (male and female farmers, pastoralists, and rural youth); help coordinate extension activities across the *woreda*; and set extension priorities for future activities across the *woreda* that could be implemented and supported by the SMSs, in collaboration with the DAs in each FTC. Note that this committee would not set the priorities on the FTC level, which is the responsibility of the FTC management committee.

Regional and Federal Level

Strengths

As noted earlier, the GOE is committed to building a strong and sustainable agricultural extension system. The MOARD has begun the process of decentralizing the extension system so it can be more effective in serving the needs of farmers in the various regions, *woredas*, and *kebeles* across the country. Each region now plays a greater role in setting extension priorities and in providing technical support services to the extension staff at the *woreda* and *kebele* levels. As explained in greater detail in the following constraints section, there are important differences between regions in how priorities are being set; however, this move toward further decentralization is a very positive first step. The task ahead is to continue this decentralization process down to the *woreda* and *kebele* levels in all regions, so that farmers will play a central role in setting extension priorities in their own communities.

Since extension priorities are now being largely set at the regional level, the authors found important differences in terms of the actual extension strategy being pursued in different regions. In some regions the extension strategy was already shifting to become more market-oriented, as farmers sought to increase farm income by pursuing new high-value crops (such as horticulture) and livestock products (for example, backyard poultry and beekeeping).

The primary functions of the regional and zonal extension offices in a decentralized extension system are to provide administrative and financial support for the extension field offices and staff, including monitoring the performance of SMSs and DAs, as well as assessing the overall accomplishments and impacts of the extension offices at the *woreda* and *kebele* levels. Regional extension offices are also responsible for coordinating and managing the distribution of awards and scholarships for high-performing field extension workers.

The senior-level extension directors and experts at the regional level with whom the authors interacted appeared competent. In some regions, these leaders are taking an important role in further decentralizing the extension system by encouraging the further diversification of farming systems, based on agroecological conditions. In particular, they are encouraging DAs to assist different groups of male and female farmers, pastoralists, and rural young people to pursue these emerging opportunities by providing training materials and other support service activities to the extension field staff. For example, in at least two regions, the regional extension directors are encouraging and supporting the field staff as they help farmers and pastoralists pursue emerging markets for these new high-value horticultural crops, livestock, and other products such as honey.

Constraints

Ethiopia's extension system currently advocates a farmer-driven, market-oriented approach that seeks to deliver extension services based on farmer needs and market demands. Strong efforts have been made to establish farmer input mechanisms (for example, farmer input groups at the FTC level), and the authors discovered some specific examples of true farmer-driven extension occurring in the field. The system's market orientation has made encouraging strides as well, with an increased focus on high-value and cash crops at the policy level. In some regions and *woredas*, however, the implementation of these farmer-driven approaches is lacking, and the policy and management focus continues to be hierarchical and more focused on technology transfer. In these cases, *woreda*- and *kebele*-level extension workers are assigned responsibility for disseminating "standard" production practices for the major food crops across the entire

region instead of following a farmer-driven approach that would include a greater focus on entrepreneurialism, cash crops, and farmer group development. These extension fieldworkers are failing to promote a more balanced and expanded extension program that pays attention to the intensification and diversification of farming systems across the different *woredas* and *kebeles* of the region.

Linkages with players outside extension also require strengthening. The previous centralized system had stronger linkages; now decentralization has reduced the linkages and made the responsibilities of the various administrative bodies more fluid and unclear. Limited collaboration exists between government extension, NGOs, universities, and research institutions, with weak linkages between extension and farmer organizations, input supply companies, and agroprocessing firms (Tesfaye 2008). Specifically, the linkage gap between research and extension is the most important to address, as technologies developed by research are currently not informed and driven by the on-the-ground realities seen by extension field staff. Farmers, DAs, and other field-level extension views must be incorporated into federal and regional research priorities in order to ensure the effective development of new technologies that meet farmers' needs. The establishment of the Regional Research Extension and Farmer Linkage Councils (RREFLCs) and Zonal Research Extension and Farmer Linkage Councils (ZREFLCs) has improved matters in some regions, but more progress could be made. In particular, the ZREFLCs need to foster local communities' empowered involvement in planning, prioritization, monitoring, and evaluation of the programs and institutions that affect them.

Recommendations

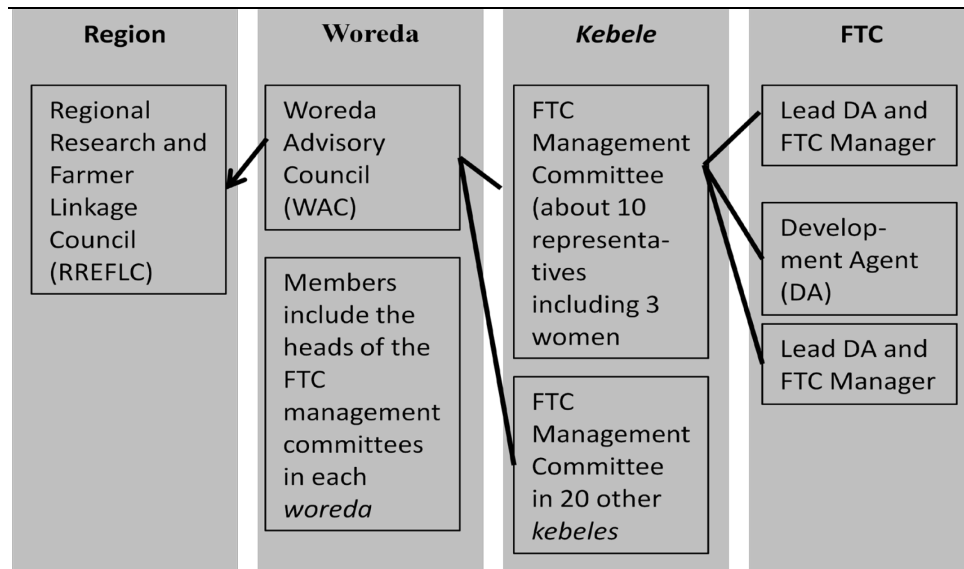
“Walk the Talk” on Decentralization in All Regions

The extension system across all regions of Ethiopia should continue to transform into a truly decentralized management structure. The following key roles and responsibilities should be carried out by the various system levels:

- Federal-regional-zonal: Policy, administration, resource management, education
- *Woreda*: Extension program coordination, including training and providing technical support for DAs and helping them link with research, markets, and so on, to solve local problems and constraints
- *Kebele*: Program delivery based on farmer needs and demands, including the intensification and diversification of farming systems in each *woreda* and *kebele*, based on agroecological conditions and access to markets for different crops and products

As shown in Figure 6, if extension priorities are to be decentralized to better serve the specific needs and opportunities of farming and pastoralist households at the *kebele* and *woreda* level, then these needs, opportunities, and priorities (for all major categories of farmers) must be agreed upon—first at the *kebele* level (for example, through the FTC management committee), and then this FTC plan should be reviewed, coordinated, and supported by the *woreda* Advisory Committee (WAC).

Figure 6. Suggested farmer-driven extension management structure



Source: Authors.

At the national, regional, and zonal levels, senior extension officers will need to continue monitoring extension activities and impacts, as well as maintaining adequate financial support for this increasingly decentralized extension system. In addition, they will need to compile information on the overall performance of the extension system and its staff in achieving national food security and improving farm incomes. This information can then be used to demonstrate the importance of extension and the need for continuing government support and funding for the overall extension system. It should be noted that in other countries, a continuing problem of decentralized extension systems is that no one at the national and regional levels has up-to-date and accurate information or valid data on these performance indicators of the extension system and its field-level staff. As a result, it is difficult to compare the performance of these extension systems, especially between regions and *woredas*. However, if basic ICT capacity can be extended to the *woreda* level, then it should be possible to ensure that up-to-date and accurate BPR information is available to assess the performance of the SMSs, as well as the DA staff in each *kebele*.

Explore Opportunities to Strengthen Linkages with NGOs in the Extension Environment

Opportunities exist to draw upon NGO and private-sector expertise in the implementation of extension exercises, and to encourage knowledge sharing and collaboration between these groups that are already active in the field (the SG-2000 experience provides a good example of extension linking to NGO fieldwork). Linkages in other sectors should also be explored: collaboration between extension and public health sector efforts (such as nutrition efforts), for example, could reap synergies and ultimately serve the Ethiopian public more effectively.

5. RESULTS AT TRAINING LEVEL

The Ethiopian government has responded to the growing farmer demand for extension services to improve productivity by establishing the Agricultural Technical and Vocational Education Training (ATVET) program. ATVETs train DAs to work in FTCs to enhance the knowledge base and skills of farmers and thereby provide the institutional framework for increasing the efficacy of agricultural extension services. Before the ATVETs, the universities were the only institutions offering training at degree and diploma levels in general agriculture.

Introducing ATVETs has helped address some of the major constraints faced by the National Extension Intervention Program (NEIP). The NEIP drove short-term gains in increased agricultural GDP in the 1990s, primarily through a top-down delivery of massive production inputs, including improved seeds, fertilizers, and credit (Ethiopia, MoARD 2005). This supply-driven program faced several limitations, including the marginalization of farmers outside high-potential areas (the majority of resource-poor farmers); an understaffed field-level extension service characterized by passive transmission of recommended messages to farmers, with little technology adaptation to local contexts; and eroded credibility of the frontline field-level extension workers among smallholder farmers. The ATVET approach aims to redress some of these limitations.

Programs and Curriculum Offered at ATVETs

The ATVET curriculum was first introduced in September 2000 by the Ministry of Agriculture (now MOARD) in 28 ATVETs located across the country. In 2001, the number was reduced to 25.

ATVETs seek to produce mid-level, skilled, and competent agricultural DAs who will then teach farmers at FTCs. The ATVET colleges provide a three-year diploma program in one of five disciplines: Animal Science, Animal Health, Agricultural Cooperatives Development, Natural Resources, and Plant Science. All ATVETs offer Animal Science, Natural Resources, and Plant Science. Only a few colleges offer Animal Health and Agricultural Cooperatives.

- **Agricultural Cooperatives Development Department**

The Agricultural Cooperatives program is offered through two departments: Agricultural Cooperatives Organization and Management, and Agricultural Cooperatives Accounting and Auditing. The program focuses on social, political, and economic consciousness; managerial, marketing, and controlling capabilities; salesmanship; and marketing management, accounting, and auditing.

- **Animal Health Department**

The department offers basic courses on animal anatomy and physiology, infectious and noninfectious diseases, and drugs and their administration.

- **Animal Science Department**

The department offers courses on animal production and management, range management, animal nutrition and health, animal health and breeding, hide and skins, fisheries, and marketing. Practical skills are enhanced by providing farmstead structures, initial establishing stock, farm equipment and facilities, and animal feed production farms.

- **Natural Resource Department**

The department provides basic courses on the development and sustainable use of natural resources (forests, soil, nontimber forest products, alternative energy sources, and so on) and water harvesting technologies. Practical skills are developed by providing tree nursery farms, agroforestation/reforestation demonstration units, soil and water conservation demonstration units, and equipment and facilities.

- **Plant Science Department**

The department offers courses on the basic concepts of plant development, external and internal structures, growing media and their constituents, production technologies and their management, major pests and their controlling methods, postharvest handling, and processing techniques. Focus is placed on the production technologies of cereals, pulse crops, oil crops, vegetables, root tubers, fruit crops, industrial crops, and fiber crops. Practical skills are achieved by offering agronomy crop farms, fruit crop production, horticultural crop farms, research plots, and farm equipment and facilities.

- **Basic and Supportive Courses Department**

This department offers basic and supportive courses including basic science courses such as computer applications; English; math; supportive courses such as agricultural extension, agricultural cooperatives, civics and ethical education, pedagogy, and physical education; and business courses such as farm management and general business.

Students in each discipline take 16–17 credits per semester. At the end of the course, the students are expected to have completed 76 credit hours, fulfilling the requirement by the Ministry of Education (MOE). This is a requirement for accreditation for all diploma programs in the country, including the ATVET program.

Institutional Coordination of ATVETs

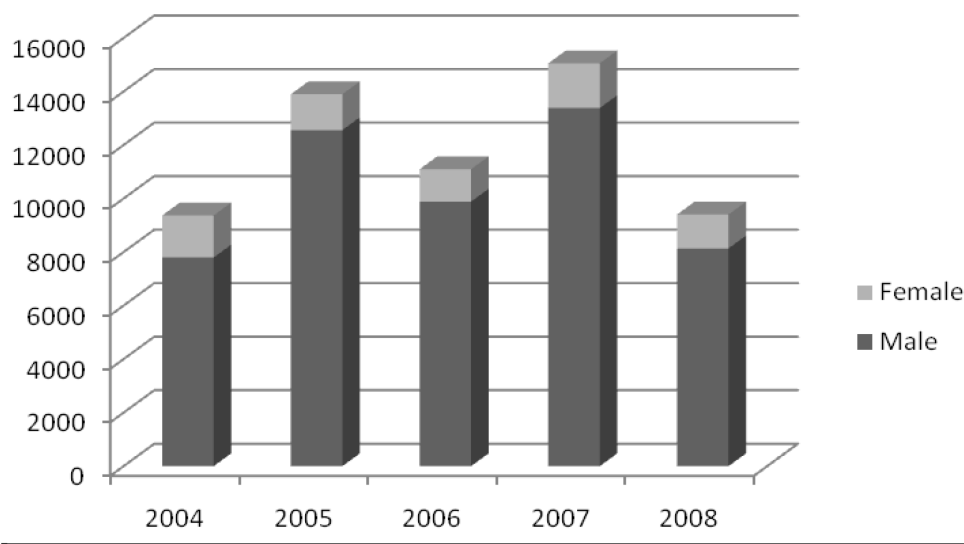
There are two classes of ATVET colleges: federal and regional colleges. There are seven federal colleges (four from large regions and three from emerging regions) that report to and are managed by the MOARD. The rest of the colleges (regional colleges) are managed by the BOARDS or the MOE through the TVET Commission or TVET Agency. The regions are mandated to decide which institution the ATVETs report to.

Each college is internally managed by the College Academic Council, consisting of the dean of the college (chairperson), two deputy deans (one in charge of academic affairs and another in charge of administration and development), the heads of the academic and research units, two representatives of the teachers, the heads of the registrar and documentation office, the dean of students, a practical training program coordinator, and one representative of the college student community. The council is guided by academic rules and guidelines prepared by the MOARD. Each college has powers and duties to design and implement training programs based on the standards issued by the MOARD and based on the needs of the agricultural development of the country.

Growth of DA Training

The 25 ATVETs graduated the first DAs in 2004. Figure 7 shows that more than 8,000 DAs have been qualifying and graduating every year. More than 1,000 students have graduated from most ATVET colleges since the establishment of the training program. By 2008 the colleges had produced nearly 60,000 DAs (12 percent of them women).

Figure 7. Female and male ATVET college graduates, 2004–2008



Source: ATVET, Addis Ababa.

Other ATVET Services: Research, Direct Extension, Ongoing Training, and Seed Multiplication

In addition to their training role, the ATVET colleges have expanded their mission to include the provision of nonformal specialized short-term training, skill-gap training, entrepreneurial training, applied technology transfer, and services for farmers, agriculture businesses, and the public sector (Kreuchauf 2008). Other services that ATVETs offer include the following:

- **Research activities in the areas of crop science, animal science, and NRM**
Some colleges have started research projects with competitive funds allocation by the Science and Technology Commission. The research undertaken includes sericulture, water harvesting, irrigation, and cropping systems.
- **Direct extension services, sometimes with NGOs, through FTCs for farmers at both small and large private farms**
The ATVETs work closely with farmers to provide technical information on crop production, livestock production, and NRM. NGOs such as the Food and Agriculture Organization of the United Nations (FAO), FARM-Africa, the Red Cross, and Bio-Safe have been implementing very innovative extension (Aberra and Teshome 2009). Some ATVETs link with NGOs working nearby to share information and experience. The limited extension provided by the ATVETs (and NGOs) complements the extension provided by the DAs.
- **Short-term training for DAs and paraveterinary technicians**
Some ATVETs arrange short-term and in-service training for field-level extension agents. This provides an opportunity for field staff to upgrade their knowledge and skills.
- **Multiplying seed for farmers**
Though the ATVETs' mandate is not in input supply, some colleges have been supplementing the seed supply industry by producing seed and selling it to farmers.

ATVET Strengths

The existing ATVET system has a number of strengths that provide a sound base upon which to build:

- Physical ATVET network**
 In six to seven years, Ethiopia has rapidly established 25 ATVETs, which together have produced nearly 60,000 newly trained DAs. They provide access to education, through the FTCs, for adult learners who traditionally do not participate in the formal learning system. Almost all the ATVETs have adequately furnished classrooms, and most have basic library and laboratory facilities.
- Broad ATVET service offering**
 In addition to offering DA training, several colleges are providing in-service training, refresher courses, direct extension, and a range of short courses in technical areas such as fruits and vegetables (agronomy or crop science), beekeeping, poultry, dairy, and the fattening of both cattle and small ruminants.
- Qualified instructors**
 The ATVETs are increasingly being staffed by well-qualified instructors (Table 2). Most teaching personnel in these ATVETs are BSc holders, and this number has on the whole been increasing since 2001/02 (Ethiopian calendar year 1994). The number of female BSc instructors is also increasing slightly, though it remains relatively small. The number of MSc holders has also been increasing gradually.
- DFs**
 Some ATVETs have DFs for practical training as well as income generation. The DFs' output includes food, cash crops, and livestock. The produce from these farms is consumed by the colleges, which reduces college expenses—and in some cases the produce is sold at local markets.
- Linkage creation**
 ATVETs create active and meaningful collaboration among DAs, NGOs, and communities of farmers, regardless of educational level, language, culture, technology, and geography. Some ATVETs are involved in community projects that draw DAs, NGOs, and farmers together to learn about new technologies and practices in crop production, livestock production, and/or NRM through workshops and field days.

Table 2. Categories of teaching staff in five ATVETs in Gewane (Afar), Chiro (Oromiya), Wukro (Tigray), Dilla (SNNPR), and Bure (Amhara)

Major categories of teaching staff	2- to 3-year agricultural diploma from college/university			BSc degree			MSc degree			PhD degree		
	M	F	T	M	F	T	M	F	T	M	F	T
Year EC (GC)												
1994 (2001/02)	8	1	9	64	1	65	-	-	-	1	-	1
1995 (2002/03)	9	-	9	127	4	131	-	-	-	1	-	1
1996 (2003/04)	10	-	10	188	6	194	1	-	1	1	-	1
1997 (2004/05)	7	1	8	190	13	203	3	-	3	1	-	1
1998 (2005/06)	13	1	14	194	12	206	4	-	4	1	-	1
1999 (2006/07)	22	2	24	186	11	197	6	-	6	-	-	-
2000 (2007/08)	17	2	19	174	13	187	9	1	10	-	-	-

Source: Authors.

Note: EC = Ethiopian calendar, GC = general calendar.

The strengths of the existing ATVET system have already served farmers well. The education and training offered has helped strengthen agricultural services and systems for improved agricultural productivity by enhancing the capacity of farmers to become aware of and adopt economically viable and environmentally sustainable technologies and practices. Some colleges have become true centers of innovation for dissemination to farmers. These strengths provide a strong foundation on which to build.

One example of a center of innovation is in Assosa. Mushrooms are a delicacy eaten by many people in the region, and the market demand for mushrooms is high. They are usually collected from the forest and farmlands during the rainy season.

The Assosa ATVET has started an innovative mushroom enterprise for training purposes as well as disseminating the technology to farmers and rural communities. The college first tried to domesticate local varieties. The performance was promising and motivated a search for ways to increase production. This has extended to exotic varieties, which have done well. The yield of these exotic varieties has been encouraging, at 1–1.5 kilograms per bag within a time frame of 20–24 days compared to 400 grams per bag within three months for the local varieties. Harvesting can also be performed four to six times from the same media, making it very attractive to farmers.

The college has put together a training package and has trained more than 50 students on mushroom production. In 2008 the college trained farmers from 40 FTCs in Assosa *woreda* through a grant provided by the Ethiopian Science and Technology Commission. A workshop for NGOs and farmers was held to check the potential and receptivity of mushrooms. Following the workshop, there has been increased demand for further training on mushrooms. Three NGOs have invited the instructor to train organized women's groups and farmers on mushroom production. So far the college has trained 20 women in one of the *kebeles* in Assosa supported by the Zonal Office of Agriculture. Two demonstrations have also been established at the Kubrehamsha refugee camp, one for the refugee camp and one for the local farmers.

The college has prepared a training manual in Amharic, which contains practical guidelines on mushroom production and handling of the mushrooms during harvesting. Another manual has been prepared in English titled "Practical handout for mushroom production" to be used in FTCs. Mushroom seed (spawn) is now being distributed to farmers near the college, and the demand for the seed is increasing.

Constraints of and Recommendations for ATVETS

Constraint 1: Insufficient and/or Poorly Prioritized Financial Resources

The major sources of ATVET funding are the MOARD, the BOARDS, the RCBP, and, to a very limited extent, the colleges themselves. The authors heard in interviews with college deans that these financial resources are not always sufficient to meet the needs of the college. For example, Internet connectivity is important in enhancing access to information for teaching and learning purposes; however, although most colleges have computer labs, they do not have the resources to support Internet connectivity.

Additionally, ATVETs are not adequately prioritizing the use of available resources, leading to operational shortfalls despite operational and performance planning.

Further, some ATVETs are not doing a good job of identifying strategic gaps where there is a compelling case for more funding, and not many colleges are seeking other sustainable ways of generating funds to supplement their financial resources. Doing so requires ATVET colleges to become more entrepreneurial, and for it to be permissible for them to reinvest revenues generated from their entrepreneurial initiatives back into the colleges, which provides an incentive to innovate.

Recommendation 1.1

Revamp the ATVET system and enhance its sustainability by revising the number and mandate of ATVETs and exploring opportunities to increase individual ATVET college sustainability.

The current ATVET system has largely achieved its overall goal, having trained nearly 60,000 DAs for service. Going forward, the mandate of the ATVET system will change due to the decreasing need for additional DAs and the increasing need for extension staff with higher skill levels to serve farmers. Various scenarios and options exist for the future use of the colleges. A recent study by the RCBP has proposed three options for future use of ATVETs (Kreuchauf 2008). One option is to use the colleges to top up DA numbers following attrition (8 percent, or around 4,800 new DAs per year) and to provide annual skill-gap training for existing DAs. About seven colleges are proposed for turnover training and two to three colleges for skill-gap training. The rest could then be transferred to other ministries (for example, MOE), converted into regional TVETs, or transformed into private institutes.

Another option would be for the 25 colleges to continue to provide DA training and continuing education, according to regional turnover. In this option, each college should also provide a full range of programs for rural youth and private-sector training.

The third option, which combines the first and second options, is to concentrate DA training in selected colleges (1–2 in each region). The other colleges (15–16) would then be transformed into ATVET institutes for the delivery of massive lower-level programs; nonformal, short-term training; and business services.

This paper recommends further enquiry into this aspect of the ATVET network.

Recommendation 1.2

This recommendation entails strategically equipping active ATVET colleges with needed facilities and equipment to improve training. These investments may include investment in ICT (primarily Internet access), required textbooks, reference materials, lab materials, and equipment to support study of the physical, chemical, and biological processes of agriculture. Other facilities might include a milk processing unit, a veterinary clinic/laboratory, an agronomy and soil laboratory, soil and water engineering units, and a greenhouse. Farm demonstration equipment, machinery, and implements would also be required.

The funding for this equipment program could be made available from the operating budget released by the expected decrease in the number of ATVETs as DA training volumes decrease. Partnerships with universities, research centers, and NGOs that encourage facility and experience sharing may provide another avenue.

Constraint 2: Insufficient Practical Curriculum

The current curriculum for the three main disciplines (crop science, plant science, and NRM) leaves little room for soft-skill training, does not provide for sufficient practical training, and is not sufficiently responsive to Ethiopia's evolving extension needs.

- **Little soft-skill development**
The curriculum contains few, if any, courses such as communication skills, social marketing, and community mobilization.
- **Insufficient practical training**
While the existing DA curricula indicate an ideal theory-to-practice ratio of 30:70, most officials whom the authors interviewed (at BOARDS, college administrators, and so on) indicated that the style of training is predominantly theory-based and with limited practical application due to a lack of equipment, labs, tools, practical tasks, and teaching materials. Some colleges have poorly equipped laboratories and limited workshop materials. Physical libraries exist but often with inadequate or irrelevant textbooks. Equipment for practical training is often rudimentary. Some DFs are adequately resourced, but most remain poorly developed, preventing student DAs from developing fully into skilled, competent, and efficient agricultural practitioners who can win the confidence of farmers.

- **Insufficient evolution to respond to market demands**
As Ethiopia's agricultural system evolves, the extension system will also need to evolve into a more market-oriented system that is geared toward helping farmers adapt to rapidly changing markets. This requires a curriculum that is more market-driven, supportive of diversified crops, entrepreneurial, farmer-centered, and empowering of women, and one that supports cooperative management.
- **Too much specialization too early**
Currently, the training is structured to produce specialists. In the old system before the ATVETs were established, trained frontline extension agents were generalists who were expected to serve farmers on all issues raised. The assessment has raised the question of whether DAs should specialize or be generalists, with more attention paid to farm management and marketing.
- **Insufficient attention to diversified farming systems**
Agriculture in Ethiopia is characterized by mixed farming systems of crop and livestock production. The majority of smallholder farms depend on the livestock subsector for power, cultivation, and transport of goods; it also makes a significant contribution to the food supply in terms of meat and dairy products, as well as to export in terms of hides and skins, which make up the second major export category (Kassa and Abebaw 2004). Within mixed farming complexes, cereal crops account for about three-fourths of the planted area, while the remaining cultivated area is devoted to the production of other annual and perennial crops such as pulses, oil crops, and coffee. As farmers begin to intensify and/or diversify their farming systems, DAs must understand more fully how these different crops and livestock systems link together. Currently, training does not develop DA skills in high-value crops or products and hence fails to prepare them to effectively work with farmers in diversified farming systems.

Recommendation 2.1

Revise the curriculum to make it market-driven and client-responsive. To do this, the Ethiopian government needs to consider involving all the stakeholders (ATVET, extension bureau, researchers, farmers) and other stakeholders (donors) in a curriculum review. The review should remove unnecessary courses and consider including courses on extension soft skills, advanced technical skills, business management, entrepreneurship, and farmer group development.

Recommendation 2.2

Enhance instructor capabilities by providing in-service and short-term training to develop instructors' practical training skills, basic entrepreneurial skills, college leadership skills, and management skills. Instructors currently have little opportunity to continue to develop their skills, conduct research, and share learnings, and a curriculum shift will create further need for an instructor skills upgrade. In-service and short-term training for instructors can help address this need and better serve DA education.

Constraint 3: Incomplete and Poorly Timed Apprenticeship Program

The duration of the ATVET programs is three years, with two years in the college and about a year's practical training (apprenticeship) in the *woredas* and FTCs. The ATVETs implement a series of practical training programs in collaboration with the rural community, when trainees go out for the apprenticeship programs. The practical training DAs receive focuses on production activities but provides limited exposure to markets and market linkages. Unfortunately, the apprenticeship program is also held during the off-season in October and ends in June when farmers are beginning to engage in their main farming activities.

Recommendation 3.1

Improve the apprenticeship program to provide apprentices with strong practical experience. The students need to gain hands-on experience working with and learning from progressive farmers. During the apprenticeship period, when most of the actual extension and training activities are carried out, the students should be assigned to work closely with strong DAs and SMSs when they actually carry out specific training activities, so they can assist in and learn from these extension activities. This training should be scheduled when farmers are engaged in their main farming activities. The apprenticeship program needs strong supervision by both the SMS and ATVET college instructors. There is also need for a feedback mechanism to identify gaps and training needs by the DAs.

Constraint 4: Weak Linkages between the ATVET colleges and the Agricultural Extension System, Research, and Universities

Several colleges do not have a systematic linkage with the extension system that absorbs its products. Most FTCs are not linked to the ATVET colleges to provide opportunities for DAs to improve their skills in practical applications. The ATVETs also do not have effective linkages with research centers and universities. These poor linkages mean the ATVETs do not receive the necessary feedback to help them adjust and deliver the services that are the most up-to-date and relevant to the extension system.

Recommendation 4.1

Strengthen linkages between the ATVETs, the agricultural extension system, universities, and agricultural research. Examples of this might take the form of short-term courses and in-service practical skills training for DAs and SMSs, SMSs being invited as guest speakers at colleges, colleges supporting woredas in preparing extension materials, ATVETs being linked with research centers and RREFLCs and ZREFLCs, ATVET colleges formalizing joint research programs with research institutions, or ATVETs becoming involved in FRGs.

ATVETs could also explore linkages at the interface between academia and industry (for example, rural technology centers and agroprocessing firms), to support the strengthening of innovation and entrepreneurship in the ATVET network. Some ATVETs, including Chiro and Assela, have formal links with national universities that have led to greater collaboration and opportunities for faculty and staff development. ATVETs could also explore linkages with international educational institutions. These types of linkages should be encouraged across the system.

6. RESULTS AT ENABLING ENVIRONMENT LEVEL

The countrywide enabling environment in which extension operates is critical to the success of extension efforts in fulfilling the government mandate of increased food security and the desire for increases in farmer income. The impact of enacting the full set of recommendations presented in this paper will be limited unless these efforts are accompanied by improvements to the Ethiopian enabling environment. In consultations with stakeholders and extension experts, the enabling environment was named as one of the greatest challenges facing the extension system today, and many enabling environment elements were discussed in detail.

Critical elements of an agroecology's enabling environment include agricultural production enablers (seed, fertilizer and other inputs, water management, credit, farmer producer groups), market access enablers (transport, markets, value chains), and economywide enablers (strong institutions, government policy, infrastructure). This section will discuss select components of Ethiopia's enabling environment in detail.

Agricultural Production Enablers

Seed

There are many challenges hindering the Ethiopian seed system. While Ethiopian seed research is quite established and has released hundreds of new varieties, farmer adoption rates of improved seed—even in reliable rainfed areas—are low. Around 12 to 15 percent of farmers use improved wheat and maize; less than 1 percent of farmers use improved seed for teff, barley, and sorghum (Spielman, Kelemework, and Alemu 2009).

This large disparity between seed supplied and demanded is driven largely by supply-side market failures (Spielman, Kelemework, and Alemu 2009). In every region that the authors visited, the problem of obtaining improved seed was mentioned by various actors. The Ethiopian Seed Enterprise (ESE) is responsible for responding to seed demand in the country. The ESE produces and multiplies seed, mainly through its own farms but also through subcontracting. The EIAR is also responsible for developing improved seed varieties and foundation seed. Although private companies (such as Pioneer) exist, they play a very small role in producing and distributing seed in Ethiopia.

Commentators point to a variety of factors driving seed issues in Ethiopia, including insufficient market transparency, ineffective and inefficient seed quality control, inadequate financing and lack of competition from the private sector, an absence of small seed companies to bridge the informal farmer seed systems to a more commercial industry, the ESE's profits channeling to the national budget rather than being invested back into ESE business development, seed pricing structures that do not incentivize farmers to reliably sell into the seed supply system, and very high rates of seed recycling (Spielman, Kelemework, and Alemu 2009).

Fertilizer and Other Inputs

Ethiopia ranks among the countries in Africa with the highest depletion of soil nutrients (more than 60 kilograms per hectare). As a landlocked country with difficult infrastructure, it also has low fertilizer use compared to other developing nations. Ethiopia's fertilizer industry has traditionally suffered from issues similar to those faced by the seed system, particularly as they relate to distribution. The GOE attempted to liberalize its fertilizer distribution in the late 1990s (Spielman, Kelemework, and Alemu 2009); however, private companies did not remain long in the fertilizer business due to government control of marketing and prices. Today, obtaining fertilizer is both difficult and cost-prohibitive for most smallholder farmers, yet productivity gains depend on this access. Smallholder access to fertilizer will be critical if Ethiopia is to see continuing increases in productivity; staple crop yields are most severely limited by soil

degradation. Other soil-ameliorating options are also being promoted by the government and others to improve the soil and reduce dependence on artificial fertilizers.

Water Management and Irrigation

Ethiopia is often referred to as the “water tower of Africa,” with considerable natural renewable water resources, including source contributions of 65 percent of the total average flow of the Nile. Despite this natural endowment of resources, Ethiopia has some of the lowest per capita storage in the world, with less than 100 cubic meters of water storage per capita compared to about 750 cubic meters in South Africa and 4,500 cubic meters in Australia. Currently, potential irrigable land in Ethiopia is clearly underdeveloped. Less than 6 percent of Ethiopia’s irrigable land is under irrigation, while figures for neighboring Sudan are 14 percent, and for Madagascar 32 percent.

Rainfall patterns in the Greater Horn of Africa are exceptionally variable in timing and across years. This variability has a twofold effect: direct productivity impacts on hydropower-dependent industries and irrigators when water needs are not met in critical parts of the season, and reduced adoption of improved inputs (for example, seed/fertilizer) among farmers in rainfed areas due to the risk of crop failure. A shift from rainfed to fully irrigated or deficit-irrigated cropping would increase food security. These impacts were observed anecdotally by the authors in the field. In Afar Region, the authors observed pastoralists transforming into agropastoralists because of an irrigation system developed at the Awash River. Similarly, in Tigray, due to heavy emphasis by extension on water harvesting, women were able to grow high-value vegetables close to their homes. These examples show that water management is key to increasing production, and that it is possible to implement successfully in very different contexts.

Farmer Credit and Financing

Ethiopia’s farmers have seasonal or irregular cash flows, uncertain harvests, and, in the current land-ownership construct, little to no physical collateral. Encouragingly, Ethiopia has a well-established microfinance law and has substantially liberalized its financial sector, being one of the first African countries to create a special framework for microfinance institutions (MFIs). Farmers’ access to agricrodit (and financial services more broadly), however, remains inadequate: of the estimated six million potential microfinance clients in Ethiopia, just over one million are currently being served. There is also very significant regional variability in the availability of finance institutes, and some regions (for example, Afar, Somali) have hardly any access at all. Additionally, cultural constraints in certain regions also prevent farmers from using microcredit.

Reasons include remnant challenges in the legal and regulatory operating environment, which still requires all microlending organizations to be supervised by the National Bank of Ethiopia and to be 100 percent owned by Ethiopian nationals; the requirement that minimum deposit rates of 3 percent must be obtained; and the requirement that private MFIs rely upon the slow and bureaucratic Commercial Bank of Ethiopia for their own cash flow needs.

Further, government-sponsored MFIs are said to keep interest rates artificially low, potentially crowding out all but the most efficient private MFI enterprises. They allow village councils to assign individuals to village loan groups, rather than allowing groups to form themselves (or for individuals to transact independently), and do not always offer products tailored to farmers’ needs (in terms of timing, length, and amounts). Credit access varies considerably by region and is hampered in part by distribution costs (in remote and inaccessible regions) and poor system oversight.

Fixing the finance issues is crucial for transforming the agriculture system, as it forms the basis for entrepreneurship on the farmer level. The Ethiopian extension system itself stands to benefit from the greater availability of financing for agriculture, as *woreda* governments and DAs could utilize microfinancing to strengthen FTC resources and stimulate revenue generation at the FTC level. Microfinancing also has the co-benefit of stimulating the formation of farmer groups, as this is usually a prerequisite for issuing credit.

In addition to this farmer-level financing need, financing gaps persist for Ethiopia's broader agriculture system, including processing, storage, and transport infrastructure financing.

Farmer Cooperatives and Producer Groups

Cooperatives traditionally serve an important role of farmer organization in agricultural economies. Many farmers in Ethiopia are members of cooperatives that are closely linked to local government administration. Cooperatives are found in nearly every *kebele*; sometimes two to three *kebeles* may organize one. Most cooperatives are for input distribution and marketing. Cooperatives form into unions, which are often responsible for collating and aggregating demand for seed, credit, and other inputs.

Beyond cooperatives, however, very few traditional farmer groups exist at the local level. Cooperatives are the usual mode of forming groups around agricultural production. However, due to negative experiences with cooperatives under the previous government, many farmers view cooperatives with distrust or as simply a tool of the government. Other local traditional groups that exist in rural Ethiopia include *iquob* (savings and loans groups) and *idur* (burial societies). These types of groups can be targeted for building capacity among farmers and increasing levels of empowerment. At the same time, much more group development, especially in the form of producer groups, needs to take place among rural Ethiopian farmers so that farmers can take advantage of economies of scale, access information, provide feedback to the government, and receive social support.

Market Access Enablers

Market access enablers are critical in order for farmers to reap the benefits of increases in production. Reducing market transaction costs, increasing value addition, securing and increasing demand for goods, and promoting an enabling environment for market access (including market information, storage, and transport infrastructure) are essential components of a sustainable agricultural transformation. While some regions benefit greatly from proximity to large markets and low transportation costs, strengthening and supporting these value chains will greatly increase the impact extension can have on the Ethiopian economy. Without these enablers in place, concerted productivity measures risk generating produce with nowhere to go, and subsequent erosion in the incentives to continue them.

While Ethiopian agriculture suffers from the range of market access problems pandemic across SSA, access to demand centers and transportation and transaction costs are particularly limiting. Remote regions of Ethiopia (for example, Gambella Region) suffer from very limited access to major markets, with high shipping costs and high transaction costs for obtaining necessary agricultural inputs. Due to these regions' location and distance from major demand centers, cropping systems are limited as well and tend to focus on staple crops, with little emphasis on the high-value food crops that could help generate higher farm incomes. Without investments in transportation infrastructure, these costs will continue to stunt growth and development in the far reaches of Ethiopia.

Specific crop value chains and value-added practices also need to be strengthened and encouraged in Ethiopia. Interviews conducted for this project identified postharvest management and postharvest processing as two areas with potential opportunities for investment at this time. The NGO community in particular views this as an area that can be strengthened and that can provide greater productivity and higher prices for agricultural products. Investments by NGOs in coffee postharvest management, for instance, have led to increased prices and increased access to international markets for Ethiopian smallholders; these types of practices could have a similar impact on other commodities and cash crops.

Economywide Enablers

In the broader context of the Ethiopian economy, economywide enablers—including strong policymaking, institutions, and infrastructure—ensure that the broad economic system works for Ethiopian farmers. Policy and institutions play a direct role in managing and prioritizing the many

interests and actors within the economic system, influencing how smallholders compete and interact within the market. Ethiopian agricultural policy will need to continue to focus on the smallholder and his or her success if the goals of extension are to be realized. Future investments in systemwide infrastructure can unlock even greater potential for Ethiopian agriculture as the overall economy strengthens. As Ethiopia's economy continues to grow, the agricultural system and its place in the broader economy will require continued support from these economywide enablers.

From a systemwide perspective, three policy areas should be considered in greater detail.

1. **Land tenure**

Land tenure in Ethiopia is directed entirely by the government, with smallholder farmers "leasing" land from the government. This policy, while allowing for government control of land resources, limits the ability and motivation of farmers to invest in their farms and limits their ability to gain credit, using land as collateral. If today's farmers had ownership rights, they could rent, sell, or mortgage their land. The Ethiopia Land Tenure and Administration Program (ELTAP) has recently started a process of land registration and certification, which is hoped will improve tenure security and investment. The GOE should continue to push for these types of positive changes to land tenure policies.

2. **Market orientation**

The official government policy of Ethiopia has a "commercialization of agriculture" focus (see Gebre-ab 2006), yet some policies of the GOE limit the market orientation of the current agriculture system. The government, pursuing nationwide food security policies, tends to crowd out private-sector players (see Spielman, Davis, et al. 2008). Most agricultural processes are dependent upon state intervention (such as fertilizer, credit). Furthermore, private society has weak capacity to participate. As the Ethiopian economy continues to grow, there will be increasing market opportunities for different types of high-value crops, livestock, and other products (for example, honey, fruits, mushrooms, and so on) that will increase farm income, and policies should be tailored to support these new market opportunities. In the process, farmers are also learning that they need to organize into producer groups to facilitate the marketing of these products. This emerging strategy should be encouraged, supported, and facilitated by the GOE and its agricultural extension system.

3. **Trade policy**

As the agriculture economy continues to strengthen, international trade can result in important new market opportunities for farmers. Coffee and livestock products already dominate Ethiopia's export market, but new export products and market opportunities are emerging (for example, flowers, honey, and so on), especially where Ethiopia has a comparative advantage. Trade policy should support this move and help Ethiopian farmers start producing for these emerging international markets. The GOE's submission of a Memorandum of Foreign Trade Regime (MFTR) to the World Trade Organization (WTO), which opens the long journey to WTO accession, suggests a growing openness to trade that would increase the competitiveness of Ethiopian agricultural products. In addition, current anecdotal evidence suggests that existing policies could be strengthened—for instance, farmers reported that the regulation surrounding the export of hides and livestock was cumbersome and difficult to manage. Streamlining current policies and working with farmers in pursuing emerging trade will make Ethiopian agriculture more competitive on a global scale.

Implications and Actions for Ethiopian Enabling Environment

Although the enabling environment in which extension operates is not without its challenges, steps are being taken today to ensure that Ethiopia's overall agriculture system, policies, and business environment are working in line with extension approaches for greatest impact.

Two specific programs that are designed to strengthen the overall Ethiopian enabling environment are the upcoming World Bank Agricultural Growth Program (AGP) and the Household Asset Building Programme (HABP) led by the U.K. Department for International Development (DFID). Both of these programs are seeking to analyze constraints on systems within the countrywide enabling environment such as seed, soil health, water management, credit, and market access, and will look to strengthen these systems with targeted investments over the next five-year period. These investments can potentially solve some of the major constraints that have a negative impact on extension services, such as limited access to seed and other high-quality inputs for farmer demonstrations and technology transfer.

The GOE must also play a critical role in strengthening these systems. Working with donor organizations on economywide projects, the government will play a critical role in ensuring that the desired outcomes are achievable and that the system responds to new demands in the enabling environment. The government has a particular role to play in economic and trade policy, especially as it relates to private-sector involvement in agriculture. The rapidly growing floral industry in Ethiopia is a good example of government policy allowing private-sector entities to strengthen and stimulate growth. Continued strengthening in this direction, with the aim of supporting smallholder farmers, can have a major impact on the overall agriculture environment and on extension's efficacy in particular.

7. ISSUES AND TRADE-OFFS IN SYSTEMS SUSTAINABILITY

Despite expectations that the existing extension system will yield ambitious gains in productivity and agricultural growth, the system also raises issues of long-term sustainability. If the existing field extension system continues to grow from the current 6,500 FTCs to the envisaged 15,000 FTCs, staffed at similar levels (three DAs per FTC) and supported by a similar arrangement of *woreda*-level SMSs, supervisors, and regional administration, there are significant implications for long-term government resources. Earlier sections on the field extension system, ATVETs and training, and institutional coordination also presented recommendations that imply new investments in both physical and human resources. Taken together, the current extension system and the recommendations outlined in this paper have serious resource implications in the longer term.

The trajectory raises two questions addressed in this section:

- **How can the GOE increase the sustainability of the current extension system, and what are the trade-offs?**
- **What are the alternatives over the long term for a less resource-intensive extension system that continues to meet the needs of Ethiopia's farming families?**

Sustainability has two dimensions. On one hand, extension systems balance the need to reduce costs with alternatives that recover operating expenses and, in some cases, generate revenue. On the other hand, extension systems are measured by their ability to enhance the productive capacities and livelihoods of their clients, primarily small farm households, and contribute to broader agricultural growth. This section illustrates how these different options can be mutually reinforcing—enhanced impact at the farm level and reducing systems costs, working in tandem. One such case (referenced in Section 4) is described here.

At an innovative FTC in the Atsibi *woreda*, Tigray Region, an entrepreneurial DA shared his model. In 2006, the FTC contained only the basic infrastructure—a classroom and office in a dryland DF. Through a local microcredit organization, the DA purchased a low-cost drip irrigation system for 950 birr. He planted tomatoes, and midway through the second of three annual harvests he repaid the loan. With new confidence, he took a second and larger credit to purchase a cow and began to diversify his horticulture production into new crops. The revenue from dairy and horticulture created a surplus to reinvest in the FTC, leading to more entrepreneurial demonstrations and more sophisticated water harvesting. By 2009, the FTC had built four housing units, purchased a bicycle for transport, and begun diversifying its livestock and cropping systems with spices and improved staples, as well as beekeeping. The entrepreneurial impact extends to farmers: 70 farmers now have credit for drip irrigation, beekeeping now complements traditional staples, and livestock practices are changing to zero grazing. Farmers attend FTC classes in overwhelming numbers, and DAs have transport to reach their villages on a regular schedule.

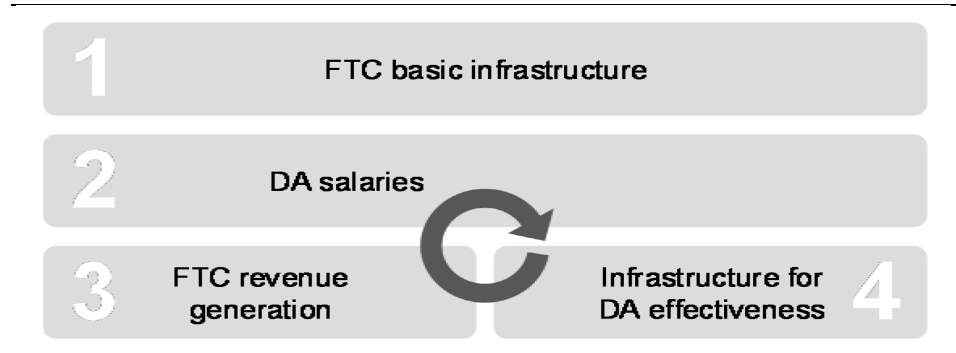
With entrepreneurial DAs, backed up by the necessary support of the *woreda* and the region, the FTC can be sustainable and have a high impact on farm household income as well. Sustainable best practices already exist within the current extension system—identifying the characteristics of these successes in diverse farming systems and demonstrating how to bring efforts to scale should be the goal. This section examines sustainability practices in two parts. Part I addresses trade-offs in the current system. Part II considers factors that affect how public extension can evolve in the longer term.

Sustainability and Trade-offs in the Current Field Extension System

The commitment to strengthen the extension systems through investments in needed infrastructure, resources, and capability building for field staff raises a wide set of questions on sustainability and the interest of the GOE in maintaining this level of investment. A set of key principles is needed for the GOE

at the federal, regional, and *woreda* levels to understand the factors and make these investment decisions. Figure 8 illustrates the potential cost structure of a revenue-generating FTC.

Figure 8. Cost structure for a revenue-generating FTC



Source: Authors.

Note: DA = development agent; FTC = farmer training center.

All FTCs require basic infrastructure, as detailed in Section 4. These fixed costs for construction typically include the building itself and 1.0 to 2.5 hectares of communal land provided by the local *kebele*, with labor costs and time for constructing the buildings being donated by the local farmers themselves. The other costs, especially cement and roofing materials, are financed by the MOARD with resources provided at the *woreda* level. DA salaries are funded by the federal budget, decentralized to the *woreda* administration. There is potential for FTCs to generate revenue while undertaking teaching and outreach—for instance, through selling produce or certain services. Similar to the Atsibi FTC case, this potential includes market opportunities from crop and livestock demonstrations generating revenue that can be reinvested in the FTC; options also include revenue from input supply, fee-for-service activity, and linkages to output markets. Infrastructure for DA effectiveness includes all resource costs (beyond the basic infrastructure) that enhance a DA’s ability to achieve farm-level impact and revenue generation (for example, transport and demonstration costs). At the FTC level, since basic infrastructure costs are largely fixed, resource trade-offs occur between staffing, the ability of FTCs to generate revenue, and the infrastructure for DA effectiveness.

The current plan staffs each FTC with three DAs, with each DA specialized in livestock, crop production, or NRM. Lessons from the T&V model from the mid-1970s to the mid-1990s, and regional extension experiences in South and East Asia, illustrate how high staff salary budgets constrain the resources necessary to invest in areas that enhance production: crop and livestock demonstrations, mobility of DAs to reach farmers, communications, and resources for training and skill development. The issue at hand here is not an overinvestment in personnel; rather, it is the trade-off between salaries for permanent staff and other operational costs. Operating costs are easier to minimize than permanent salary costs, so often these costs are the first to go when extension systems are faced with budget cuts. Unfortunately, this trade-off renders the entire system ineffective, with no access to necessary resources. In some instances, the more sustainable decision may be to limit staffing of DAs to two per FTC, thus creating cost savings that can be used for operational purposes.

These cost savings can then be reinvested in infrastructure for DA effectiveness. Interviews, focus groups, and workshops with DAs highlighted a common theme: transport, communication resources, farm demonstration materials, and adequate housing (in descending priority) are vital to DA effectiveness. In one workshop, DAs were asked to evaluate the impact of an FTC with three DAs versus an FTC with two DAs and adequate transport. The unanimous opinion was that two DAs with transport were more capable of meeting farmer needs. After transport, DAs concurred that the lack of timely and relevant information was also an impediment to their effectiveness.

Another approach to increase DA impact and system sustainability is through the utilization of “farmer professors.” Described in detail in Section 4 of this paper, farmer professors can act as an important extension resource, passing on knowledge and learnings from their own experience and extension participation to other farmers. This method has been employed effectively in other countries to increase the leverage of the extension system without incurring the additional cost of a larger number of extension agents.

A “farmer professor” program could be implemented in Ethiopia following successful models demonstrated in India and China. Participating farmers should be selected based on objective measurements that would be dependent on the major cropping system of the given *woreda*. It is important that individuals selected be employing accepted best practices and be able to support the farmer-driven extension curriculum in place within the community. Certification programs, allowing farmers to be recognized for applying best practices, can be an effective motivational tool and reward for participating farmers and can ensure that the best farmers participate in the program. This can be linked to the awards that the government currently presents each year in the regions. Once implemented, the program will become a complementary component to DAs’ efforts, strengthening extension outreach and bringing real-world experience from the best farmers in the *kebele*.

FTCs can also generate revenue to improve farm-level impact and sustainability. The experience of DAs in the Atsibi *woreda* is illustrative: access to credit enabled investment in commercialized demonstrations and revenues for the FTC to reinvest in diversification, new farm enterprises, and DA resources. Farmers then replicated the entrepreneurial demonstrations, modeling not only the DA’s on-farm practice but also its marketing skills, agribusiness acumen, and credit use. If FTCs are motivated to generate revenue with new enterprises, these entrepreneurial demonstrations are a dual catalyst for sustainable revenue for FTCs and increased on-farm production. The FTC management committee should have the authority to determine how the revenues from the DFs are spent and to ensure that the DAs do not allow the revenue motive to detract from their focus on demonstration. There are legal precedents for how this might interact with the national budgetary frameworks in Ethiopia’s school system. Even with three DAs, revenue generation is a vital step. With the right enablers in place, the trade-offs between revenue generation, DA staffing, and infrastructure for effectiveness enhance sustainability.

The example in the Atsibi *woreda* illustrates a key set of characteristics for this revenue-generating model to function at scale. First, two vital enablers are needed: the availability of credit, and the right skill set and responsibilities for DAs. Second, a set of supporting but not essential enablers enhances the likelihood of success.

- **Financial credit**

A common thread among entrepreneurial DAs is access to credit. In East Asian examples, particularly China, extension agents played a key role in facilitating government-financed credit to small farmers. The availability of this credit, along with subsidized inputs, remains a key ingredient in China’s success. The Ethiopian extension model is uniquely placed to move one step further. Whereas in China, extension agents facilitated credit to farmers, in Ethiopia, the breadth of the physical infrastructure with FTCs allows the extension system to experiment with DAs as credit recipients themselves. The model allows for unique entrepreneurial demonstrations at FTCs whereby revenue generation is also a process of knowledge transfer to small farmers. DAs are both credit practitioners and facilitators. Widely available credit, potentially revolving competitive funds backed by the public sector, or public–private partnerships with credit providers in regions with limited access, are critical for FTC sustainability.

- **DA skill development**

To begin to manage FTCs as market-oriented demonstrations, DAs require additional skills. Sections 4 and 5 of this paper describe the need for DA in-service training and recommend that DAs be equipped with more generalist training and practical experience. In addition to

these technical skill sets, DAs will require entrepreneurial, agribusiness, marketing, and credit training in the curriculum at the ATVET level, but also, and more immediately, through in-service training offered to existing DAs. Short trainings to hone these skills can be provided in two ways: through ATVETs and SMSs at the *woreda* and regional levels, or through peer-to-peer methods that link effective DAs to train peers in FTC business management. It should be noted that many SMSs would also benefit from greater skill development (and this may be a prerequisite for an SMS to lead trainings at the *woreda* level).

- **DA on-site responsibilities**

A senior DA could be primarily responsible for the FTC business management and marketing components, and one or two junior DAs could be responsible for the field extension and site visits. Given the revenue function of FTCs, one DA will likely need to have primary responsibility for business management.

- **Secondary factors**

Improved inputs, markets, irrigation, and transportation and improved input and output markets also create revenue opportunities for entrepreneurial FTCs in the longer term. For output markets, relationships between public extension (for aggregation and quality) and buyers of high-value crops create opportunities. However, output markets are typically the domain of producer groups and cooperatives, particularly in postproduction, where public extension will likely take a more facilitative role.

At the *woreda* level, the performance of revenue-generating FTCs requires coordination, technical assistance, training, and evaluation. Particularly to replicate the model, *woreda* administration will need training and guidance on how to implement these best practices. The administrative unit could also play a role in facilitating credit by expanding GOE funds for loan guarantees to back credit provision (only necessary in regions where credit is currently unavailable to smallholder farmers). Core activities are described below.

- **Set revenue goals and FTC-level budgets based on local context**

Regional differences between agricultural growth and food-insecure regions will affect how resource allocations are made. In practice, the five FTC levels outlined in Section 4 remain applicable here. Typically, only Level 4–5 FTCs will have the resources to begin revenue generation. That said, the MOARD can take key steps to expand access to the two key enablers for this transformation: widespread access to credit and entrepreneurial skill development. As FTCs begin to make entrepreneurial investments, it is important that decisionmaking remains bottom-up, with FTCs developing an investment plan based on a set budget and *woredas* holding FTCs accountable for anticipated results.

- **Analyze and determine appropriate numbers of FTCs**

The GOE faces a number of considerations in the expansion of the system itself from 6,500 to 15,000 FTCs in the coming years. A decisionmaking framework driven by strong evidence would enable the GOE to balance the trade-offs between the impact of more FTCs with the resource investment. The initial push for high national coverage was measured against the objective of one FTC per *kebele*. Given the high rates of coverage, emphasis can now be placed on quality.

Alternatives over the Long Term for a Less Resource-intensive Extension System

Agricultural extension systems change over time. The heavy GOE investments since 2003 are now at a stage where they will begin to show returns, and also are at a level of maturity to allow the analysis of issues of coverage versus quality, the role of the enabling environment, the ability of public extension to offset costs with revenue, and partnership with other actors. In this context, the section examines the

possibilities in the long term for a less resource-intensive and more sustainable extension system. Lessons from extension in other developing contexts highlight three key factors that affect long-term sustainability: revenues within the system, partnerships with other actors, and changes in the enabling environment. At a systems level, these are three key levers the GOE should consider at its disposal.

As countries industrialize, the demand and supply of basic extension services diversify. Yields increase and income-generating opportunities for smallholder producers multiply. Enabling environments also change. Infrastructure and transportation uncover domestic markets for rural producers. ICTs, from radios to mobile phones, are penetrating markets in SSA at phenomenal rates, and in agriculture the application of these technologies introduces newfound tactics to reach small producers with relevant and timely agriculture information.

Global shifts in demand also affect Ethiopian extension: the booming appetite in the Middle East and Asia for Ethiopian livestock exports, both hides and meats, affects how extension works with pastoralists and livestock farmers. In short, enhanced market linkages are now creating a strain on Ethiopian extension to diversify into high-value crops while simultaneously adapting the technology adoption model to intensify production in staples. For Ethiopia, the market opportunities pose a challenge for the extension system to balance the growth potential in highland “breadbasket” regions with chronic food insecurity, predominantly in low-potential agroecologies.

The availability of agricultural inputs has also been a historic driver for systems change in extension. Affordable microirrigation technologies and mid-scale irrigation investments multiply productivity. The provision of fertilizer and improved seed through nonstate actors, including producer groups and cooperatives, NGOs, and the private sector, introduces profit incentives that evoke a clear question: what are the parameters for profit incentives in the public extension system?

Ethiopia’s extension system is unique and continues to make great strides, particularly with the productive potential of the country’s agricultural sector. The degree of growth since 2002, both in personnel and in infrastructure, is unlike any other extension system in the world. In the context of sustainability, three core issues remain salient: models to generate revenue, links to a robust enabling environment, and the role of nonpublic actors. Lessons from other public extension systems show how the right mixture of shifts in these areas can be catalytic to systems change. Given the reach of Ethiopia’s field extension system, shifts in these areas will have wide and significant impact on farm production, livelihoods, and growth.

China’s experience with commercialized agricultural services illustrates a public-sector-led revenue model. Input distribution is a profitable source of sustainable revenue. For Ethiopia, the agricultural unions play a key role in this distribution; however, as seed supplies grow, the GOE could consider alternative models for public-sector input distribution. One option is for FTCs to link with input suppliers, or be input suppliers themselves, at the field level. The approach is a variation on China’s commercialized services and would, over time, add an input function to the FTCs’ current role in demonstration and farmer learning—and, in fact, it could be more catalytic because of the extensive field-level distribution network of FTCs. As with any revenue model, incentives and rewards must be appropriately designed to ensure that DAs continue to meet their primary goal of serving smallholder farmers.

Public extension can also consider two separate revenue sources: a DA fee-for-service model in high-value crops and livestock enterprises, or a fee-for-service model in postproduction activities. In both these areas, markets require specialized skills that can pay economic dividends to service providers. Several approaches exist, ranging from small commissions to the public system to direct payment for services. Particularly when the public sector has a profit motive, incentives can be considered for DAs to deliver quality services.

The field extension system is already interacting with NGOs and the private sector in the areas of input supply, output markets, and training. At some levels, the interaction is informal and uncoordinated: NGOs may use FTCs for farmer training on rain harvesting and microirrigation, or a microcredit organization may rely on an FTC to market loan offerings. The interaction is also formalized: NGOs may coordinate with the regional BOARD to conduct a set of trainings on beekeeping in certain *woredas*. For

the private sector, DAs and SMSs engage, albeit in a very limited fashion, with producer groups and input cooperatives on an ad hoc basis to facilitate access to improved seed, credit offerings, and output markets. Universities, research institutions, and producer groups also play a role.

Postproduction activities and high-value crops are areas in which public systems historically draw on expertise from nonpublic providers. The role of the private sector and NGOs is emerging in both postproduction and high-value crops, driven by profit motives and the potential for livelihood gains for small farmers. With a careful strategy, the GOE could harness the role of these nonpublic providers in specific areas. The Chinese model shows how competitive bids and tenders for these services can hold nonpublic providers aligned with and accountable to the public system. Public-private partnerships (PPPs) are also a technique to infuse new capital into productive areas. Recent investment in Ethiopia's livestock industry is an apt example of where enhanced scale is possible in postproduction. FTCs and DAs can potentially play a role in aggregating for procurement and quality control at the field level. They can also facilitate PPPs on the ground in relevant areas.

There is potential alignment for PPPs in credit provision. Existing government funds already provide loan guarantees and back risk for cooperatives and *woreda*-level resources. Given the potentially high impact of widespread and consistent supplies of credit, there is the possibility to identify strategies for the public sector to leverage other providers.

It is important to note that even in cases where some extension services begin to fall to other actors, some services always remain in public extension. Ethiopia's system sees some evidence of this shift today, with some services being provided by private-sector actors (for example, coffee). This should be viewed as a positive development for the system. However, public extension will always be crucial for farmers.

As discussed at length in Section 6, the enabling environment is a vital component in the long-term choices. The shifts in South and East Asian extension systems were sparked in large part by shifts in the enabling environment paired with economic growth. Problems with input supplies—especially the shortage of improved seeds and the prohibitive costs of fertilizers for many small farmers in parts of Ethiopia—are consistent bottlenecks to productivity. Similarly, the availability of credit is also an enabler that is lacking in many regions of the country. Inputs and credit work in tandem, and jointly can have a transformative effect on the agricultural sector when reinforced by a strong public extension system.

Considerations of sustainability and trade-offs remain central to the findings in this paper. The current growth of the system, while impressive in both scope and impact, requires more reflection in order to identify a best-fit solution for extension vis-à-vis other enabling systems. In the near term, the scenario presented in Part I of this section would address some immediate concerns about the current system's sustainability. If FTCs can be revenue-generating units at the field level, Ethiopia will have launched an entirely new model for demonstration and knowledge transfer.

This section emphasizes that the GOE and the public extension system have three important levers at their disposal for impact and sustainability: revenue generation, nonpublic actors, and the enabling environment. Each of these requires careful thought, foresight, and strategic planning; however, in different combinations these factors have been key drivers allowing public extension to drive agricultural transformation.

8. RECOMMENDATIONS AND POLICY IMPLICATIONS

Recommendations

In the results sections, this paper has described recommendations and potential change actions across each level of analysis, discussing potential avenues to improvement as they relate to identified constraints. Taken as a whole, these recommendations represent a cohesive set of actions that can be pursued to strengthen the Ethiopian extension system. The broad set of recommendations covers seven distinct themes, each influencing an important aspect of the extension system:

1. Farmer-driven orientation across all levels of extension, focusing on farmer needs at the *woreda* and *kebele* levels

The overall management and orientation of the extension system must be driven by farmer needs, from the types of services offered at each FTC to the overall strategic direction set by regional and federal policymakers. A farmer-driven orientation ensures that the extension system is serving farmers in their areas of highest need and allows for the regional and *woreda*-level flexibility required in an agricultural system as variable as Ethiopia's. This orientation must be balanced with top-down planning to ensure food security.

2. Broadening of extension services offered

This paper has described in depth the great variation in services required by the farmers, pastoralists, agropastoralists, women, and youth of Ethiopia. Extension will need to broaden services to meet the subject-area needs of all these groups, particularly as incomes continue to grow and farmers demand information on a more diverse range of crop (including cash crop) and livestock subjects.

3. Resourcing FTCs for farmer impact and sustainability

The current resourcing levels of FTCs—in terms of capital resources such as adequate buildings and demonstration plots as well as the operating capacity of the FTCs to provide farmer demonstrations—will need to be strengthened in order to have farmer impact. Recommendations include an increased focus on sustainability activities (such as increasing the introduction of revenue-generating demonstrations and the potential for financially sound loans and microloans for operational activities) at the FTC level.

4. Improving DA mind-sets and capabilities

DAs represent the front line of Ethiopian extension, and as such their own capabilities and knowledge to serve farmers is of the utmost importance. Recommendations such as strengthening the DA education system and providing in-service training courses on specific topics as demanded by farmers in each *woreda* will ensure that the system continues to serve farmers effectively; farmer-to-farmer programs (such as farmer professors) should also be leveraged to support and strengthen DA outreach and training.

5. Improving DA motivation and retention

Strong DA motivation to serve farmers is critical to the delivery of knowledge to farmers, and field experiences show that the DA's impact on the system strengthens as tenure increases. Recommendations that improve the DA experience (for example, messaging and support from the *woreda* and MOARD that focus on the important nature of DA services, development of a clear DA career path) strengthen the overall implementation of extension services at the farmer level.

6. Implementing a performance culture and transparency at all levels of extension

Several recommendations identified as critical to increasing farmer impact (for example, identifying metrics to track impact at the FTC level) relate to the need for an overall performance culture transformation in the system. An increased focus on understanding the extension system's

impact and improvements in extension reward systems can go a long way in pushing extension to be high performing and impact driven. The government's recent effort to implement BPR has brought a renewed sense of performance orientation to certain areas, but much more can be done.

7. Improving linkages throughout the system

This paper recognizes the importance of a systemwide approach to extension. Recommendations focused on increasing linkages between extension actors (for example, strengthening ties between DAs and SMSs through proposed woreda research and extension centers to strengthen the overall system approach and ensure that all actors are working together to reach extension's common goal. Specifically, the linkage between extension and research needs to be improved so that farmers can receive critical information and support in a timely manner and research efforts are tied to farmer needs. It is also important to note strategic linkages with nonextension actors (NGOs, private-sector entities) that impact how farmers are served through the system.

Additional Considerations

An important factor to be considered in broadening extension's priorities is the (potentially) important role of women in increasing farm household income. In most cultures, including Ethiopia, rural women are primarily responsible for agricultural activities carried out close to their homes, such as backyard gardening and poultry production. To increase farm household income, the emerging market demand for many high-value crop and livestock products falls within the traditional roles and responsibilities of rural women.

When small-scale and women farmers begin diversifying into high-value crop and livestock enterprises, the marketing of those products soon becomes an important constraint. The most effective way of both solving these marketing problems and enabling small-scale farm households to capture most of these revenues is by organizing interested farmers into specific types of commodity-based producer groups that are suitable for these different enterprises. Some of the emerging producer groups in Tigray are actually composed of and led by women farmers who are starting to produce fruits, vegetables, eggs, broilers, and other high-value products. In short, engaging women farmers in the production and marketing of high-value crop and livestock products is an excellent strategy to increase farm and pastoral household income.

Detailed actions that fall under each theme are illustrated in Table 3.

Table 3. Themes for recommendations

Themes	Activities
1 Shifting from farmer-driven orientation across all levels of extension	1.1. Ensure farmer-driven alignment across all levels of extension policy 1.2. Strengthen farmer-led decision making at FTC
2 Broadening of extension services offered	2.1 Increase/expand focus on cash crops, other income-focused products at farm level 2.2 Increase focus on marginalized groups (e.g. women)
3 Resourcing FTCs for farmer impact and sustainability	3.1.Resource FTCs to basic functioning level 3.2.Utilize credit to strengthen FTC operations 3.3.Stratigically invest in add-on resources and innovations
4 Strengthening DA mindsets and capabilities	4.1.Offer inservice training for DA skill building 4.2.Restructure and strengthen ATVET system and curriculum 4.3.Revise/strengthen DA apprenticeship/practical program
5 Improving DA motivation and retention	5.1.Implement DA, SMS career path 5.2.Revise/tailor DA staffing for placement, timing in FTC 5.3.Incorporate big picture thinking into extension system
6 Implementing performance culture and transparency across system	6.1.Launch performance management program across all extension levels with target-setting and tracking programs 6.2.Develop reward system for DA, SMS, FTC, decided based on performance metrics and farmer input/feedback
7 Improving linkages throughout extension system	7.1.Develop <i>woreda</i> research and extension resource centers to provide adequate linkage and information opportunities for DAs and SMSs 7.2.Foster improved linkages between research, ATVETS, on-the-ground extension through visits, farmers meetings, etc.

Source: Authors.

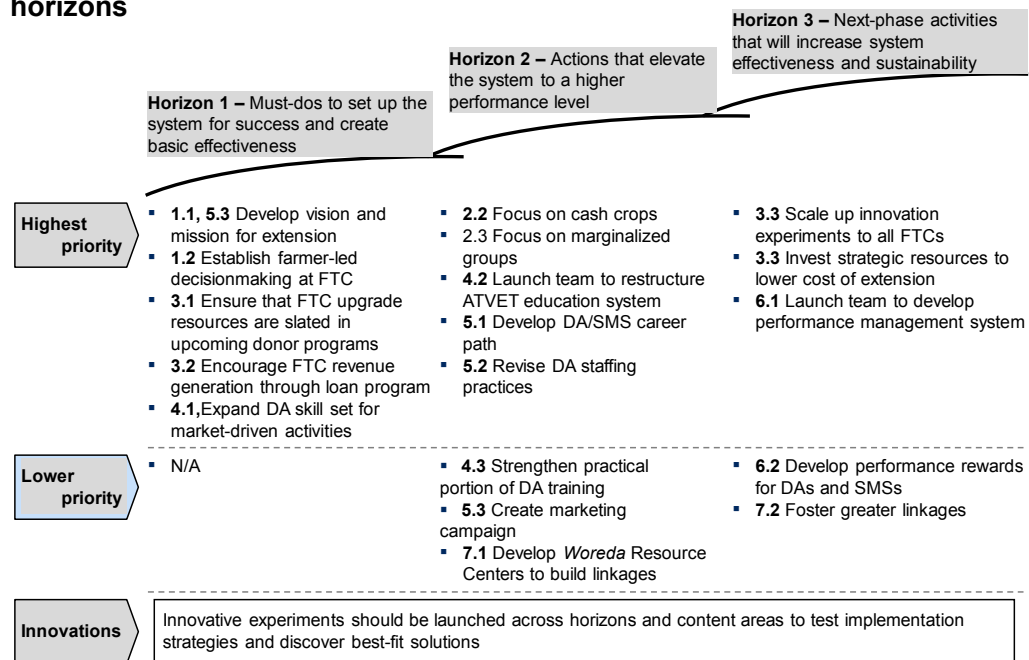
Note: ATVET = Agricultural Technical and Vocational Education and Training; DA = development agent; FTC = farmer training center; SMS = subject matter specialist.

Implementation Roadmap for Ethiopian Extension Transformation

In pursuing this set of recommendations, the GOE and the broad range of actors involved in Ethiopian extension (such as NGOs, donors, private-sector players) should take specific action along three horizons (Figure 9). These three horizons encompass a set of recommendations based on prioritization, timing needs, and dependencies within the system.

Figure 9. Time horizon for implementation

The recommendations have been prioritized across 3 implementation horizons



Source: Authors.

Note: ATVET = Agricultural Technical and Vocational Education and Training; DA = development agent; FTC = farmer training center; SMS = subject matter specialist.

Horizon 1: Immediate Actions that Create Basic Effectiveness in the Short Term

Horizon 1 activities are “must-do” initiatives that spur basic extension system effectiveness in the short term—in essence, those actions and recommendations that are of the highest priority and can have the highest impact on Ethiopian extension in the near term. Some of these activities require action from the GOE and MOARD; others will have a focus on partnership with donor organizations that are active in agriculture. Two programs in particular, the World Bank’s AGP and the DFID-led HABP, could potentially be partners in some of the baseline resourcing that needs to take place to strengthen the extension system. There are five specific Horizon 1 activities that should be pursued, in order, to maximize effectiveness:

- **Develop a clear vision and mission for Ethiopian extension.**

The authors recommend that the GOE develop a clear and meaningful vision for what extension should accomplish in Ethiopia, defining whom extension seeks to serve and the specific objectives it hopes to achieve. This clear articulation of objectives and priorities, currently lacking in the system, will align all involved parties and provide a guide on which to build a broad campaign for strengthening and improving the extension system. The government should publicize the effort to gain traction and momentum for the broader set of recommendations ensuring that regions, zones, *woredas*, and FTCs are all on point for the broader Ethiopian extension transformation. This activity will directly affect awareness of all seven recommendation themes and should be led primarily by the federal government with support from the MOARD. This is a relatively low-resource activity.

- **Establish farmer-led decisionmaking at the FTC level.**
The authors recommend that the MOARD take the immediate step to establish and/or strengthen farmer committees at the FTC level, involving a broad set of farmer stakeholders (including women, pastoralists, and so on) in the general operating decisions of the FTC. This important first step will help drive the shift toward a farmer-driven extension policy. This activity will have direct impact on recommendation theme 1 and should be led primarily by the MOARD. This will be a relatively low-resource activity, dependent mainly on initial direction by the MOARD and implementation and support from *woredas* and *kebeles*.
- **Start to expand the DA skill set for broadening extension offerings.**
The authors recommend that the MOARD launch a set of in-service trainings for DAs, SMSs, and other frontline extension personnel, focused on broadening extension services, soft skills, and entrepreneurial skills. This skill expansion is critical in moving to a more farmer-driven system (DAs need expertise to serve farmers in their requested areas) and will ensure that farmer-led decisionmaking at the FTC level is met by impactful trainings and demonstrations. This activity will affect recommendation themes 2, 4, and 5 and should be led primarily by the MOARD. Regions, *woredas*, and *kebeles* will be critical implementation partners as the program is initiated. This activity will have a moderate resource requirement and can potentially be supported with partnership from ATVETs, donors, and *woreda*-level government.
- **Ensure extension resources in upcoming donor programs to bring FTCs to an operational level.**
The authors recommend that the MOARD, in conjunction with multiple donor programs (including the upcoming AGP and HABP), ensure basic resourcing investments to bring FTCs to an operational level. Basic resourcing of FTCs is required to give extension the opportunity to service farmers in a meaningful way—farmer-driven, educated extension personnel will still have minimal impact without the capacity to host effective trainings, demonstration plots, and so on. This activity will affect recommendation themes 3 and 5 and should be led primarily by the MOARD, with significant resource commitments and activity from the donor and NGO community.
- **Encourage FTC revenue generation and financing for operational activities.**
The authors recommend that the MOARD encourage and stimulate entrepreneurial activity and revenue generation at the FTC level, incorporating farmer- and market-driven crop demonstrations with the proposed goal of self-sustaining FTCs. These activities should include specific programs created to offer small loans to functioning FTCs as operating seed for selected investments. This financing will allow FTCs the opportunity to test new revenue-generating ideas and will help broaden the focus of extension through new experiences at the FTC. These activities should be led by the MOARD, with support from the donor community for loan guarantees, ensuring that the program has incentive to support FTCs through operational loans that should be paid back. These activities will support recommendation themes 2, 3, 4, and 5 and will have a moderate resource requirement to cover the entire FTC system with operational loans.

Horizon 2: Actions that Elevate the Extension System to a Higher Performance Level

Horizon 2 activities will push the extension system to a higher level of efficacy, building on the basic functionality that is achieved through Horizon 1 activities. These activities are not as urgent or immediately impactful as those activities in Horizon 1, but they will still need to be implemented to have a fully functioning extension system and should be pursued as soon as possible in order to gain the full impact of extension. Activities include the following.

Highest Priority

- **Focus on cash crops.**
The authors recommend focusing on cash crops and other high-value products for the market, to increase income, especially of marginalized groups and women.
- **Focus on marginalize groups and women.**
Special approaches to reach women, pastoralists, youth, landless, and other marginalized groups are needed in order to bring the agricultural system to a higher performance level. By targeting these groups and the agroecological zones that many of them represent, the government can increase production and income in key areas.
- **Launch a project to experiment at selected FTCs and generate success cases.**
The authors recommend that the extension system experiment with new approaches and technologies at select FTCs to inform the overall system on best-fit practices and to generate success cases on which to base the overall system transformation. These experiments, generating insights in recommendation themes 1, 3, 5, and 7, can be donor-led with direct partnership with local execution partners, and will likely demand a moderate level of resources.
- **Implement revised DA hiring and staffing practices focused on home *woredas*.**
The authors recommend that the extension system begin staffing DAs in their home *woredas* and home regions and end the process of shifting DAs to different areas after limited periods of time in the field (less than one year). Altering these practices will have great impact both on extension efficacy (for example, DAs will be more familiar with home *woreda* crop systems) as well as DA motivation and retention, as DAs find greater job satisfaction. These practices, likely implementable by MOARD-wide policy shift, will require very limited resources.
- **Launch a team to develop DA and SMS career paths.**
The authors recommend that the MOARD launch a team to develop and implement DA and SMS career paths, increasing role clarity and the motivation of extension personnel as well as providing a suitable framework for performance management techniques. These activities will affect recommendation themes 4, 5, and 6 and should be led by the MOARD. Limited resources will be required.

Lower Priority

- **Launch a team to restructure the extension agent education system.**
The authors recommend that the current DA/SMS education system, including the ATVETs, be restructured and repurposed to meet the new needs of the extension system. As described in detail in this paper, these activities include restructuring the curriculum and practical components and shifting emphasis to a broader set of extension topics (such as horticulture). This team will likely be jointly sponsored by the MOARD and the ATVETs and will directly influence recommendation themes 2, 4, and 7. These activities will demand a moderate level of resources but will have significant impact in training new and returning DAs (in-service training) in new farmer-driven approaches and content areas.
- **Develop *Woreda* Resource Centers to serve as learning/ linkage points between DAs and SMSs.**
The authors recommend that *woredas* develop *Woreda* Resource Centers, offering a place for DAs to come to obtain information from SMSs, and host trainings. These centers would support greater service to farmers, as DAs would have more opportunity to connect with SMSs, research, and the broader extension community. Depending on the approach, costs

could be limited, as *woredas* leverage the buildings and infrastructure already in place. Some moderate investments in technology and training materials would be required.

- **Strengthen the practical portion of DA training in the field.**
The authors recommend that ATVETs and *woredas* work together to strengthen the practical internships undertaken by DAs in the final nine months of their training. Currently, most internships are ad hoc and poorly managed, with little supervision. Adding structure and clarity to the DA intern role and requiring time spent on the farm site in productive activity (shadowing either DAs or model farmers) would have a positive impact on DA preparation and would also help develop greater soft skills that the DA could bring into his or her new role. Led in partnership between ATVETs and *woredas*, this activity would be relatively low cost.
- **Create a marketing campaign for the extension program.**
The authors recommend that the MOARD launch a marketing campaign designed to increase the awareness and prestige of the DA program, helping to increase DA motivation and retention as well as farmer participation. Overall messaging should be relevant to the extension system as a whole, with a focus on DAs as knowledgeable workers in place to help Ethiopian development. Limited resources will be required.

Horizon 3: Next Phase of Activities that Will Increase Effectiveness and Sustainability in the System

Horizon 3 activities will strengthen the effectiveness and sustainability of the Ethiopian extension system as it grows and develops into a world-class system. These activities should likely be pursued after the extension system has been made operational and is broadly functional, as these activities will have a multiplying effect on activities that have already been implemented.

Highest Priority

- **Leverage learnings from innovation experiments and scale up to all FTCs.**
The authors recommend that the MOARD and regional governments work together to take success cases from innovation experiments and initial innovative FTCs and link these cases to other DAs and FTCs; the MOARD should encourage farmer visits and DA visits to innovative regions to spread best-fit practices and successful models that have been created, showing the roadmap to sustainability and revenue generation for a broader set of FTCs. These scale-ups will potentially be quite resource-intensive and may be an opportunity to leverage donor relationships for capital investments.
- **Launch a team to develop a performance measurement and evaluation scheme.**
The authors recommend that the MOARD launch a team to develop a systemwide performance management system, focused on farmer impact and driven primarily by farmer review. The system could work hand in hand with farmer organizations, rating DAs, SMSs, and such on impact measures. This system will ensure that key outcomes in extension are achieved and incentivized appropriately. These activities directly relate to recommendation theme 6 and should be led by the MOARD. Limited resources will be required.
- **Invest in a strategic set of resources to lower cost and increase extension efficacy.**
The authors recommend that the MOARD analyze and invest in strategic resources that can increase the impact of extension in a cost-effective way. Such resources could include motorbikes in specific regions, increasing the range of impact DAs can have (and potentially scaling back to one or two DAs per FTC in some regions due to distance between farms, and so on.). These resources should be carefully considered from a cost–benefit perspective and

should be region- or *woreda*-specific due to dramatic differences in circumstances from FTC to FTC.

Lower Priority

- **Foster greater linkages between research, ATVETs, and extension, directly related to new extension models and approaches.**

The authors recommend that the MOARD, working in partnership with research and ATVETs, support increased extension linkages, mandating farmer participation and FTC visits by key research and ATVET personnel. As extension shifts to a broader set of farming systems, research and ATVETs will require greater focus and ties to farm-level innovations. Enabling these linkages will likely have limited resource requirements.

- **Develop performance incentives for DAs and SMSs to encourage high performance.**

The authors recommend developing a set of systemwide performance incentives to encourage high performance from DAs, SMSs, and FTCs. Linked to an impartial, transparent performance measurement system, these incentives, both monetary and nonmonetary, should be rolled out across regions and celebrate farmer impact on extension. Incentives should be tied to important principles of farmer-driven, market-oriented extension and should be reviewed and voted on by farmers. Additional resourcing investments, loan prioritization, and so on could potentially be linked to the highest-performing groups as well. These incentives would likely have low resource requirements.

The Way Forward

Implementation of the full set of recommendations will take time and will require coordination among a range of actors, including public and private entities, donors, and NGOs. Although many of the recommendations and activities described above require appropriate timing and partnership to be implemented, there is a set of actions that the MOARD can take on, of its own volition, to prepare for success as more extensive pieces of this extension transformation are put into place. These actions can be implemented as soon as possible by the MOARD and are low-cost, high-impact ways for the extension system transformation to gain traction and illustrate to the broader community that the MOARD is serious and committed to action on extension efficacy.

Drawing on the full range of study findings and strengthened by extensive stakeholder engagement, this set of recommendations and the implementation plan can be viewed as a roadmap for strengthening and improving the Ethiopian extension system. To be successful, a range of actors, including the GOE, the MOARD, the donor and NGO community, and the private sector, will need to work together to implement the various components and programs. Ultimately, the transformational change required for greater extension impact will need to come from the Ethiopian people—from farmers and DAs at the front line of extension to the highest policymakers.

The research team recognizes and commends the Ethiopian government for its commitment to improving the agricultural sector and alleviating rural poverty. It is clear that there are significant opportunities for change and that there is a strong base on which these improvements can be built.

Much work has been accomplished with regard to extension in Ethiopia. However, much more remains to be done. Further strengthening the extension system can have a positive impact on the lives of men, women, and youth in rural Ethiopia—impact that helps maintain national food security while at the same time increasing farm income to improve rural livelihoods.

APPENDIX A: STAKEHOLDER FEEDBACK SUMMARY

**Panel Discussion Follow Up / Expert Panel
Summary of Major Points
Wednesday, July 16, 2009
ILRI Campus, Addis Ababa**

- There should be more focus on how the extension sub-system relates to and integrates with other sub-systems in the agricultural and education systems. We should look at the overall enabling environment.
- Look at trade-offs within the system and financial sustainability in terms of cost. The presentation is focused onto opportunities of investment without critical analysis of the cost of the existing one. We need more data on effectiveness of resource allocation.
- The report should not continue the tradition of focusing only on crop extension, leaving out livestock, non-cereal crops, irrigation, women farmers, and pastoralists.
- Take a look at other extension providers (e.g. NGOs), other countries (e.g. India), and alternate methods; there are opportunities to draw lessons from others.
- Draw out ways to enhance the roles of other players, such as farmer organizations and the private sector
- Be clear if authors are trying to strengthen what is existing, or proposing something different for the extension system.
- Give some indication of how to prioritize recommendation areas.
- Do not neglect productivity issues completely for market orientation in extension
- Use better visual tools to tell a more dynamic story in the report.

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