

Review and Recommendations for Strengthening the Agricultural Extension System in Ethiopia



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This report was commissioned by the Bill & Melinda Gates Foundation at the request of the government of Ethiopia. The authors are solely responsible for the findings and conclusions contained in the report.

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A full list of abbreviations has been included in the appendix for the reader's convenience.

Executive summary

CONTEXT FOR THE STUDY

Eighty-three percent of the population 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 46.3 percent of gross domestic product (GDP) (World Bank Group 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. The basic direction of agricultural development includes the utilization of human labor, proper use of agricultural land, the combining of endogenous and exogenous knowledge (a “foot on land”); focus on innovations adapted to agro-ecological 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.

In early 2009, the Bill & Melinda Gates Foundation (BMGF) was requested by the Government of Ethiopia (GOE) to undertake a review of agricultural extension in the country. The purpose was to provide a review of the strengths and constraints of the public extension system, and to give suggestions on “best fit” solutions and their scale-up opportunities, in close consultation with the government and other stakeholders.

A team of extension scholars and international management experts conducted a review of the Ethiopian extension system from May-July, 2009. The review used a variety of analytical tools to develop the overall findings, including extensive field visits to 6 of 9 regions in Ethiopia; interviews with 100+ extension personnel, extension experts, nongovernment organization (NGO) groups, government representatives, farmer and farmer groups; and a holistic literature review on Ethiopian extension.

Stakeholder review and inputs were critical to the creation of this report and its findings. International and local extension experts and stakeholders were consulted on several occasions, including a briefing at the start of the review period to gather data and test in-going hypotheses, and at the conclusion of the

formal review period. The team also held a three day stakeholder workshop that gathered feedback and ideas from a group of over 80 parliamentarians, MOARD staff, and front-line extension personnel. The insights generated from these various stakeholder meetings were instrumental in developing the findings and recommendations of this work.

EXTENSION ASSESSMENT FINDINGS

The study assessed strengths and constraints in the field-level extension system, the agricultural technical and vocational education and training (ATVET) system, and the extension institutional environment. The study also briefly considered the overall enabling environment within which extension operates. High-level findings are presented below, with extensive detail provided in the main report.

Findings at field-extension level

The field-extension service has a strong foundation of Farmer Training Centers (FTCs) and trained Development Agents (DAs) already in place in the field. Roughly 8,500 FTCs have been created throughout Ethiopia, and about 63,000 DAs have been trained in total, with a reported 45,000 staffed on location. *Woreda* and regional offices are adequately staffed. DAs and *woreda* staff have strong technical skills, and are generally trained as specialists. Pockets of entrepreneurialism and innovations exist in specific FTCs and *woredas*.

Acknowledging these strengths, several sets of constraints were identified within the field-level extension system that will require attention. These constraints show great variance by region, with some regions employing good practices while others lag behind in implementation of proper extension approaches. Basic infrastructure and resources at FTC and *woreda* level remains a major constraint, particularly related 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 SMSs in the FTC and *woreda*, 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.

Findings at ATVET level

The team employed a similar approach at the ATVET level to identify strengths and constraints. Strengths at 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 *woreda* level, limited linkages to broader educational system and research system in Ethiopia, and general lack of resources to effectively transmit fully required skill-set to DAs.

Findings at enabling environment level

The country-wide 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, market access, and credit, if extension is to achieve its full potential impact.

SUSTAINABILITY CONSIDERATIONS

The team recognized extension system sustainability as an overarching challenge to address in the review. The report offers specific considerations for sustainability in the short and long term.

In the short term, the GOE will need to manage sustainability at the FTC level through improved resource efficiency. This paper proposes that the GOE introduce responsibly administered revenue-generating activities at appropriate FTCs (already being pursued in some innovative *woredas*) that can provide additional funds for operational resources and practical demonstration of effective farming practices. The legal framework to support this approach will need to be developed, but has some precedent in Ethiopia's teaching sector.

In the longer term, the extension system in Ethiopia will need to continue to evolve to meet the needs of its farmers and achieve an appropriate level of sustainability. Other developing nation experience (e.g., India and China) gives examples for how the extension system might be expected to evolve in the future. Three particular changes – greater emergence of fee-for-service extension (e.g. for artificial insemination); new actors, including private-sector participation in

extension; and changes in broader enabling environment – will impact and supplement the overall public extension system’s delivery of services in the future. In the near term, however, government-led public extension will need to continue to play the primary role. These changes have the potential to strengthen the overall extension system and allow for public extension to focus on areas where it is most needed in a sustainable fashion.

RECOMMENDATIONS

The team has developed a set of recommendations and potential change actions across the extension system. 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 impacting an important aspect of the extension system:

1) Strengthening farmer-driven orientation across all levels of extension

The overall management and orientation of the extension system must be driven by farmer needs, from the types of services offered at the FTC to the overall strategic direction set by regional and federal policy makers. 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. While a policy of decentralization has been followed by the MOARD, the implementation has not yet been consistent across all regions and more could be done to increase the voice of the farmer in the system.

2) Broadening of extension services offered

This report has described in depth the great variation in services required by the farmers, pastoralists, agro-pastoralists, women, and youth of Ethiopia. Extension will need to broaden services to meet the subject-area needs for all these groups, particularly as incomes continue to grow and more farmers seek to emulate emerging “model” farmers, demanding 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 will need to be strengthened in order to have greater farmer impact – both capital resources such as adequate buildings and demonstration plots as well as the operating capacity of the FTC to provide

farmer demonstrations. Recommendations include an increased focus on sustainability activities (e.g., increasing responsibly administered revenue-generating demonstrations and potential for financially sound loans and micro-loans for operational activities) at the FTC level.

4) Improving DA knowledge 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 will ensure that the system continues to serve farmers effectively.

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 (e.g., messaging and support from *woreda* and MOARD that focus on important nature of DA services, development of a clear DA career path) strengthen the overall implementation of extension services at farmer level.

6) Implementing performance culture and transparency at all levels of extension

Several recommendations identified as critical to increasing farmer impact (e.g., identifying metrics to track impact at 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 report recognizes the importance of a system-wide approach to extension. Recommendations focused on linkages between extension actors (e.g., strengthening ties between DA and SMS through *woreda* extension resource centers (WERC)) 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 non-extension actors (NGOs, private sector entities) that impact how farmers are served through the system.

Each recommendation theme has corresponding activities as illustrated in Exhibit 1 below and detailed in the main report.

EXHIBIT 1. The recommendations are represented by 7 themes

	Themes	Activities
1	Strengthening farmer-driven orientation across all levels of extension	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 3.1- Resource FTCs to basic functioning level ▪ 3.2- Utilize credit to strengthen operations at FTC ▪ 3.3- Strategically invest in add-on resources, innovations
4	Strengthening DA knowledge and capabilities	<ul style="list-style-type: none"> ▪ 4.1- Offer in-service training for DA skill building ▪ 4.2- Re-structure and strengthen ATVET system, curriculum ▪ 4.3- Revise/ strengthen DA apprenticeship/ practical program
5	Improving DA motivation and retention	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 6.1- Launch performance mgmt 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 the extension system	<ul style="list-style-type: none"> ▪ 7.1- Develop Woreda Resource Centers to provide adequate linkage and information opportunities for DAs and SMS ▪ 7.2- Foster improved linkages between research, ATVETs, on-the-ground extension through site visits, farmer meetings, etc

The report recommends activities be sequenced across three horizons:

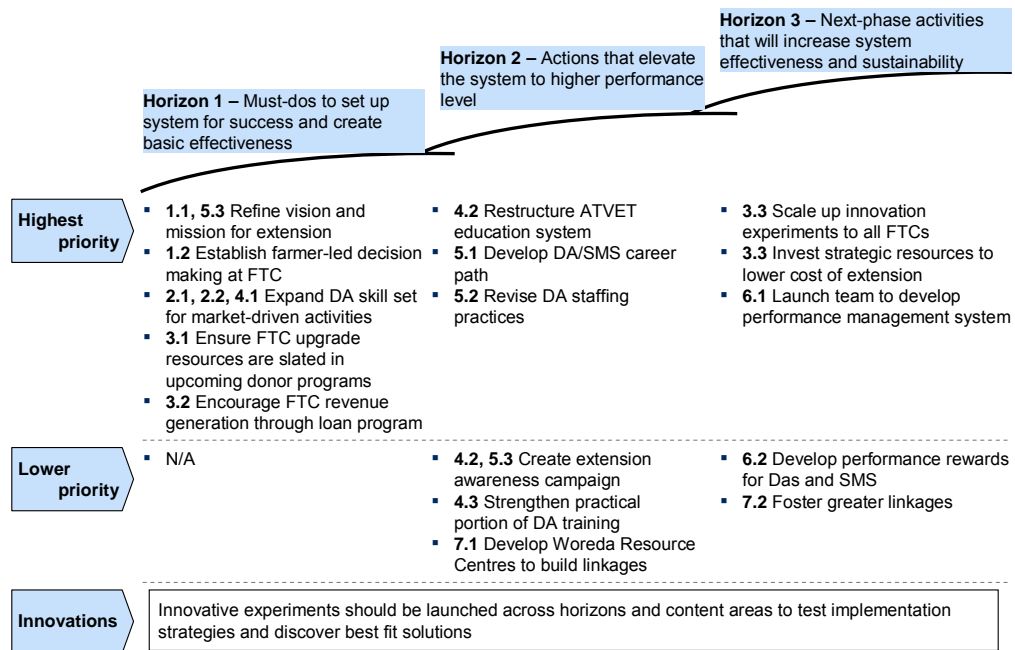
- **Horizon 1** activities are “must-do” initiatives that spur basic extension system effectiveness in the short-term – in essence those actions and recommendations that are of the highest priority and can have the highest impact on Ethiopian extension in the near term. Some of these activities require action from the Government of Ethiopia and MOARD; others will have a partnership focus with donor organizations that are active in agriculture.
- **Horizon 2** activities push the extension system to a higher level of efficacy, building on the basic functionality that is achieved through horizon one activities. These activities are not as urgent or immediately impactful as

those activities in horizon one, 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 get the full impact of extension.

- **Horizon 3** activities strengthen the effectiveness and sustainability of the Ethiopian extension system as it grows and develops. These activities should be pursued after the extension reaches the next level of efficacy, as these activities will have a multiplying effect on activities that have already been implemented.

The breakdown of activities across horizons is represented in Exhibit 2 below.

EXHIBIT 2. The recommendations have been prioritized across three implementation horizons



Activities and primary actors are described in detail within the report. We conclude the report with a “near-term” checklist for the MOARD, with activities designed to gain momentum on areas of critical importance.

For implementation to be successful, a range of actors including the GOE, the Ministry of Agriculture, 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 within Ethiopia – from farmers and DAs at the front line of extension to the highest policy makers.

As the report describes, much work has been accomplished with regard to extension in Ethiopia. However, much more remains to be done. We are therefore excited about the potential impact that further strengthening the extension system will have on the men and women farmers across Ethiopia, impact that both helps to maintain national food security while at the same time increases farm income to improve rural livelihoods.

1. Introduction

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 46.3 percent of gross domestic product (GDP), and up to 90 percent of foreign export earnings.

On the whole, Ethiopia has ample resources for agriculture. Ethiopia has 111.5 million hectares of land. Whereas it has 74 million ha of total land arable, only 13 million ha are being used.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 amount of biodiversity, with several different economically important crops indigenous to the country (e.g., teff).

In spite of these resources, many challenges confront policymakers and other agents of change. These include the growing demand for food and 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 2008³, and 7.5 million people are chronically food-insecure and must receive assistance through a social welfare scheme⁴).

The agriculture 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 curtailed support to 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 area cultivated and 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 (MOARD 2001). The basic direction of

agricultural development includes the utilization of human labor, proper use of agricultural land, the combining of endogenous and exogenous knowledge (a “foot on land”); focus on innovations adapted to agro-ecological 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 the supply remains a bottleneck in the system. The professional capacity of extension has also dramatically increased; over 63,000 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 about nine months’ training).

However, while there have been great strides in agriculture, productivity remains low relative to potential yields. 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 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 recent 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 increased focus on marketing, high-value crops, and related inputs.

To help improve the agricultural extension system, the Bill & Melinda Gates Foundation (BMGF) was requested by the GOE to undertake a review of agricultural extension in the country. The purpose was to provide a review of the

strengths and constraints of the public extension system and to give 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. These include:

- 1. Participatory Demonstration and Training Extension System (PADETES)** (EEA 2006). In 1995, the government introduced PADETES, a system that now reaches some 35 to 40 percent of farm households in rural areas. The 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.
- 2. Farmer Training Centers (FTCs).** Since 2002, roughly 8,500 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 are around livestock, crop production, and NRM.
- 3. Agricultural Technical and Vocational Education.** In 2000, the government invested in agricultural and technical vocational education and training (ATVET) centers to train DAs charged with carrying out agricultural extension activities with farm households. By the close of 2008, the program had trained over 63,000 DAs at the diploma level.
- 4. 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 agro-ecological zones and to support a DA corps of over 60,000.

The report is organized as follows. Section 2 describes how the review was undertaken. Section 3 gives background on agriculture and extension in Ethiopia, giving a summary of previous studies and focusing on the current PADETES extension system, as well as providing information on how to transform extension systems. Section 4 provides an overall assessment at the field level of the Ethiopian extension system, looking specifically at 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 covers the enabling environment and its importance for extension to work effectively and efficiently. Section 7 describes alternative methods and approaches for system sustainability and “best fit” solutions to address constraints found in the system. Finally, section 8 provides the overall set of

recommendations and implementation guidelines for strengthening and improving the Ethiopian extension system.

Note to the reader: Ethiopia's diverse agro-ecological zones mandate a range of farming systems, with crop farmers, mixed crop and livestock farmers, pastoralists, and agro-pastoralists all participating in the agriculture system. This report will use the term "farmer" to encompass this diverse set of actors and the institutions that serve them; for example, Farmer Training Center encompasses the range of centers built, which include those built for pastoralists. The team explicitly notes that extension must be available to serve farmers of all types.

2. Methods

The BMGF contracted a team of extension scholars and international management experts to conduct a full review on the Ethiopian extension system. Throughout the review, MOARD management provided consistent support, oversight, and input. BMGF also provided support in 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), and relevant local institutions; bi/multilateral donors; NGOs; and national agricultural universities.

DATA COLLECTION METHODS EMPLOYED

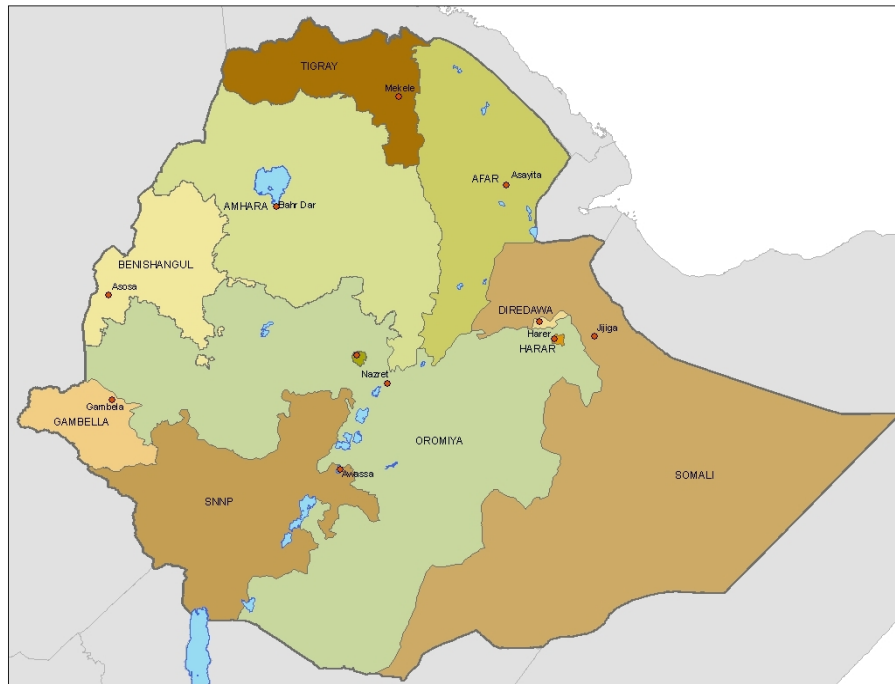
Methods used to collect information for the study included a desk review of relevant literature, including successful case studies from several Asian countries; informant interviews; stakeholder consultations; focus groups; and field visits to six of the nine regions of Ethiopia. A pre-test of data collection 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 (Exhibit 3 shows a map of Ethiopia). Six regions and nine *woredas* were identified by criteria to cover a diverse set of agro-ecologies, 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 team interviewed farmer and farmer groups, regional heads, office heads, Subject Matter Specialists (SMSs), and DAs,. At the ATVETs, the team interviewed administrators, instructors, and students. The regions covered were:

- 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*
- Oromia Region: Addis Ababa City, Assela Town, and Tiyo and Chiro *woredas*
- Southern Nations, Nationalities, and People's Region (SNNPR): Hawassa City and Dilla Zuria *woreda*

- Tigray Region: Mekelle City and Wukro and Atsibi *woredas*

EXHIBIT 3. Map of Ethiopia showing the major regions and regional capitals



Source: Ethiopia Strategy Support Project

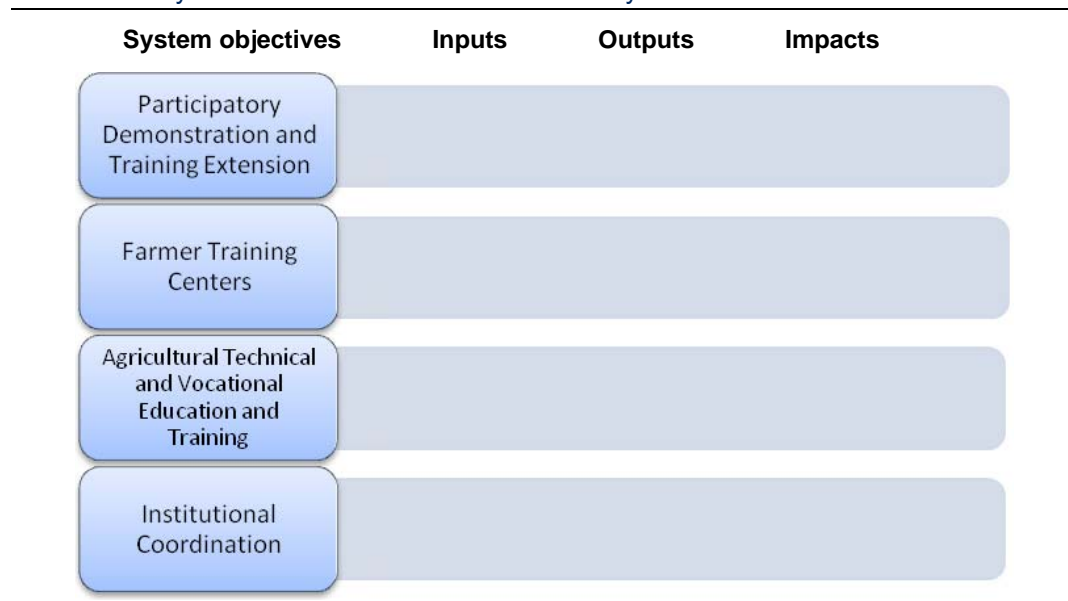
The reviewers also documented complementary programs and projects that interact with the public extension system. For instance, the International Livestock Research Institute (ILRI) has a country-wide project called Improving Productivity and Market Success (IPMS). The goal of IPMS is to bring about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

Finally, the Alliance for a Green Revolution in Africa (AGRA) is developing an initiative to aggregate the crops, seed, policy, soil health, and markets programs for four major “bread basket” regions in Ethiopia. While the project is still under discussion with the Ethiopian Institute for Agricultural Research (EIAR), the team had conversations with the lead EIAR researchers to find out more about the upcoming initiative and to discuss extension’s role in Ethiopian agriculture.

ANALYTICAL METHODS AND APPROACHES

The team 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 team employed a systems analysis across four major components of the extension system.

EXHIBIT 4. Systems framework for extension analysis



The team also employed an additional analytical lens to the findings based on private sector experiences in transformational change programs. This framework, designed to analyze strengths and weaknesses of a transformation change program like an extension system, allowed the team to analyze the different working components of Ethiopian extension as they related to systems and management, knowledge and capabilities, and infrastructure and resources. This

approach also introduced the concept of the enabling environment in which extension operates, which the team briefly analyzed.

Beyond the strengths and constraints analyses completed by the team, “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 team visited; these best-fit solutions were enriched by the team’s knowledge and experiences of other country extension systems.

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

This report was presented to the MOARD for professionals and experts to provide comments. The team continued to receive feedback on the write-up by regular briefings with MOARD staff, cross-checking with local experts, and by team meetings. A draft copy of the report 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 report. A follow-up consultation to gather feedback was held with a panel of Ethiopian extension experts and scholars who had briefed the team at the beginning of the study.

Following various reviews, a stakeholder meeting was held for extension personnel, researchers, NGOs, and policy makers to validate and refine the findings and recommendations for the final version of the report. The purpose of this was to ensure that there was wide stakeholder agreement on the way forward. In this regard, the team held a 2-1/2 day workshop in Adama with DAs, SMSs, regional bureau heads, extension heads, MOARD staff, research staff, ATVET heads, and Sasakawa-Global 2000 staff to brief them on the findings and get feedback and validation, and to go into detail with these stakeholders on how to actually operationalize the recommendations.

These stakeholder meetings were critical in helping the team to refine the findings and develop recommendations that were “best fit” for the Ethiopian context. In particular, stakeholder and expert feedback on the Ethiopian enabling environment, DA motivation and retention practices, the need for a “system-wide” view of extension, and role of the generalist versus specialist DA in

extension led to specific findings and recommendations that strengthen the report. A high-level summary of stakeholder feedback is included in the appendix.

In sum, the study review attempted to ensure rigor and reliability of results through 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 on agricultural extension in Ethiopia

This section provides detail 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 there are several excellent reviews of past Ethiopian extension systems already existing (see Abate 2007; EEA/EEPRI 2006; Kelemework 2007), this paper just touches briefly on the various systems and programs of government extension in Ethiopia. (See appendix for an annotated bibliography detailing the various papers and studies reviewed and additional findings from this extensive literature review).

Ethiopia has had government agricultural extension services since the 1950s, when a model similar to the United States Land Grant approach was used, where 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, there were several national development plans 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, while still focused on improving living standards, based its approach on agro-ecological 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 1971-1975. The country then moved into a socialist period. During this time the government implemented the “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).

From around 1986-1995, there were various new programs, such as the National Program for Food Self Sufficiency (1986-89), Modified Training and Visit (T&V) Approach, and the Peasant Agriculture Development Extension Projects (PADEPs) (1986-1995) (Abate 2007). Following the downfall of the socialist regime in 1991, the focus changed to a free market economy.

In 1993, NGO Sasakawa Global 2000 (SG-2000) promoted the use of productivity-enhancing technologies and access to inputs and credit, coupled with training using 1/4- to 1/2-ha 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 their on-farm demonstration plots, SG-2000 showed that – with sufficient inputs and supervision and management – farmers could double or triple their cereal yields of maize and wheat.

The success of the SG-2000 pilots led in 1995 to the transitional government adopting the PADETES for extension. This was based in part on the T&V system as well 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 package to livestock, high value crops, post-harvest technologies, and agro-forestry. PADETES also uses a menu-based approach rather than the former package approach.

The PADETES program had a massive increase in the number of adopting farmers, from 35,000 in the beginning to over 3.6 million. This program was closely monitored by the government. However, the high 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 the original demonstration plots, due in part to a lack of sufficient supervision by the extension staff.

Identifying challenges in the PADETES program resulting from insufficient extension staff, the government realized the need for additional human resources in extension 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.

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. They are expected to form an important node between extension and farmers in the agricultural sector. FTCs are managed at the *kebele* level, but 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 natural resource management) and supported by a peripatetic 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/her field of specialization. He or she is also expected to give modular training to 60 farmers every six months in his/her field of specialization (Ministry of Agriculture and Rural Development 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 capacity building of human resources in extension (ATVETs); supporting farmer training centers (FTCs) with physical infrastructure; agricultural research; and institutional capacity building. The RCBP also has been implementing institutional innovations such as decentralization and participatory financing mechanisms in a few select *woredas*.

Other projects such as IPMS are also supporting local extension in selected areas. The project works in 10 Pilot Learning Sites (PLS) to develop a community-based market-oriented agricultural program. This program will help to 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 given to farmers and communities

around FTCs that are located in the farming systems for which the market priorities are identified (IPMS 2005).

TODAY'S INSTITUTIONAL ENVIRONMENT

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

- **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 overall strategy, the MOARD establishes the overall national extension policy, providing primary financial support for the extension system and backstopping to the regions in terms of 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 semi-autonomous EIAR, which has the mandate to generate, develop, and adapt agricultural technologies that focus on overall development and needs of users (Beintema and Solomon 2003). EIAR is responsible for 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 among 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 Technology and Industry, the Ministry of Capacity Building (www.mocb.gov.et), the Ministry of Education, Ministry of Health, and the Ministry of Transportation and

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

- The Food Security Coordination Bureau (FCSB) is another important rural institution. It classifies all *woredas* in Ethiopia as food-secure or food-insecure due to the chronic problems of food security in the country. The Productive Safety Net Program (PSNP), one of the largest social protection programs in Sub-Saharan Africa (SSA), works with the chronically food insecure *woredas* (Gilligan et al. 2008).
- Regional, *woreda*, and *kebele* institutions:
 - Each region has a Bureau of Agriculture and Rural Development (BOARD). The regions and their BOARDS are responsible for agriculture and rural development policy implementation, coordination, and evaluation. Each BOARD has a director and a number of technical and administrative staff, including department heads. These personnel provide technical and administrative backstopping, as well as supervision and monitoring for the *woreda*- and *kebele*-level extension offices. Each region is divided into major agro-ecological zones, which provide 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 the *woreda* Offices of Agriculture and Rural Development (OOARDS). 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 et al. 2007). The largest sector, agricultural development, is responsible for extension services and is usually divided into crop production, livestock production, NRM, and extension teams (Gebremedhin et al. 2007). The OOARD represent a more operational level in terms of reaching smallholder men and women farmers and pastoralists. They do so using a cadre of experts or SMS (who are also found at the regional level).
 - At the *kebele* level are the FTCs, at which are posted 3 DAs.
- Other institutions at the *woreda* and *kebele* level include farmers' cooperatives for input supply or marketing; community-based organizations; NGOs; and private firms (e.g., traders or transporters) (see sidebar, *Other actors influencing extension in Ethiopia*).

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 agriculture sector.

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. 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 para-veterinary 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 (ACDI/VOCA, 2005). 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 of groups (Iquob). These groups provide linkages to outside actors and a mechanism for information sharing. 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 non-governmental organizations (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 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 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 often planned and implemented in consultation or collaboration with the regional agricultural bureaus or agricultural development offices at the woreda level.

Source: Spielman et al. 2006

STATE OF EXTENSION INPUTS AND RESOURCES TODAY

From the data and the team findings, the GOE appears committed to developing the largest agricultural extension system in SSA. Currently, it is estimated that 8,500 FTCs have been established at the *kebele* level, with roughly 2,500 of these FTCs reported to be fully functional at the present time (MOARD 2009A). In addition, it was reported that there are about 45,000 DAs currently on duty at the *kebele* level, including about 12 to 22 percent women DAs dependent on region (MOARD 2009A). It was reported that 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 63,000 DAs have graduated from the ATVETs as of 2008, with 12 percent of them being female (MOARD ATVET Department 2009). 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.

It should be noted that the vast majority of the currently employed DAs are located in four regions, including Oromia (19,654), SNNPR (11,061), Amhara (10,196) and Tigray (2,067)⁵. As shown in Exhibit 5, 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 one 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 country-wide. 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.

EXHIBIT 5. Estimated number of FTCs and DAs in Ethiopia

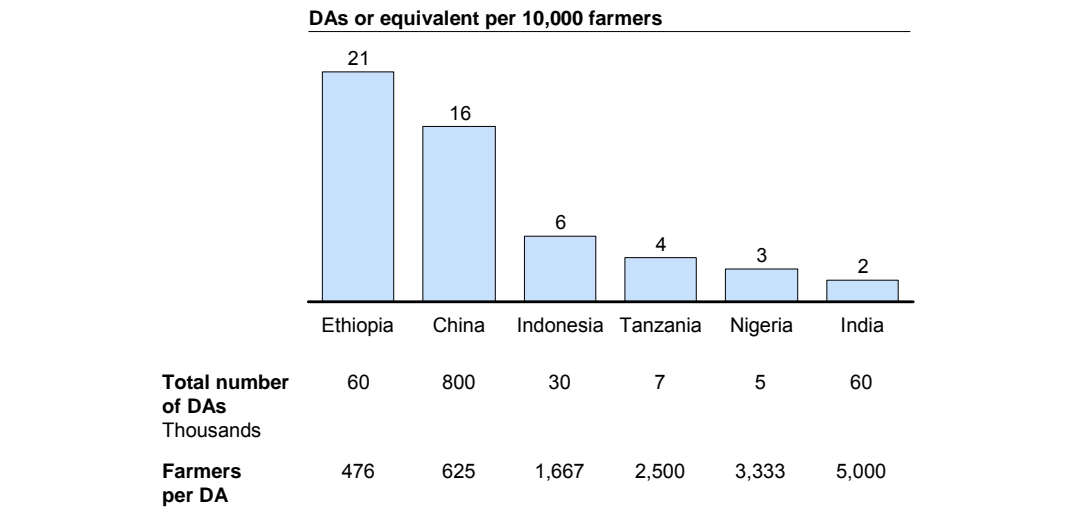
Region	FTCs			DAs		
	FTCs required	Established FTCs	Functional FTCs	Male DAs	Female DAs	Total DAs
Tigray	602	588	55	1,879	188	2,067
Oromia	6420	2,549	1,147	?	?	19,654
Amhara	3150	1,725	318	7532	2,664	10,196
SNNPR	3681	1,610	857	9,707	1,266	11,061
Afar	558	3	?	?	?	748
Somali	?	2	?	1167	102	1269
Harari	17	5	?	47	5	52
Dire Dawa	25	7	?	73	15	88
Benishangul-Gumuz	?	?	?	?	?	677
Totals	14,455	6,489*	2,384	1287	122	45,812

*MOARD estimates total established FTCs currently at ~8500- number has increased since table published

Source: Ministry of Agriculture and Rural Development 2009a

Given that there are approximately 21.8 million adults (aged 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; it should be noted that this would be one of the strongest extension agent:farmer ratios found in the world today (see Exhibit 6).

EXHIBIT 6. Comparative extension investment in select developing countries



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, including crops, livestock, and NRM. In the past, most of the staff assigned to these SMS positions began their extension careers at least 5 to 10 years earlier.

ALTERNATIVE METHODS AND APPROACHES TO EXTENSION

The position that this report takes in looking at alternatives systems and methods for delivering extension is that 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 structure and approach, has to 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 a review of alternative extension approaches and methods that have been used in different countries see sidebar, *Alternative extension approaches*). 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 agro-ecological zones. The Japan International Cooperation Agency (JICA) is partnering with agricultural research centers at the federal and regional level 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 started experimenting with other extension approaches such as farmer field schools, as well as other techniques, such as 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).

ALTERNATIVE EXTENSION APPROACHES

Farmer field schools were introduced into sub-Saharan Africa in the mid-1990s. Concept of FFS came from Asia, where they were developed to promote integrated pest management programs. In Africa, FFS are being used for a variety of activities, including food security, animal husbandry, and soil and water conservation. They are even moving beyond agriculture into health (HIV/AIDS) and other relevant rural topics.

A related concept to FFS is the farmer study circles. Study circles, which are much more informal than FFSs, provide opportunities for group exploration and learning, and to gain knowledge on whatever topic members decide. These farmer groups meet regularly, with no external “expert” (although resource persons may be called in or facilitators may guide the groups). Study circles allow a forum for people to learn and solve their own problems. The Swedish Cooperative Centre focuses on human rights, improved livelihoods, and increased incomes, and has developed at least 68 different study circle guides in SSA for issues ranging from crops to HIV/AIDS (www.sccportal.org).

Other communication methods that are expanding rapidly in many countries are information and communications technologies (ICT). These ICTs are increasingly being used in many countries, such as China, India, and Chile; on the other hand, many Sub-Saharan African countries have lagged somewhat behind due to their lack of basic ICT infrastructure. However, this situation is now rapidly changing in Ethiopia and many other SSA countries; therefore, there are increasing opportunities to harness these ICTs to expand the impact of extension and to address other rural development issues. However, some good ICT examples exist; for instance, Kenya and Uganda are using mobile phone services to provide “cheap” messages directly to farmers about crop price information via text messaging. In Tanzania, there are “market spies” or farmers who visit local markets and remain in direct contact with other farmers in the village using mobile phones.

The decentralized, farmer-led, market-driven extension model used in India may provide useful insights to strengthen extension systems in Ethiopia and other SSA countries. The Agricultural Technology Management Agency (ATMA) model successfully increased average farm income by about 6%/year (against only 1% annual increase in non-ATMA districts), as well as creating rural employment due to the post-harvest handling of high-value products (see: Singh, Swanson, & Singh, 2006). In addition, ATMA was designed to integrate extension programs across several line departments, to link research and extension, and use bottom-up planning procedures that directly involved farmers in decision-making. Many judge it as a successful model of extension reform (Anderson, 2007). In helping farmers diversify their farming systems into appropriate high-value crops/products, four axioms were considered essential in developing a market-driven extension system. These are (a) don't encourage farmers to produce without a market; (b) consider available transport in deciding which products can be successfully transported to markets (e.g., if there are not all weather road, don't produce perishable products); (c) Pay attention to agro-ecological conditions for crops; and (d) diversify the production of high-value crops/products to avoid market saturation.

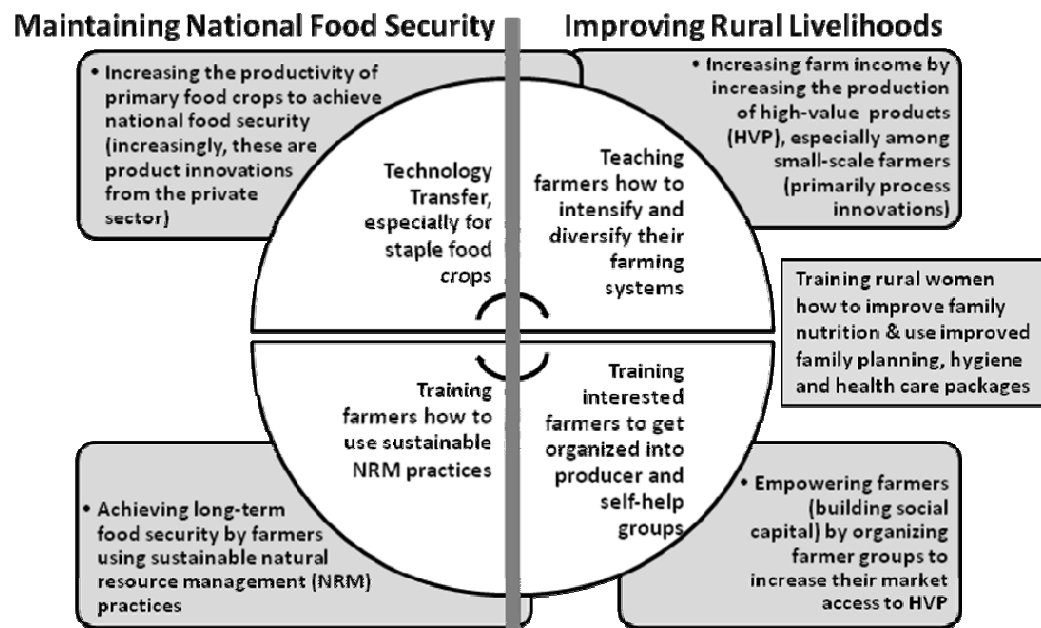
There are also innovative approaches to financing extension services. The creation of a Trust Fund (Ghana) and Basket Funding (Tanzania) allows for the pooling of funds and distribution to end-users based on demand. In both cases, stakeholder forums, consisting of farmer groups, are brought together in providing required services from either public or private bodies. Under this system, farmers are empowered to identify and use selected qualified service providers (Government of Kenya, 2005). Other successful methods include levies on export commodities, community-driven development funds (Guinea and Kenya), and contracting by the government (Mozambique) (Alex, Byerlee, Helene-Collion, & Rivera, 2004).

Furthermore, extension financing can come through decentralization, involvement of farmers' associations and NGOs, contracting-out of extension services, public-private partnerships, privatization, and embedding advisory services in other types of contracts (Anderson, 2007). More information can also be found in the Agriculture Investment Sourcebook's Module 3 (World Bank, 2005).

Source: Davis, 2008

In considering alternative extension approaches, the team also considered lessons from other countries that could inform the report. Exhibit 7 illustrates how selected Asian countries (e.g., 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 (e.g., 8 percent GDP growth in Ethiopia during 2008), consumption patterns begin to change toward more high-value crops (e.g., fruits, vegetables, spices), livestock (e.g., meat, milk, eggs) and other products (e.g., 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.

EXHIBIT 7. Key functions of an innovative extension system that seeks both to achieve national food security and to improve rural livelihoods



Source: Swanson 2009

However, in pursuing these new high-value crop and livestock products, farmers must get organized 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 health care, especially for their children. The other key area where Ethiopia is making good

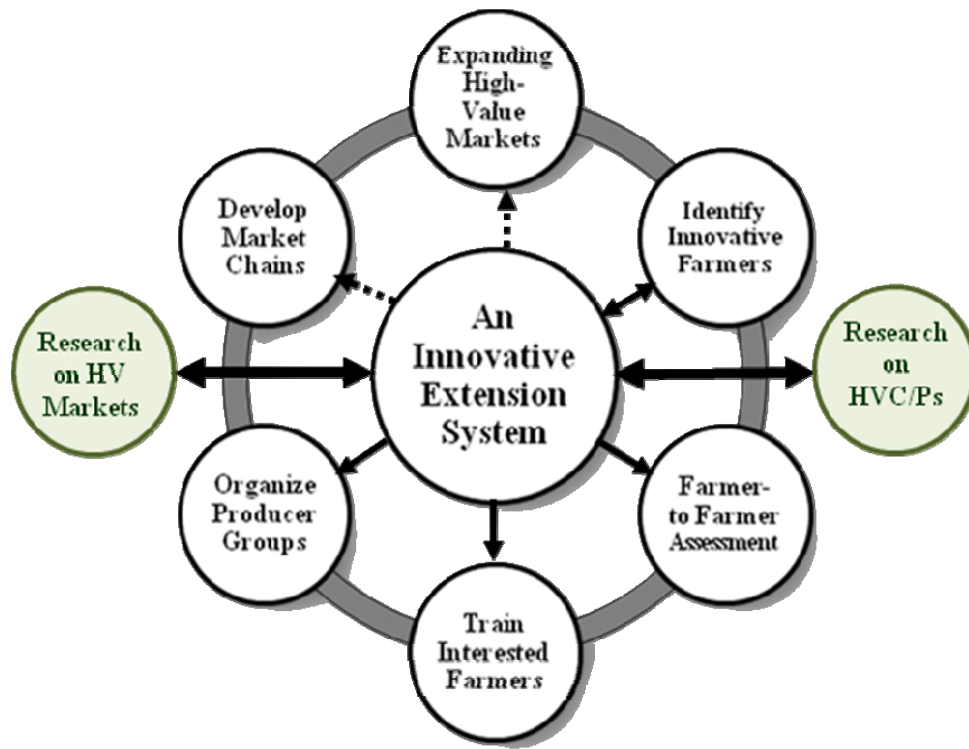
progress is in training farmers how to use sustainable NRM practices. Since most NRM practices require further investments (both labor and capital), increasing farm income becomes a critical factor to enable farmers to make these needed investments. As shown in Exhibit 7, a comprehensive extension system must focus on all four of these closely integrated functions to both achieve national food security and to improve rural livelihoods.

ROLE OF INNOVATION IN EXTENSION

Innovative farmers play a key role 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/products vis-a-vis their specific agro-ecological 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/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 (see box on p 47) – 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 it is challenging for these farmers to handle the potential risk unless markets exist to absorb the different crops and products. As markets expand for these different crops/products, many of these enterprises become scalable.⁶ Here, as shown in Exhibit 8, 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 a number of these enterprises among different groups of farmers, given land and labor availability, gender, and farmer interest.

EXHIBIT 8. Moving toward an innovation-driven extension system to increase farm income



Source: Swanson 2009

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/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 (i.e., 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 since, in most cases, even innovative farmers do not have the most up-to-date information and technology for these crops/products. The key linkage mechanism in helping the DAs gain

access to this information/technology are 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/products. In addition, as they become aware of these emerging enterprises, these SMSs can facilitate the training of the DA staff (by research and/or the private sector) and then help these 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. Strengthening and transforming the Ethiopian extension system

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. We start with the “front line” of extension at the *kebele* level, analyzing resources and infrastructure at the FTC, knowledge and capabilities of the extension agents, and the management and systems that apply at this level. We 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 to become one of the most intensive systems in the world. The plan is to ultimately establish a Farmer Training Center 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 ha of community land to the FTC, land that can be used to demonstrate and train farmers about new technologies, farming systems, new 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 (e.g., building materials, equipment, animals) and operating cost (e.g., 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 into training and hiring DAs, which is discussed in the

knowledge 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 research 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. Most of the better-developed FTCs were donor-financed; however, even between regions and *woredas* there was considerable difference between, for example, RCBP-supported FTCs. Many FTCs visited by the team 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 local commitment in building a permanent classroom/office building. Some FTC buildings were poorly constructed and will require continuing maintenance to keep them functional; others were built as permanent structures that are already being used as community centers, and agricultural extension needs to compete with other community activities for space. Most FTCs do not have access to electricity, therefore, only a few have TVs with DVD players and almost none have any other type of advanced teaching equipment (e.g., overhead projectors, screens, computers). In fact, some do not have any teaching material at all. FTCs also have few independent learning materials (e.g., training materials/manuals) that farmers can use for independent learning and support.

Most FTC DFs visited by the team have not been developed or used. While most *kebeles* have allocated 1.0 to 2.5 ha 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 team, the DAs had used only a small portion or none of the farm to demonstrate specific crops or production techniques, and in some cases the demonstration was a failure (e.g., water management). 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. In summary, with one exception, none of the DFs that the research team visited are currently being run as effective teaching tools, including revenue generation, to demonstrate to different types of farmers how they can increase their farm household income.

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. The availability of operating resources is 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 both 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 different 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 by 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 (see sidebar, *Innovative FTC in Atsibi, Tigray*).

INNOVATIVE FTC IN ATSIBI, TIGRAY

Sustainable “Model FTCs” are already demonstrating the impact that farmer-driven, market-oriented approaches can have in extension. At an FTC the team visited in Tigray, the senior DA is showing farmers how to run the demonstration farm like a business, buying and selling different products to farmers (e.g., improved breeds of sheep, beehives, chicks) and local markets (fruit, vegetables and milk), and then using these revenues to finance on-going extension and training activities. In addition, the success of this FTC has resulted in the further development of their training facilities, with local farmers donating their time, rocks and other building materials to actually construct these facilities. This FTC is being used by both the Tigray Region and Atsibi *woreda* Extension directors to both demonstrate and train DAs from other *kebeles* and *woredas* within the region about how they should develop and use their FTC demonstration farms for both “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, they have 15 sheep (improved breed, including 14 ewes and 1 stud) and now they are selling lambs on credit to local farmers.

On the demonstration farm, 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 3 crops of tomatoes that generated about 10,000 Birr in revenue. In addition, these DAs are training landless youth and women on 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 micro-credit basis. In addition, they have 20 hens to produce eggs for local markets. During 2008, the total operating costs of the demonstration farm was about 16,000 Birr (all on micro-credit from the local cooperative), resulting in net revenues of 7-8,000 Birr. The senior DA expects a significant increase in earnings during 2009.

Only a few FTCs that have received sufficient government or donor support to provide DAs with a suitable place to live at or near the FTC (see photo). 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 (i.e., 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 get married

and start having children. In the photo shown above, the DAs have bicycles so they can more easily visit farmers in their local villages within their *kebele* (RCBP-financed). In most other FTCs, which have not received sufficient government or donor support, the DAs do not have bicycles or some other suitable form of transportation.

An additional issue routinely raised by the DA staff is that they thought they should have appropriate fieldware 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, get 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, with producer groups that will need their continuing support.

Recommendations

4.1.1) Basic training infrastructure.

It is recommended that higher-quality classroom buildings be constructed and equipped for basic operational effectiveness. They have the advantage of not only serving as a functional farmer learning center, but could also serve as a community learning center (e.g., health extension) for each *kebele*. Some of the essential equipment and infrastructure needed at each FTC include 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, 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/products.

4.1.2) 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 as well as resourcing demands of the DF must be addressed. While different management structures can be tested, we

recommend that the senior or head DA within the FTC be responsible for managing the demonstration farm. This head DA will be responsible for the planning and revenue generating activities of the FTC, and then to 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/equip the DFs, in line with local demand. Examples include:

- Suitable livestock buildings and farming equipment for the type of crop and livestock systems typically grown 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 different 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 (e.g., under 20 or under 8 meters).



FARMER FEEDBACK AND DEMAND FOR TRAINING

Farmer input was a critical part of developing the report findings and recommendations. In every region the research team talked to male and female farmers and farmer groups (and agro-pastoralists where relevant). This farmer feedback is incorporated throughout the report. This box gives some more specific feedback from extension clientele.

Farmer's experience with DAs varied by region and woreda, with some farmers giving DAs high marks for their extension services while others complained that DAs were inexperienced and/or not able to offer the services they needed.

Some farmers said that the FTCs have brought about positive change. One agro-pastoralist said that his land used to be idle before he was taught by the DAs to grow food and forage using irrigation from the nearby Awash River. He was benefitting in terms of family nutrition and cash through selling produce.

On the whole, farmers were happy with the services being provided to them. However, sometimes the FTCs did not have the requisite training materials to adequately teach or demonstrate to farmers. As seen above, farmers were ready to innovate and were demanding innovations. In many cases, farmers could not innovate, however, due to lack of seed and credit. These two items were in major demand by farmers. In addition, training needs mentioned by farmers interviewed included:

- Introduction of new fruit tree varieties
- How to increase market access for fruits and vegetables
- How to organize cooperatives, both for marketing high-value crops and accessing inputs
- Farm mechanization to improve crop management
- Water and irrigation management
- Agro-processing of vegetable crops to avoid low prices during the excess production season.
- Beekeeping and dairy management
- Soil and water conservation, including preparing compost
- Organizing farmers to improve access to inputs and markets
- How to use new farm tools to increase labor-use efficiency.

4.1.3) Needed 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 viable over the long term. This will include not only the purchase of livestock, but should also include 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 enhance financial sustainability by the beginning of year 3. An illustrative list follows that gives potential investments and purchases for the FTC; this list will vary by FTC dependent 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 2 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 3 or more modern beehives, with colonies
- Purchase of improved/hybrid seed for staple food crops, plus vegetable seed and fruit seedlings that will be needed to develop a diversified farming system. In addition, funding for fertilizer and other production inputs (e.g., pesticides) will be needed during the first two years of operation.



Hiring of at least 3 full time (landless) farm laborers for the first two years of operation, including one woman specifically assigned to handle the poultry and the vegetable/fruit demonstrations.

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

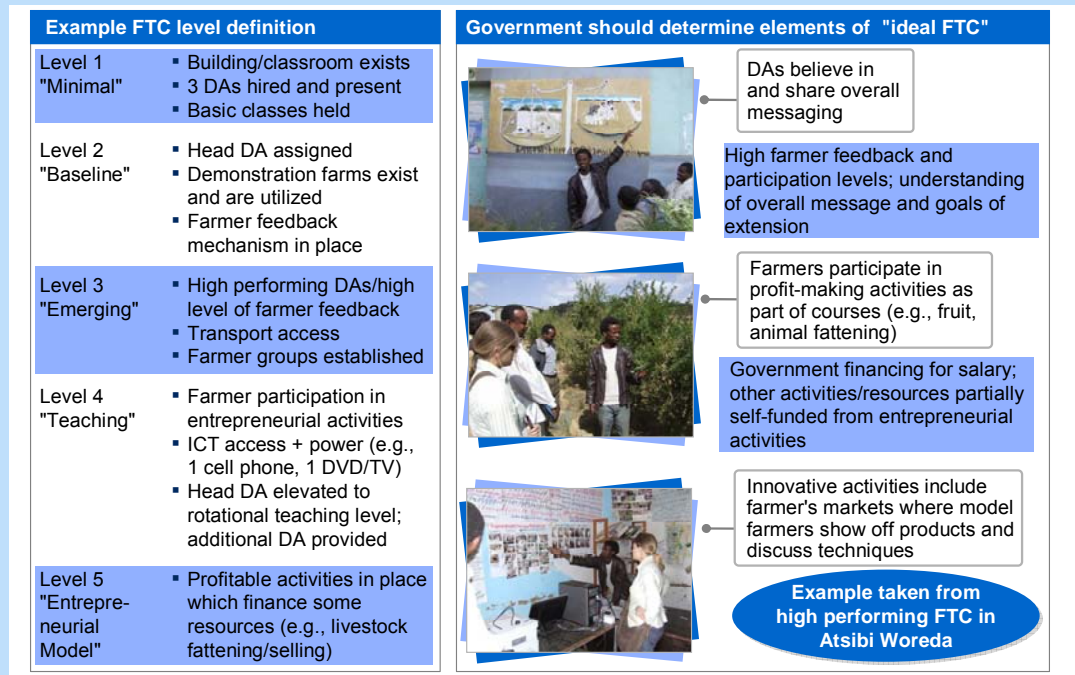
4.1.4) Housing, fieldware, transport and communication.

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 (e.g., 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 fieldware to DAs. When DAs gain access to these facilities and equipment, they should sign an agreement that this furniture and transportation equipment belongs 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.

TRANSFORMING FTCS FROM “START-UP” TO “FULLY OPERATIONAL” EXTENSION HUBS

Based on observations in the field, different FTCS are at different levels of development, based on government and donor investments, as well as the contributions of *kebele* governments and local farmers in helping develop effective FTCS. Figure 7 that follows illustrates these different levels of developing both the FTC physical and human infrastructure. Ideally, all FTCS should move as quickly as possible from level 1, which is the starting point, to level 5, which will typically take 3 or more years to achieve, depending on contributions from government, donors and the farm households being served, as well as the technical and managerial competence of the DAs hired for these different positions.



KNOWLEDGE AND CAPABILITIES (HUMAN RESOURCES)

Strengths

The number of DAs has expanded rapidly over the past five to six years, and has now reached over 45,000 DAs employed in government services. However, at least as important as the number of DAs are their capabilities and their knowledge, which jointly determine their approach to extension. The vast majority of the DA extension workers have the basic technical expertise. When the official training schedule is followed, a DA receives 70 percent of his/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 to all farmer cooperatives 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 project has developed training modules for about 12 different high-value crops and livestock enterprises.

Moreover, we 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 knowledge and capabilities can have is illustrated in the sidebar describing 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 which 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. Salary increases and scholarships are available to high performing DAs, and some regions and woredas employ local reward systems. In addition, there is an annual nation-wide 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. There are also top-performing farmers and DAs 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. For DAs, they are typically evaluated at the *woreda* level. The new evaluation (launched in 2008) gives 60 percent of evaluation say to the community and 40 percent to supervisors. Staff are evaluated on the execution of planned activities, 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) to upgrade the education level. The top five percent of DAs (selected for the best performance) are allowed to upgrade to the B.Sc. 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/livestock products. Most farmers that the team 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 EDRI, 2004).

Constraints

There are serious constraints in the capabilities and knowledge of most DAs: technical skills are rather narrow, and business skills and entrepreneurial mindsets are rare. Furthermore, a “technology push” mindset 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 the DA’s 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 SNNP. This flexible approach to package development has not been implemented across all regions, however, representing a constraint in package design that should be addressed. Package development needs to incorporate farmer needs and be regional-specific, addressing the broad range of farmer needs.

INCREASING EXTENSION'S FOCUS ON WOMEN

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, poultry production, and beekeeping. To increase farm household income, the emerging market-demand for many high-value crop and livestock products fall within the traditional roles and responsibilities of rural women.

It should be noted that when small-scale and women farmers begin diversifying into high-value crop and livestock enterprises, then 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 these interested farmers into specific types of commodity-based producer groups, that are suitable for these different enterprises. Therefore, some of these emerging producer groups in Tigray are actually composed 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.

In contrast to the use of diverse packages in select regions, many regions and the field level extension workers are often disseminating “standard” production practices for the major food crops across the entire region. As a result, little attention is being given by these extension field workers to a more balanced and expanded extension program that gives 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 (e.g., maize) were available for use.

At the same time, innovative and progressive farmers – even in regions with a more traditional extension strategy (i.e., technology transfer) – 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/livestock products. The problem is that extension field workers have very limited skills concerning these emerging crops and livestock enterprises, nor are they 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, then 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 knowledge 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, this means that the system itself is 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/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/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.

PASTORAL EXTENSION

Pastoral and agro-pastoral areas make up almost 65 percent of the total land of Ethiopia (EEA/EEPRI 2006) and include 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/agro-pastoral extension package; however, extension packages are now being developed and transferred to pastoral households, including water and feed resources, as well as animal health (EEA/EEPRI 2006). To date, mostly animal fattening programs have been taught to pastoralists by livestock extension DAs.

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

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 & Extension Training

System or PADETS; see EDRI, 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 (crops, livestock, and NRM). Even on the FTC DF, 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 system within specific agro-ecological 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/she has no idea that they are a “specialist” in a particular technical area; therefore, they ask for advice on a broad range of questions and are disappointed if the DA cannot help them solve their particular problem 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 get organized into producer groups and then help them get linked to specific markets for the expanding range of high-value crops/products.

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

It was also 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 to develop incentive programs for DAs, including university scholarships and regional and national DA rewards. These efforts represent a good initial step towards 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 (e.g., 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 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 these scholarships. Additional opportunities to enhance their expertise, improve their extension services to farmers, and have the opportunity to move up professionally within the extension system are non-existent in some regions and woredas.

Additionally, while official staffing policy indicates that DAs ought to be staffed in 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 it takes at least two to three years before a DA has earned the respect, relationships, and location-specific expertise to add real value to farmer communities.

Finally, DA capacity to reach adequate numbers of farmers remains a constraint. It should be noted that farmer-to-farmer training offers an additional way for DA's efforts to be leveraged and made more effective across the kebele. "Farmer professors" are discussed in detail in the box below.

FARMER PROFESSORS – FARMERS LEAD INNOVATION SCALE-UP

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, front-line extension staff used "exposure visits" as a primary experiential learning method of introducing local farm leaders (both men and women farmers) to new high-value crops or products being produced by innovative farmers in other kebeles, woredas and even regions (See Exhibit 10 in Chapter 3). The opportunity to learn about a new high-value crop or enterprise from *innovative* farmers, who are already successfully producing and marketing these different crops/products, would strongly resonate with most interested farmers. Once these local farm leaders think this new crop or enterprise has a good chance of success in their own kebele, then 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," to seek their interest, support and expertise in 1) creating local producer groups for specific high-value crops/products, 2) providing the necessary start-up technical and management support for the other farmers, and 3) arranging for the packaging and/or marketing these high-value crops/products. Once these different groups of small-scale men and women farmers got engaged in their first new enterprise, then they immediately began exploring other options that would further increase farm household income (See: Singh, et al, 2006; Swanson 2008b).

Recommendations

4.1.4) 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/entrepreneurial skills that help them run the FTCs as revenue centers and to demonstrate economic thinking to the customers. The needs for such skills were expressed by the farmers during the study, as well as others. This 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 offering. Details are provided below.

DAs need to be knowledgeable about all of the major farming systems pursued by different categories of pastoralists and farmers within their *kebele*, 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. These types of training 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 to offer 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 different producer groups will differ somewhat, in part, 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, it was reported that none of the ATVETS that the

team visited has any computers with Internet access that are available for training and/or use by students in developing their ICT skills (see section 5). However, once *woredas* have extension-linkage centers (WELC) 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 more interactive teaching-learning skills more effectively as they organize and provide extension training and demonstration activities for different groups of farmers.

4.1.5) Generalists rather than specialists.

While there has been and will continue to be debate on the topic, the recommendation from this report, based on the extensive literature review, discussion with many stakeholders, field research, and extension field experience, is that DAs should receive a more generalist training, acknowledging that a specialist approach may be necessary in specific regions or agro-ecological zones. 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 both the DAs and/or farmer groups based on specific needs and problems. As a result of this recommendation, 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 *woreda*. Given the past training towards specialists, a more generalist profile of the existing DAs can be achieved by taking in-service training classes that fill the most important knowledge gaps. This way, a FTC has three generalists, but each of them has a deeper knowledge spike in a particular area, which is a “best of both worlds” solution.

FRONTLINE EXTENSION AGENTS AS GENERALISTS

A widely debated issue across many different countries is whether front-line extension agents (i.e. DAs) should be generalists or specialists. This was an important issue in India, where the front-line extension staff only focused on staple food crops and farmers found it difficult to get technical and management information on livestock, horticultural crops, agro-forestry, fisheries and other high-value crops/products. At the time, India had parallel line departments (and extension staff) for all of these different technical areas. In the late 1990s the Ministry of Agriculture decided to field-test a “single window” delivery system whereby the front-line extension staff (most with B.Sc. degrees) became generalists that would *facilitate* the teaching-learning process across all technical areas (Swanson, 2009).

First, these front-line extension staff would help men and women farmers explore different high-value crops/products by visiting innovative farmers. Second, they would help these interested farmers get organized into different producer groups and then link these groups either to innovative farmers and/or SMS or researchers in helping these farmers develop the necessary technical and management skills needed to successfully produce and market these different high-value crops/products. Under this model, the SMS remained present at the district level to provide the necessary technical training and support; however, the front-line extension agents functioned as “farming system” generalists that facilitated different groups of farmers in diversifying into different high-value crops, livestock and other enterprises (e.g. sericulture, fisheries, etc.)

4.1.6) 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. We suggest some specific options the MOARD should consider in developing a career path.

- After two or three years of superior performance at their first FTC, junior-level DAs should have the opportunity to apply for either a senior DA position or be allowed to apply for another FTC position that is closer to the *woreda* headquarters (especially as DAs get married and have children). Once appointed as the senior DA at any FTC, they should receive a small salary increase of 50-100 birr/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 *kebele* rather than looking for other non-extension 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/month and regular DAs would have an average salary of 1,230 birr/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 B.Sc. degrees within about 10 years of service. Any DA who resigns from their extension position while working on their university degree would immediately lose their university scholarship; therefore, this condition would be a strong incentive for them to continue working hard in their field extension work while completing their university degree program.

- After completing their university degree, 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 B.Sc. 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 only be eligible for these 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:
 - Two superior performance certificates could be given each year 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 (e.g., based on specific criteria, such as number of producer groups organized; net revenue earnings from the demonstration farm, 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 certificates 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 placed on the wall of the recipient’s office at the FTC to recognize their 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 decentralized decision making and farmer participation as 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/ pastoralists and representatives from women and youth associations, next to the *kebele* head (who acts as chairman) and representative from the cooperatives.

The BPR system 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, we learned that this is the exception rather than the norm. 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/farmers have little influence on which technologies are offered, and how funds are being invested.

There is little transparency on the performance of DAs and FTCs. In fact, it was even difficult to gain reliable data on the number of DAs in service, 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 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 at each FTC appears largely based on years of service, not on their respective management skills 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

4.1.6) FTC Management Committee.

Each FTC should have a management committee, representing all clientele groups within the community, including men and women farmers/ 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 and manages the follow-up. Directly engaging these different rural groups and organizations in deciding on extension priorities will ensure that the DAs within each FTC are delivering needed extension programs and services, distributing any revenue generated by the demonstration farms 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 as the *kebele* needs to support the FTC (e.g., with land, labor, materials) and as farmers need to be open to the services offered.

4.1.7) Performance measurement and management system.

We recommend the establishment of a pragmatic performance management system at the *kebele* level. In the beginning, performance indicators are largely input based, but over time increasingly shift towards 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. Next 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/farmers in each *kebele*. The experienced SMSs and DA supervisors interviewed at the *woreda* level have not only the 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 ATVETS 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/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 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 B.Sc. 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 (e.g., 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 men and women 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 communications and information capacity.

Woredas should also facilitate networking and best practice exchange among the DAs. With few exceptions, this objective is not met by *woredas* today. There are usually neither rooms available nor meetings organized for all the DAs and SMSs within a *woreda* to meet.

Recommendations

4.2.1) 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 B.Sc. 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 a B.Sc. 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 pursue their job obligations.

4.2.2) *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 they 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. We propose to establish a monthly meeting day, during which SMSs can provide short training, and DAs can share best practices and can put important topics up for discussion. Under the IPMS project, some WELCs have been established (see photo). In order to limit the additional budget required, existing resources (rooms, ICT) should be used as much as possible.

4.2.3) Woreda advisory committee.

To improve program coordination and 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 (MC) in the *woreda*. This WAC should meet at least 4 times/year to review the progress of the extension field staff in serving the different *kebeles* and the different farmer groups (men and women 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 will 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 decentralization of the extension system, so it can be more effective in serving the needs of farmers in the different regions, *woredas*, and *kebeles* across the country. Each region now plays a greater role in setting extension priorities and in providing technical support service to the extension staff at the *woreda* and *kebele* level. As explained in more detail in the following constraints section, there are important differences between regions in how priorities are being set; however, this move towards 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 team 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 (e.g., horticulture) and livestock products (e.g., 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 scholarship for high-performing field extension workers, as well as taking the necessary action for those extension staff who are engaged in other activities (e.g., distance education) and not fulfilling their job responsibilities.

The senior-level extension directors and experts at the regional level the team interacted with 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 agro-ecological conditions. In particular, they are encouraging DAs to assist different groups of men and women 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 to 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, seeking to deliver extension services based on farmer needs and market demands. Strong efforts have been made to establish farmer input mechanisms (e.g., farmer input groups at FTC level), and the team 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 greater focus on entrepreneurialism, cash crops, and farmer group development. Little attention is being given by these extension field workers to a more balanced and expanded extension program that gives attention to the intensification and diversification of farming systems across the different *woredas/kebeles* of the region.

Linkages with players outside of extension also require strengthening. Since the 1960s, progress has been made to increase linkages and the relationship between federal, regional, and *woreda* level extension, with much progress to date. Limited collaboration exists between government extension, NGOs, universities, and research institutions, with weak linkages between extension and farmer organizations, input supply companies, and agro-processing 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 effective development of new technologies that meet farmer needs. The establishment of the Regional Research Extension and Farmer Linkage Councils (RREFLCs) has been improving matters in some regions, but more progress could be made. In particular, the RREFLCs need to foster local communities’ empowered involvement in planning, prioritization, monitoring, and evaluation of the programs and institutions that affect them.

Recommendations

4.3.1) “Walk the talk” on decentralization in all regions.

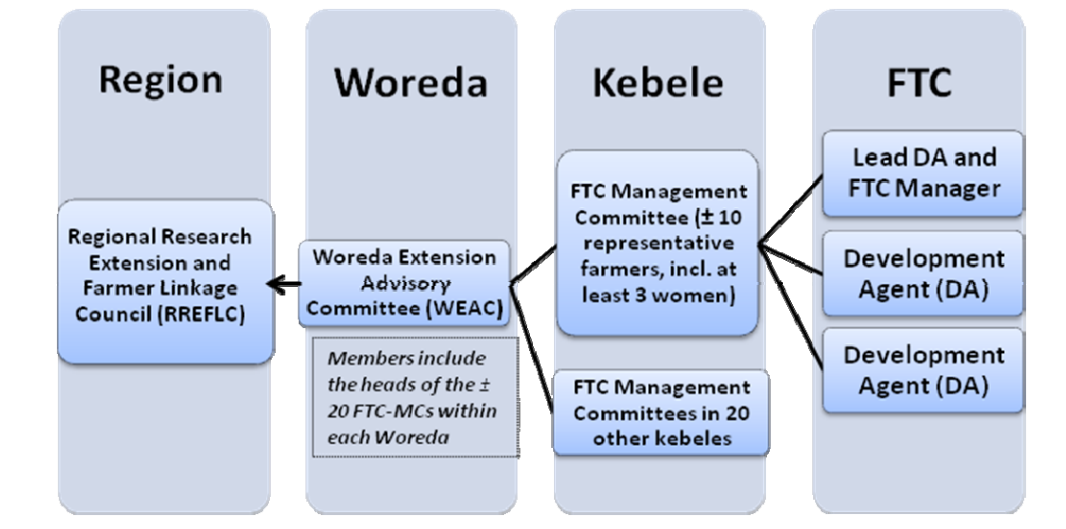
The extension system across all regions of Ethiopia should continue to transform into a truly decentralized management structure. The following key roles and responsibilities should be carried out by the different system levels:

- 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, etc. 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 agro-ecological conditions and access to markets for different crops/products.

As shown in Exhibit 9 below, if extension priorities are to be decentralized to better serve the specific needs and opportunities of farm/pastoral households at the *kebele* and *woreda* level, then these needs, opportunities, and priorities for all major categories of farmers must be agreed to – first at the *kebele* level (e.g., through the FTC MC), and then this FTC plan should be reviewed, coordinated, and supported by the *woreda* Extension Advisory Committee (WEAC).

EXHIBIT 9. Suggested farmer-driven extension management structure



At the national, regional, and zonal levels, senior extension officers will need to continue monitoring extension activities and impacts, as well as in 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*.

4.3.2) Explore opportunities to strengthen linkages with NGOs in the extension environment.

Opportunities exist for bringing NGO and private-sector expertise to implementation of extension exercises, and encouraging knowledge sharing and collaboration between these groups that are already active in the field (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 (e.g., nutrition efforts), for example, could reap synergies and ultimately serve the Ethiopian public more effectively.

5. Agricultural Technical and Vocational Education and Training (ATVET)

BACKGROUND

The Ethiopian government has responded to the growing farmer demand for extension services to improve productivity by establishing Agricultural Technical and Vocational Education Training (ATVET). 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 to address some of the major constraints faced by the National Extension Intensification Program (NEIP). The NEIP drove short-term gains in increased agricultural GDP in the 1990s, primarily through delivery of massive production inputs including improved seeds, fertilizers and credit (GOE 2005). This supply-driven program faced several limitations, including marginalization of farmers outside of 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, they were reduced to 25.

ATVETs seek to produce middle-level, skilled, and competent agricultural DAs who will then teach farmers at FTCs. The ATVET colleges provide a 3-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.

- **Animal Health Department.** The department offers basic courses on animal anatomy and physiology; infectious and non-infectious diseases; and drugs and their administration.
- **Animal Science Department.** The department offers courses on 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.
- **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.
- **Natural Resource Department.** The department provides basic courses on the development and sustainable use of natural resources (forests, soil, non-timber forest products, alternative energy sources, etc.) and water harvesting technologies. Practical skills are developed by providing tree nursery farms; agro-forestation/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 developments, external and internal structures, growing media and their constituents, production technologies and their management, major pests and their controlling methods, post-harvest handling, and processing techniques. Focus is put on 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 crops farms, fruit crop production, horticultural crops farms, research plots, and farm equipment and facilities.
- **Basic and Supportive Courses Department.** This department offers basic and supportive courses. The courses include basic science courses such as Computer Application; English and 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) for accreditation for all diploma programs in the country, including the ATVET program.

Institutional coordination of ATVETS

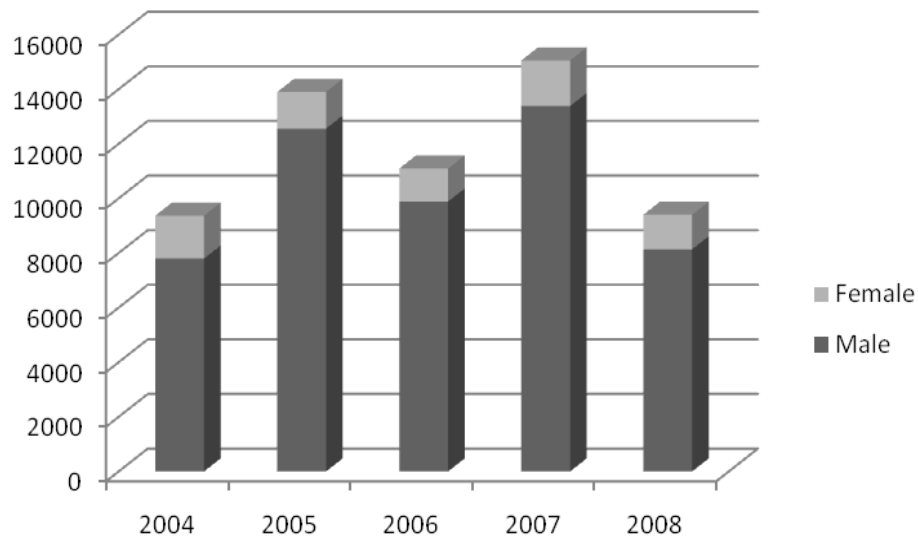
There are two classes of ATVET colleges: federal and regional colleges. There are seven federal colleges (four from large regions and three from emerging regions) that report to and are managed by the MOARD. The rest of the colleges (“regional colleges”) are managed by the BOARDS or the MOE through the 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 Administrative and Development); Heads of the academic and research units; two representatives of the teachers; Heads of the Registrar and documentation office; 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 started graduating DAs in 2004. Exhibit 10 shows that over 8,000 DAs have been qualifying and graduating every year. For most ATVET colleges, over 1,000 students have graduated since the establishment of the training program. By 2008 the colleges had produced roughly 63,000 DAs (12 percent of them women).

EXHIBIT 10. Female and male ATVET college graduates, 2004-08



Source: ATVET head, 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 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 cover include:

- Research activities in the areas of crop science, animal science, and NRM. Some colleges have started research works in collaboration with the Science and Technology Commission. The research undertaken includes sericulture, water harvesting, irrigation, and cropping systems.
- Providing direct extension services, sometimes with NGOs, to farmers through FTCs for both small and large private farms. The ATVETs work closely with farmers to provide technical information in crop production, livestock production and natural resource management. NGOs like FAO, Farm Africa, 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.

- Providing short-term training: for DAs and Para-veterinary technicians. Some ATVETs arrange for short-term and in-service training for the field-level extension agents. This provides an opportunity for the 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, which provide a sound base upon which to build:

- **Physical ATVET network.** In six to seven years, Ethiopia has rapidly established 25 ATVETS, which have together produced roughly 63,000 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 have adequately furnished classrooms, and most have basic library and laboratory facilities.
- **Broad ATVET service offering.** As well as 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 beef and small ruminants.
- **Qualified instructors.** The ATVETs are increasingly being staffed by well-qualified instructors. Exhibit 11 lays out a sample of 5 ATVETS' instructor details over time. Most teaching personnel in these ATVETS are B.Sc. holders, and this number has on the whole been increasing since 2001/02 (Ethiopia calendar year 1994). The number of women B.Sc. instructors is also increasing slightly, though the number still remains small on a relative basis. The number of M.Sc. holders has also been increasing gradually.

EXHIBIT 11. Categories of teaching staff in five ATVETs in Gewane (Afar), Chiro (Oromia), Wukro (Tigray), Dilla (SNNPR), and Bure (Amhara)

Major Categories of Teaching Staff	2-3 yr Ag Diploma from college/University			B.Sc. degree			M.S.c degree			Ph.D. degree				
	Year	EC (GC)	M	F	T	M	F	T	M	F	T	M	F	T
	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

EC - Ethiopian Calendar GC – General Calendar

- **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.** Creating 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 which 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.

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

ADAPTATION AND DISSEMINATION OF MUSHROOM

About mushrooms in Assosa: Mushroom is a delicacy eaten by many people in the region and the market demand for it is high. It is usually collected from the forest and farmlands during the rainy season.

Assosa ATVET mushroom program: Assosa ATVET has started an innovative mushroom enterprise for training purposes as well as disseminating the technology to farmers and rural communities

- **Domestication:** The college first tried to domesticate the local varieties known in the local language (Berta) as Abralu and Affifi. The performance was quite encouraging and motivated a search for ways of increasing its production. This has extended to exotic varieties, *P. florida* and *P. sajor-caju*, which have done very well on natural straw, teff straw, 'Geraba of chat' as well as bamboo leaves. The yield by these exotic varieties has been very encouraging, achieving 1-1.5kg/bag within a time frame of 20-24 days compared to 400gm/bag within three months for the local varieties. Harvesting can also be done 4-6 times from the same media making it very attractive to farmers.
- **Food and Medicinal benefits:** The mushroom has great food and medicinal benefits. The mushroom contains proteins, vitamins (thiamine-B1, riboflavin-B2, niacin and biotin), minerals (potassium 45%, iron, phosphorus, sodium, magnesium and calcium) and does not contain cholesterol. These and other enzymatic contents of the mushroom make it a highly medicinal product.
- **Technology:** The mushroom technology is simple to apply. It requires chopping of the straw, boiling it for half an hour and watering it for five days. The raw materials required are all agricultural wastes which are easily available. The process requires just about 23 days for the mushroom to be ready for harvesting. It is an appropriate technology that is environmentally friendly, less costly and compatible with the farmers' farming systems. It is an innovation that can be up scaled among many farmers and efforts made to tap into both rural and urban markets.
- **Training:** 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 farmer training centers (FTCs) from 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 the mushroom. Following the workshop, there has been increased demand for further training on the mushroom. Three NGOs have invited the instructor to train organized women 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 Kubrehamsha camp, one for the refugee camp and one for the local farmers.
- **Dissemination:** The college has prepared a training manual in Amharic entitled 'Enguday besaynsawi menetser' which contains practical guidelines on mushroom production and handling of the mushroom 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 neighboring the College and the demand for the seed is increasing.

Source: Authors

CONSTRAINTS OF AND RECOMMENDATIONS FOR ATVET

In this section we outline some of the important constraints in the ATVET system and the recommendations that will increase its effectiveness at training DAs into farmer-centric, market-driven, and entrepreneurial support for the nation's farmers:

Constraint: Insufficient and/or poorly prioritized financial resources

The major sources of ATVET funding are the MOARD, BOARD, RCBP, and, to a very limited extent, the colleges themselves. We heard in our 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, while 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 5.1.1) Revamp the ATVET system

Enhance the sustainability of the ATVET system 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 roughly 63,000 DAs for service. Going forward, the mandate of the ATVET system will change due to the decreased need for additional DAs and the increasing need for higher skill levels to serve farmers. Different 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 (Kreuchaf, 2008). One option is to use colleges to top up DA numbers following attrition (8 percent, or around

4,800 new DAs) 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 (e.g., Ministry of Education), converted into regional TVETs, or transformed into private institutes.

Another option would be that the 25 colleges 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 (one to two in each region). The other colleges (15-16) would then be transformed to ATVET institutes for delivery of massive lower-level programs; nonformal, short-term training; and business services.

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

Recommendation 5.1.2) Equipping ATVET colleges for success

Strategically equip active ATVET colleges with needed facilities and equipment to improve training. These investments may include investment in Internet access (ICT), 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, veterinary clinic/laboratory, agronomy and soil laboratory, soil and water engineering units, and a greenhouse. Farm demonstration equipment, machinery, and implements will also be required.

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

Constraint: 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 ratio of 30:70, theory to practice, most officials we interviewed (at BOARD, College administrators, etc.) indicated that the style of training is predominantly theory-based and with limited practical due to 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 market demands.** As Ethiopia's agricultural system evolves, the extension system will also need to evolve to a more market-oriented system that is geared towards helping farmers adapt to rapidly changing markets. This requires a curriculum that is more market-driven, supportive of diversified crops, entrepreneurial, and farmer-centered, and one that supports cooperative management. The current curriculum contains few, if any, issues more typically championed by women, such as household nutrition, sanitation, and hygiene areas.
- **Too much specialization too early.** Currently the training is structured to produce specialists. In the old system before the ATVETs were established, the trained frontline extension agents were generalists who were expected to serve the farmers on all issues raised. Our assessment has raised the question of whether DAs should specialize or be generalists, with more attention to farm management and marketing.
- **Low attention to diversified farming systems.** Agriculture in Ethiopia is characterized by mixed farming system of crop and livestock production. The livestock subsector is depended upon by majority of smallholder farms for power, cultivation, and transport of goods; it also makes 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 (Belay and Abebaw, 2004). Within the 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 for effectively working with farmers in diversified farming systems.

Recommendation 5.2.1) Overhaul ATVET curriculum for farmer needs

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 5.2.2)

Enhance instructor capabilities by providing in-service and short-term training to develop instructors' practical training skills, basic entrepreneurial skills, college leadership, 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: Incomplete and untimely 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 apprentice program is also held during off-season in October and ends in June when farmers are beginning to engage in main farming activities.

Recommendation 5.3.1) Improve apprenticeship program

Improve apprenticeship program to provide apprentices with strong practical-based experience. The students need to get 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 student should be assigned to work closely with strong DAs and SMSs when they actually carry out specific training activities, so they can assist and learn from these extension activities. This should be scheduled when farmers are doing 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: 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. For most ATVETS the FTCs are not linked to the colleges to provide opportunities to DAs to improve on their practical applications. They also do not have effective linkages with research centers and universities. These poor linkages mean the ATVETs do not receive the feedback to help them to adjust and deliver services most up-to-date and relevant to the extension system.

Recommendation 5.4.1) Strengthen ATVET linkages

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 skill training for DAs and SMSs; SMSs being invited as guest speakers at Colleges; Colleges supporting *woredas* in preparing extension materials; ATVETs linked with research centers and Research Extension Farmer Linkage Councils; 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 (e.g., rural technology centers and agro-processing firms), to support strengthening of innovation and entrepreneurship in the ATVET network. Some ATVETS, including Chiro ATVET 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. The enabling environment

The country-wide enabling environment in which extension operates is critical to extension efforts 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 within this report 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 agro-economy'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 economy-wide 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 one percent of farmers used improved seed for teff, barley, and sorghum (Spielman et al. 2009).

This large disparity between seed supplied and demanded is driven largely by supply-side market failures (Spielman et al. 2009). In every region that the team visited, the problem of obtaining improved seed was mentioned by different 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. While private companies (e.g., Pioneer) exist, they play a very small role in producing and distributing seed in Ethiopia.

Commentators point to a variety of issues 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 into investment 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 et al. 2009).

Fertilizer and other inputs

Ethiopia ranks amongst the countries in Africa with the highest depletion of soil nutrients (more than 60 kg/ha). As a land-locked 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 the seed system, particularly as they relate to distribution. The GOE attempted to liberalize its fertilizer distribution in the late 1990s (Spielman et al. 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 to most smallholder farmers, yet productivity gains depend on this access. Smallholder access to fertilizer will be critical to solve if Ethiopia is to see continuing increases in productivity; with staple crop yields being most severely limited by soil degradation.

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 m³ of water storage per capita compared to ~750 m³ for South Africa and 4,500 m³ 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 32 percent for Madagascar.

Rainfall patterns in the Greater Horn of Africa are exceptionally variable in timing and across years, and when combined with low storage, such variability truly leaves Ethiopia "hostage to hydrology" (Grey and Sadoff, World Bank, 2006). This variability has a twofold effect: direct productivity impacts of

hydropower-dependent industries and irrigators, when water needs are not met in critical parts of the season; and reduced adoption of improved inputs (e.g., 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. This was confirmed in a recent International Water Management Institute (IWMI) study that observed a positive impact of irrigation investments on poverty. These impacts were observed anecdotally by the team in the field. In Afar Region, the team observed pastoralists transforming into agro-pastoralists 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.

However, the IWMI report also pointed out that past investment in irrigation largely had a negative return on investment. With limited financial resources, there is little room for error in allocating investment capital. There is currently no mechanism for prioritizing and optimizing investments in water and agriculture to have the most economic benefit.

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 micro-finance institutions (MFIs). Farmers' access to agri-credit (and financial services more broadly), however, remains inadequate: of the estimated 6 million potential micro-finance clients in Ethiopia, just over 1 million are currently served. There is also very significant regional variability in the availability of finance institutes, and some regions (e.g., Afar, Somali) have hardly any access at all. Additionally, cultural constraints in certain regions also prevent farmers from using micro-credit.

There are several reasons offered for this, including remnant challenges in the legal and regulatory operating environment, which still requires all micro-lending organizations to be supervised by the National Bank of Ethiopia, and to be 100 percent owned by Ethiopian nationals; that minimum deposit rates of 3 percent must be obtained; and that private MFIs must all 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, crowding out all but the most (and reportedly very substantially more) efficient private MFI enterprises (Druschel, 2005). 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 relation to timing, length, and amounts). Credit access varies considerably by region, hampered in part by distribution costs (in remote and inaccessible regions) and 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 greater available of financing for agriculture, as *woreda* governments and DAs could utilize micro-financing to strengthen FTC resources and stimulate revenue-generation at the FTC level. Micro-financing 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 perpetuate 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 inputs 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, there are very few traditional farmer groups that exist at the local level. Cooperatives are the usual mode of forming groups around agricultural production. However, due to negative experiences through 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 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 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/transaction costs are particularly limiting. Remote regions of Ethiopia (e.g., 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 their location and distance from major demand centers, cropping systems are limited as well, and tend to focus on staple crops, with little emphasis in 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 for this project identified post-harvest management and post-harvest 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 provide greater productivity and prices for agricultural products. Investments by NGOs in coffee post-harvest management, for instance, have led to increased prices and increased access to international markets for Ethiopian smallholders; these types of practices could have similar impact on other commodities and cash crops.

ECONOMY-WIDE ENABLERS

In the broader context of the Ethiopian economy, economy-wide 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, impacting how smallholders compete and interact within the market. Ethiopian agricultural policy will need to continue to focus on the smallholder and his success if the goals of extension are to be realized. Future investments in system-wide 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 economy-wide enablers.

From a system-wide 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 issues.

2) *Market orientation*- The official government policy of Ethiopia has a “commercialization of agriculture” focus (see Gebre-ab 2006), yet some activities of the GOE limit the market orientation of the current agriculture system. The government, pursuing nationwide food security initiatives, tends to crowd out private sector players (see Spielman et al. 2008). Most agricultural processes are dependent upon state intervention (e.g. fertilizer, credit). Furthermore, the private sector is underdeveloped in its capacity to participate. As the Ethiopian economy continues to grow, there will be increasing market opportunities for different type of high-value crop, livestock and other products (e.g. honey, mushrooms, etc.) 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 (e.g. flowers, honey, etc.), especially where Ethiopia has a comparative advantage. Trade policy should support this move and help Ethiopian farmers to start producing for these emerging international markets. The GOE's submission of a Memorandum of Foreign Trade Regime (MFTR) for the World Trade Organization, which opens the long journey to WTO accession, suggests an increasing openness to trade that would increase competitiveness of Ethiopian agricultural products. In addition, current anecdotal evidence suggests that existing rules could be strengthened- for instance, farmers reported that the export process for 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

While 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 and the Food Security Program. Both of these programs are seeking to analyze constraints within the country-wide enabling environment systems 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 demonstration and technology transfer.

The GOE must also play a critical role in strengthening these systems. Working with donor organizations on economy-wide projects, government will play a critical role in ensuring that desired outcomes are achievable and that the system

responds to new demands in the enabling environment. Government has a particular role to play in economic and trade policy, particularly 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 line, with an aim towards 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, it also raises issues of long-term sustainability. If the existing field extension system continues to grow from the current 8,500 FTCs to the envisaged 15,000 FTCs, staffed at similar levels (3 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 chapters on the field extension system, ATVETs and training, and institutional coordination also imply new investments in both physical and human resources. Taken together, the current extension system and the recommendations outlined in this report have serious resource implications in the longer term.

The trajectory raises two questions addressed in this chapter:

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

Sustainability has two dimensions. On the 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 chapter 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 illustrated 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 micro-credit organization, he 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

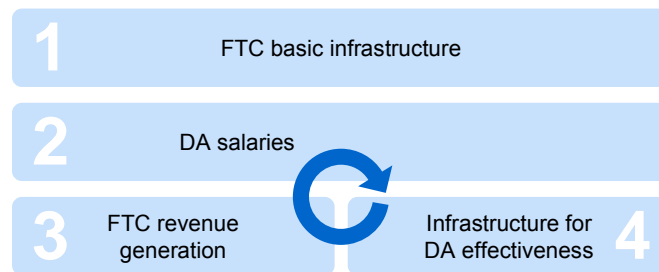
purchase a cow, and began to diversify his horticulture production into new crops. The revenue from dairy and horticulture created a surplus to reinvest in the FTC, leading to more entrepreneurial demonstrations and more sophisticated water-harvesting. By 2009, the FTC had built four housing units, purchased a bicycle for transport, and begun diversifying their 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, the FTC is both sustainable and having high impact on farm household income. 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 looks at sustainability practices in two parts. Part I looks at 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 GOE to maintain this level of investment. A set of key principles is needed for GOE at the federal, regional, and *woreda*-level to understand the factors and make these investment decisions. Exhibit 12 illustrates the cost structure of an FTC .

EXHIBIT 12. Cost structure for FTCs



All FTCs require the basic infrastructure described in Box 1. These fixed costs for construction typically cover the building itself and 1.0 to 2.5 ha 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. Box 2 describes the recurring costs of DA salaries. These are funded by federal budget decentralized to the *woreda*-administration. The potential for FTCs to generate revenue is described in Box 3. Similar to the Atsibi FTC, this includes market opportunities from crop and livestock demonstrations to reinvest in the FTC; options also include revenue from input supply, fee-for-service activity, and linkages to output markets. Finally, Box 4 describes the infrastructure for DA effectiveness, which includes all resource costs (beyond the basic infrastructure) that enhance a DA's ability for farm-level impact and revenue generation (e.g., 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.

Trade-offs in FTC staffing from 3 to 2 DAs can enhance sustainability

The current plan staffs each FTC with three DAs, with each DA specialized in either livestock, crop production, or NRM (Box 2). Lessons from the T&V model from the mid-1970s to the mid-1990s, and regional extension examples 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 2 per FTC, thus freeing up cost savings that can be used for operational purposes.

These cost savings can then be reinvested in infrastructure for DA effectiveness (Box 4). Interviews, focus groups, and workshops with DAs highlighted a common thread: 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 to meet farmer needs. After transport, DAs coincided 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 four of this report, 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 leverage of the extension system without incurring the additional cost of increased 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, dependent on major cropping system of the given woreda. It is important that individuals selected be employing accepted best practices and are 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 ensures that the best farmers participate in the program. Once implemented, the program will become a complementary component to DAs’ efforts, strengthening extension outreach and bringing real world experiences from the best farmers in the kebele.

FTCs can also generate revenue to improve farm level impact and sustainability (Box 3). 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, not only modeling the DA’s on-farm practice, but also their 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 authority to determine how the revenues from the demonstration farms are spent, and to ensure that the DAs do not allow the revenue motive to detract from 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.

Enabling systems are critical in order to capitalize on these investment choices and trade-offs

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 to 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 funds backstopped 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 report describe need for DA in-service training, and recommends that DA training shift from specialized areas of crops, livestock, and NRM to more generalist training with 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 more immediately, through in-service training offered to existing DAs. Short trainings to hone these skills can happen in two ways: through ATVETs and SMSs at the *woreda* and regional-level, 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 market-orientated aspects of the 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 in high-value crops, create opportunities. However, output markets are typically the domain of producer groups and cooperatives, particularly in post-production, where public extension will likely take a more facilitative role.

Woreda governments need the tools to decide between FTC alternatives and trade-offs

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 backstop 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, 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 make entrepreneurial investments, it's important that decision-making remains bottom-up, with FTCs developing an investment plan based up on a set budget and woredas holding FTCs accountable to anticipated results.

- **Analyze and determine appropriate numbers of FTCs.** GOE faces a number of considerations in the expansion of the system itself from 8,500 to 15,000 FTCs in coming years. A decision-making framework, driven by strong evidence, would enable 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.

CONSIDERATIONS FOR LONGER-TERM SYSTEM SUSTAINABILITY

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 analyze issues of coverage versus quality, the role of the enabling environment, the ability for 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 GOE should consider at their disposal.

REVENUE AND CREDIT IN THE CHINESE EXPERIENCE

In China, for instance, the public extension system began to experiment with alternative models of provision in the 1990s both to generate revenue for the public sector and to leverage a wide range of providers. The public sector maintains control of extension services but allows for a plurality of actors in defined areas, particularly in high-value specialized farming, and for revenue generation. The shifts have led to a more sustainable model that primarily drives revenues through public-sector input suppliers to farmers with readily accessible credit. The right mix of revenue and credit, paired with tools like input subsidies, were drivers for China's transformation.

- **Revenue generation:** Commercialized agricultural services were introduced in China to work in tandem with basic extension services in rural areas to facilitate input supply to farmers, combined with one-on-one advisory services to each farmer about the appropriate technologies for their specific farms. Sales on all inputs generated a 2% profit, which, in turn, covered some staffing and operational costs for the field extension system. The input supply, namely seeds, fertilizers, and pesticides are state owned enterprises. In addition to commercializing public input suppliers, the Chinese system also issues tenders for technical contracts on high-value farming to alternative providers, but aligns with public priorities.
- **Credit supply:** Two key drivers for the expansion of small farmer production and cultivated land in China were government subsidies available for farm inputs and credit offerings from rural credit cooperatives. Cooperatives partner with public extension agents, particularly the commercialized agricultural services, to facilitate credit lines to farmers. The Chinese combined an input driven push of improved seed, fertilizers, and pesticides to small producers with access to credit. The credit supply also enabled the expansion of irrigated land with micro-irrigation technologies and mid-scale investment, in parallel with a government strategy of large-scale water investment.

Agricultural extension adapts to external factors

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 unveils 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 now create 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 agro-ecologies.

The availability of agricultural inputs has also been a historic driver for systems change in extension. Affordable micro-irrigation technologies and mid-scale irrigation investment multiply productivity. The provision of fertilizer and improved seed through non-state 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?

Issues and options in the future

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 distinctive in comparison to 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 non-public 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.

Revenues within the system

China’s case 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, 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 FTC’s 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: DA fee-for-service in high-value crops and livestock enterprises, or a fee-for-service model in post-production 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 service. Particularly when the public sector has a profit motive, incentives can be considered for DAs to deliver quality services.

New actors and PPPs in post-production, high-value crops, credit, and inputs

The field extension system is already interacting with NGOs and the private sector for 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 micro-irrigation 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 to buyers. Universities, research institutions, and producer groups also play a role.

Post-production and high-value crops are areas where public systems historically draw on expertise from non-public providers. The role of the private sector and NGOs is emerging in both post-production and high-value crops, driven by profit motives and the potential for livelihood gains for small farmers. With a careful strategy, GOE could harness the role of these non-public providers in specific areas. The Chinese model shows how competitive bids and tenders for these services can hold non-public providers aligned with and accountable to the public system. Public-private partnerships (PPPs) are also a technique to infuse new capital in productive areas. Recent investment in Ethiopia's livestock industry is an apt example where enhanced scale is possible in post-production. 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 backstop risk for cooperatives and *woreda*-level resources. Given the high-impact potential for widespread and

consistent supplies of credit, there is potential 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 (e.g., coffee). This should be viewed as a positive development for the system. However, public extension will always be crucial for farmers.

Changes in the enabling environment

As discussed at length in section 6, the enabling environment is a vital component of 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. Particularly with input supplies, 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.

CLOSING THOUGHTS ON SUSTAINABILITY

Considerations on sustainability and trade-offs remain central to the findings in this report. The current growth of the system, while impressive in both scope and impact, requires more reflection for a “best fit” solution for extension vis-à-vis other enabling systems. In the near term, the scenario presented in Part I of this chapter 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 demonstrated an entirely new model for demonstration and knowledge transfer.

Part II of this chapter emphasizes that GOE and the public extension system have three important levers at their disposal for impact and sustainability: revenue generation, non-public 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 for public extension to drive agricultural transformation.

8. Recommendations and implementation

RECOMMENDATIONS

This report has described recommendations and potential change actions across each level of analysis, illustrating 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 impacting an important aspect of the extension system:

1) Strengthening farmer-driven orientation across all levels of extension, focusing on farmer needs at woreda and kebele level

The overall management and orientation of the extension system must be driven by farmer needs, from the types of services offered at the FTC to the overall strategic direction set by regional and federal policy makers. 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. While a policy of decentralization has been followed by the MOARD, the implementation has not yet been consistent across all regions and more could be done to increase the voice of the farmer in the system.

2) Broadening of extension services offered

This report has described in depth the great variation in services required by the farmers, pastoralists, agro-pastoralists, women, and youth of Ethiopia. Extension will need to broaden services to meet the subject-area needs for 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 will need to be strengthened in order to have farmer impact – both capital resources such as adequate buildings and demonstration plots as well as the operating capacity of the FTC to provide farmer demonstrations. Recommendations include an increased focus on sustainability activities (e.g., increasing introduction of revenue-generating

demonstrations and potential for financially sound loans and micro-loans for operational activities) at the FTC level.

4) Improving DA knowledge 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 (e.g., farmer professors) should also be leveraged to support and strengthen DA outreach and trainings.

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 (e.g., messaging and support from *woreda* and MOARD that focus on important nature of DA services, development of a clear DA career path) strengthen the overall implementation of extension services at farmer level.

6) Implementing performance culture and transparency at all levels of extension

Several recommendations identified as critical to increasing farmer impact (e.g., identifying metrics to track impact at 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 report recognizes the importance of a system-wide approach to extension. Recommendations focused on linkages between extension actors (e.g., strengthening ties between DA and SMS through WREC) 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 non-extension actors (NGOs, private sector entities) that impact how farmers are served through the system.

Detailed actions that fall under each theme are illustrated below.

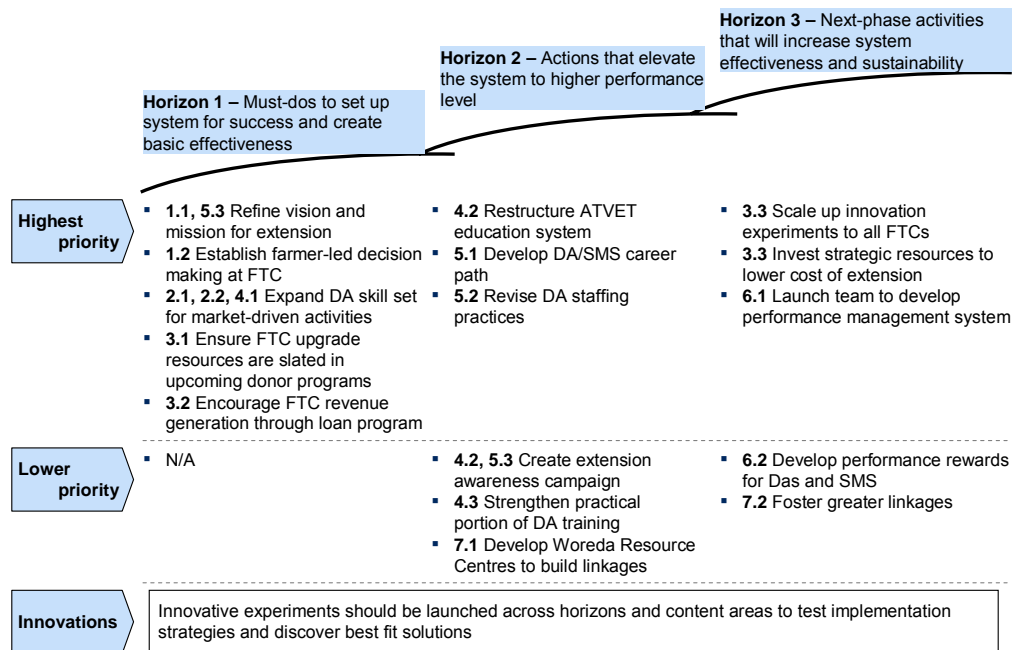
EXHIBIT 13. The recommendations are represented by 7 themes

	Themes	Activities
1	Strengthening farmer-driven orientation across all levels of extension	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 3.1- Resource FTCs to basic functioning level ▪ 3.2- Utilize credit to strengthen operations at FTC ▪ 3.3- Strategically invest in add-on resources, innovations
4	Strengthening DA knowledge and capabilities	<ul style="list-style-type: none"> ▪ 4.1- Offer in-service training for DA skill building ▪ 4.2- Re-structure and strengthen ATVET system, curriculum ▪ 4.3- Revise/ strengthen DA apprenticeship/ practical program
5	Improving DA motivation and retention	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ 6.1- Launch performance mgmt 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 the extension system	<ul style="list-style-type: none"> ▪ 7.1- Develop Woreda Resource Centers to provide adequate linkage and information opportunities for DAs and SMS ▪ 7.2- Foster improved linkages between research, ATVETs, on-the-ground extension through site visits, farmer meetings, etc

IMPLEMENTATION ROADMAP FOR ETHIOPIAN EXTENSION TRANSFORMATION

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

EXHIBIT 14. The recommendations have been prioritized across three implementation horizons



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 partnership focus with donor organizations that are active in agriculture. Two programs in particular, the World Bank’s AGP and the Food Security Program, 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:

- **Refine clear vision and mission for Ethiopian extension.**
We 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 impact awareness of all seven recommendation themes, and should be led primarily by the Federal government with support from MOARD. This activity is relatively low-resource.

- **Strengthen farmer-led decision-making at FTC level.**

We recommend that the MOARD take the immediate step to establish and/or strengthen farmer committees at the FTC level, involving broad set of farmer stakeholders (including women, pastoralists, etc.) in the general operating decisions of the FTC. This important first step will help drive the shift towards a farmer-driven extension policy. This activity will have direct impact on recommendation theme 1, and should be led primarily by the MOARD. This activity will be relatively low-resource dependent mainly on initial direction by the MOARD and implementation and support from *woredas* and *kebeles*.

- **Start to expand DA skill set for broadening extension offering.**

We recommend that the MOARD launch a set of in-service trainings for DAs, SMS, 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 decision making at the FTC level is met by impactful trainings and demonstrations. This activity will impact recommendation themes 2, 4, and 5, and should be led primarily by MOARD. Regions, *woredas*, and *kebeles* will be critical implementation partners as the program gets up and running. This activity will have 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 operational level.**

We recommend that the MOARD, in conjunction with multiple donor programs including the upcoming AGP and HABP, ensure basic resourcing

investments to bring FTCs to 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 impactful trainings, demonstration plots, etc. This activity will impact recommendation themes 3 and 5, and should be led primarily by MOARD, with significant resource commitments and activity from the donor and NGO community.

- **Encourage FTC revenue generation and financing for operational activities.**

We 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 to broaden 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 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 get the full impact of extension. Activities include the following.

Highest priority

- **Launch a project to experiment in selected FTCs and generate success cases.**

We recommend that the extension system experiment with new approaches and technologies in 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 likely demand a moderate level of resources.

- **Implement revised DA hiring and staffing practices focused on home *woreda*.**

We recommend that the extension system begin staffing DAs in home *woredas* and home regions and end the process of shifting DAs to different areas after limited periods of time in field (under one year). Altering these practices will have great impact both on extension efficacy (e.g., 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.

- **Review and enhance DA and SMS career paths.**

We recommend that MOARD develop and implement DA and SMS career paths, increasing role clarity and motivation of extension personnel as well as providing suitable framework for performance management techniques. These activities will impact recommendation themes 4, 5, and 6 and should be led by the MOARD. Limited resources will be required.

Lower priority

- **Restructure extension agent education system.**

We 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 report, these activities include restructuring the curriculum and practical components and shifting emphasis to a broader set of extension topics (e.g., horticulture). This team will likely be jointly sponsored by MOARD and the ATVETs, and will directly impact 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 point between DAs and SMS.**

We recommend *woredas* develop *woreda* Resource Centers, offering a place for DAs to come to obtain information from SMS, and host trainings. These

centers would support greater service to farmers, as DAs would have greater opportunity to connect with SMSs, research, and the broader extension community. Depending on approach, costs could be limited, as *woredas* leverage buildings and infrastructure already in place at *woreda*. Some moderate investments in technology and training materials would be required.

- **Strengthen the practical portion of DA training in the field.**

We recommend that ATVETs and *woredas* work together to strengthen the practical internships undertaken by DAs in the final 9 months of their training. Currently, most internships are ad hoc and poorly managed, with little supervision. Adding structure and clarity around DA intern role and requiring time spent on the farm site in productive activity (shadowing either DAs or model farmers) would have positive impact on DA preparation and would also help develop greater soft skills the DA could bring into his new role. Led in partnership between ATVETs and *woredas*, this activity would be relatively low cost.

- **Create an awareness campaign for extension program.**

We recommend that MOARD launch a marketing campaign designed to increase awareness and prestige of DA program, helping to increase DA motivation and retention as well as farmer participation. Overall messaging should be relevant to extension system as a whole, with 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 system

Horizon 3 activities 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.**

We 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; 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 potential be quite resource-intensive and may be an opportunity to leverage donor relationships for capital investments.

- **Develop performance measurement and evaluation scheme.**

We recommend that MOARD develop a system-wide 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, SMS, etc. 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 MOARD. Limited resources will be required.

- **Invest in strategic set of resources to lower cost and increase extension efficacy.**

We 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 range of impact DAs can have (and potentially scaling back to one to two DAs per FTC in this region due to distance between farm, etc.). These resources should be carefully considered from a cost-benefit perspective, and should be region/*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.**

We recommend that 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 performance.**

We recommend developing a set of system-wide performance incentives to

encourage high performance from DAs, SMS, 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, etc. could potentially be linked to 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. While many of the recommendations and activities described above require appropriate timing and partnership to be implemented, there is a set of actions that the Ministry of Agriculture can take on, of its own volition, to prepare for success as more extensive pieces of this extension transformation are put into place. For reference we have prepared a checklist of important enabling actions that should be implemented as soon as possible by the MOARD. These actions are low-cost, high-impact ways for the extension system transformation to gain traction and will illustrate to the broader community that the MOARD is serious and committed to action on extension efficacy.

EXHIBIT 15. MOARD near-term extension activities checklist

- Prepare FTC investment guide, including key resources needed for baseline level, in preparation for donor conversations
 - Complete country-wide FTC assessment, determining current level of infrastructure at all built FTCs (simple survey to *woreda* heads on infrastructure in place, or more extensive study)
 - Adjust regional policy of DA placement, shifting to staffing in home *woredas* and ending practice of shifting DAs to new *woredas* after 9-12 months
 - Direct *woredas* to implement peer learning programs amongst DAs, including feedback mechanisms and common meetings (potentially meeting quarterly at *woreda* office); potential for programs to be SMS-led and include half-day training on specific subjects by SMS
 - Issue communiquéé to *woredas* on DA training/apprenticeship, shifting to farm-based, supervised internship models for new DAs (e.g., mandating time with model farmers, time shadowing DAs, some supervision)
 - Brief regional extension leaders on farmer-driven approaches, enabling regions and *woredas* to implement proposed decentralized environment and giving flexibility to DAs and SMS to meet farmer needs and requests
 - Identify gaps in extension packages for women, pastoralists, agro-pastoralists, and direct research and relevant extension partners to begin development of relevant new materials for these groups
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CLOSING THOUGHTS ON EXTENSION RECOMMENDATIONS

Drawing on the full range of report findings and strengthened by extensive stakeholder engagement, this set of recommendations and implementation plan can be viewed as a road map for strengthening and improving the Ethiopian extension system. To be successful, a range of actors including the GOE, the MOA, 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 policy makers.

The review 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. We are therefore excited about the potential impact that further strengthening the extension system will have on the men and women farmers across Ethiopia; impact that both helps to maintain national food security while at the same time increases farm income to improve rural livelihoods.

¹ Ministry of Agriculture and Rural Development, personal communication with State Minister, 2009.

² Ministry of Agriculture and Rural Development, personal communication with State Minister, 2009.

³ IRIN Humanitarian News and Analysis, UN Office for the Coordination of Humanitarian Affairs, <http://www.irinnews.org/Report.aspx?ReportId=80908>, 14 October 2008.

⁴ IRIN Humanitarian News and Analysis, UN Office for the Coordination of Humanitarian Affairs, <http://www.irinnews.org/Report.aspx?ReportId=85021>, 26 June, 2009.

⁵ Source: Authors.

⁶ For example, in one district (*woreda*) in India, in just 3+ years, a market-driven extension system introduced over 30 different high-value crops, livestock and other enterprises that resulted in over 750 producer groups being organized and linked to markets. For more information on creating a more market-driven extension system, see Singh, et al, 2006, Swanson, 2006, and Swanson 2007.

Appendix

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APPENDIX A. LOCATIONS, PARTICIPANTS, AND DATES FOR DATA COLLECTION

Location	Organization or individuals	Dates	Details
Addis Ababa – Pre-test	MOARD	24 April	
	Agri-Service Ethiopia	24 April	
	Ethiopian Institute for Agricultural Research (EIAR)	24 April	
Oromiya Region – Pre-test	Oromiya Bureau of Agriculture and Rural Development (BOARD)	24 April	
	Holetta Agricultural Technical and Vocational Education and Training (ATVET)	24 April	
	Wolmera Woreda OOARD	24 April	
Addis Ababa	Panel of experts	2 May	
	Sasakawa-Global 2000	3 May	
	MOARD	4 May	Extension management, planning
	Rural Capacity Building Project (RCBP)	4 May	
	Save-UK	4 May	
	Prolinnova	4 May	
	World Vision	4	

Location	Organization or individuals	Dates	Details
		May	
	SOS-Sahel	4 May	
	ACDI-VOCA	4 May	
	MOARD	5 May	State Minister
	RED&FS	5 May	
	USAID	5 May	
	Oromiya BOARD	6 May	
Afar Region	Gewanie ATVET	6 May	Plant science head, 15 students interviewed
	BOARD (Semera)	6 May	Representatives interviewed
	RCBP	6 May	Representative interviewed
	Assayita Woreda Office of Agriculture and Rural Development (OOARD)	7 May	Head, 2 experts interviewed
	FTC, Assayita Woreda	7 May	2 DAs, farmers interviewed
Amhara Region	BOARD		
	Bure ATVET College		
	Bure Woreda OOARD		
	Farmer Training Center (FTC)		DAs, farmers interviewed
Benishangul-	Benishangul-Gumuz BOARD	7	Head, 5 experts

Location	Organization or individuals	Dates	Details
Gumuz Region		May	interviewed
	Asossa ATVET	10 May	Dean, Academic Vice Dean interviewed
	Assosa Woreda OOARD	8 May	Head, 5 experts interviewed
	Salamu Farmers Development Group, Kebele: Amba 12	10 May	DAs, farmers interviewed
	Amba 4 FTC	10 May	DAs, 6 farmers interviewed (1 female)
Oromia Region	Oromia BOARD	7 May	Vice bureau head, 1 expert interviewed
	Katargannat FTC, Assela Woreda	12 May	DAs, 8 male farmers interviewed
	Gare Development Group, Assela Woreda	12 May	10 male farmers interviewed
	Tiyo Woreda OOARD	13 May	Head, 4 experts interviewed
	Chiro ATVET	14 May	Dean, Vice Dean interviewed
	Chiro Woreda OOARD	14 May	Head, 4 experts interviewed
	Peasant Association, Chiro Woreda	15 May	DAs, 24 farmers (3 females)
	Arberekete Farmer Training Center, Chiro Woreda	15 May	3 DAs, 9 farmers interviewed
SNNP Region	SNNP Board	11 May	Head, extension head, experts interviewed
	SNNP Agricultural Research Center	11 May	Head, deputy interviewed

Location	Organization or individuals	Dates	Details
	Cooperative Development Agency	12 May	Head, expert interviewed
	Dilla ATVET	12 May	Acting head, students interviewed
	Gedeo Zone- Dilla Town	13 May	3 experts interviewed
	Dilla Zuria Worda OOARD	13 May	Head, deputy, extension head, experts interviewed
	Amba Kebele FTC	13 May	3 DAs, 2 farmers interviewed
	Chichu Kebele FTC	13 May	1 farmer interviewed
Tigray Region	Tigray BOARD	6 May	Head interviewed
	Wukro ATVET	7 May	HR head interviewed
	Wukro Woreda OOARD	7 May	Head, administrators, experts interviewed
	Genfel Farmer Training Center FTC, Wukro Woreda	8 May	DAs, farmers interviewed
	Atsibi Woreda OOARD	8 May	Acting head and extension coordinator interviewed
	Farmer cooperative, Atsibi Woreda	9 May	6 farmers interviewed
	FTC, Atsibi Woreda	9 May	3 DAs interviewed

APPENDIX B: LOGICAL FRAMEWORKS ON STRENGTHENING ATVETS AND THE EXTENSION SYSTEM

Table 1. Strengthening the ATVETs

Component/Problems	Objectives	Inputs	Outputs	Outcomes/Impacts
A. The curriculum is too wide, rigid, and very demanding on just three main disciplines (crop science, animal science and natural resource management) and thereby risking the trainees' practical relevance	1. To revise the curriculum by making it more demand-driven and practical-oriented; and to incorporate relevant competence building content in addition to the content of the three disciplines	1. To involve all the stakeholders and shareholders (ATVET, extension bureau, researchers, farmers) in curriculum review; and to include communication skills, farm management, community organizing, pedagogy, marketing producer groups; gender)	1. The revision will achieve a manageable and practical-oriented curriculum and multi-skilled DAs ready to use different skills of changing attitudes and behavior of DAs and subsequently farmers	1. An effective and relevant curriculum that ensures developing competent and practical DAs to support farmers to increase their productivity, household incomes, and sustainable use of their natural resources
B. Lack of sufficient operational funds to support the ATVET program	2. To generate sufficient operating funds from demonstration farms to make the ATVET financially sustainable and have an effective practical training facility	2. Each ATVET will need 2-3 years of operating funds until the demonstration farms become financially viable and stable	2. The ATVET will have sufficient operating funds to supplement the federal/regional allocation to conduct effective practical training for all trainees	2. The ATVET will be financially strong and able to provide incentives and operational resources to teachers
C. Lack of adequate information and communication technologies and facilities (ICT)	3. To establish information communication facilities and equipment libraries in	3. To establish two cybercafés, one for students and another one	3. Access to operational ICT equipment and facilities will improve	3. Introduction of ICT will greatly improve skills and knowledge of ATVET instructors and

Component/Problems	Objectives	Inputs	Outputs	Outcomes/Impacts
	all ATVET colleges for training, research and education	for teaching staff	the teaching and training performance of the ATVET instructors and result in enhanced quality and learning achievement	result in greater job satisfaction and stability.
D. Lack of training facilities and capital investment.	4. To partner with universities, research centers and NGOs with a view of overcoming resource constraints through facility and experience sharing	4. To devote time and expertise to building partnership in resource use with other partners particularly universities, research centers and NGOs	4. Identify partners for institutional collaboration in order to contribute to institutional capacity building. A focus of the training will be to develop plans that will examine the potential for developing collaboration.	4. Collaborations among partner institutions will sustain and increase institutional partnerships leading to availability of resources that will transform Agriculture from its current technology-limited state to a more technology-backed state
E. Lack of incentives and performance awards (salaries, allowances, etc). Individuals may not and perform better without having motivation	5. To create incentives which will retain the ATVET teachers in the workforce in training DAs	5. To make available allowances and to establish performance awards for outstanding tuition and service including opportunities for further education and training	5. ATVET instructors will be motivated and work towards improving their performance, including promoted to departmental headship and higher	5. The overall performance of the education and training system will improve, stabilize the teaching workforce and thereby contribute to well trained and competent DAs

Component/Problems	Objectives	Inputs	Outputs	Outcomes/Impacts
			level positions	
F. Poor leadership and management of the institutions	6. To provide training on leadership and management of the colleges including their resources	6. To provide suitable practical courses on leadership and management to college staff	6. The ATVET college leadership will improve its performance and efficiency of managing and utilizing resources (financial, human and social resources)	6. The overall performance of the education and training system will improve in supporting efficient management and utilization of resources into economically useful entities.
G. Inappropriate structure of coordination. Previously the colleges were under the MOARD and now some are under the TVET agency.	7. To review structure of coordination to ensure that flow of information, knowledge and communication is not interrupted thereby affecting student training.	7. To identify an appropriate structure for overseeing the operations and functions of all ATVETS to ensure efficient functioning and management of the colleges	7. An appropriate oversight institution will enable ATVET colleges to become stable and conducive institutions for training middle level manpower	7. The colleges will become professional institutions in training highly qualified DAs to serve farming households and rural communities
H. Weak coordination and scheduling of the apprenticeship program. It is held during off-season (October) and ends (June) when farmers are beginning to engage in main farming activities.	8. To enhance the apprenticeship program to provide apprentices with strong practical-based experience and exposure to farmers' field learning	8. To schedule the apprentice program for six months when farmers are doing main farming activities and allow supervision to be done by subject	8. Enhanced apprenticeship program, scheduled during farmers' main activities, will result in greater job competence by the DAs to work with	8. Practical attachment of the apprentices will be greatly improved and the combination of field experience and timing appropriateness with farmers' main activities will result in the DAs' greater

Component/Problems	Objectives	Inputs	Outputs	Outcomes/Impacts
	and working conditions	matter specialists and ATVET college teachers	model farmers; and provide feedback to the colleges.	preparedness to work with the farmers.
I. Weak linkages between the ATVET Colleges and the agricultural extension system	8. To enhance the linkage between ATVET Colleges and the agricultural extension system	8. To provide short-term courses and ins-service practical skill training to DAs at the FTC level	8. Strengthened linkages between the ATVET Colleges and the agricultural extension system	8. The linkages between ATVETS Colleges and DAs and FTCs will be greatly improved resulting in greater productivity

Table 2. Strengthening the Agricultural Extension System at the Woreda Level with Linkages to FTCs

Problems/ Constraints	Objectives	Inputs	Outputs	Outcomes/Impacts
A. Subject matter specialists (SMS) lack of practical training/experience about farming systems, including how to intensify & diversify these different farming systems to increase farm households (FH) income	1. To enhance the practical skills and knowledge of SMSs concerning how to intensify and diversify the farming systems within the woreda, especially in both high-value crops & livestock products and NRM practices	1. To provide in-service training and technical support for all SMSs about how farmers can intensify their farming systems (i.e. with focus on HVPs) and how to organize farmers into producer groups	1. SMSs will begin organizing and delivering more relevant training programs and technical support to DAs (and to farmers) within the woreda to enhance their extension activities within each kebele or FTC	1. The skills and knowledge of DAs will be enhanced; therefore, farm households (FHs) will accelerate the intensification and diversification of their farming systems; thereby increasing farm income
B. Lack of adequate physical facilities for training and providing technical and marketing support to farmers and development agents (DA), including providing access to technical and market information	2. To create an Agricultural Extension Resource Center (AERC) to serve as the focal point for the woreda extension system and to facilitate training and technical assistance (TA) activities between SMSs, DAs & farmers	2. To build (or transform) a large AERC center (about 70 m ²) w/ classroom, including at least 2 computers (w/Internet), 1 TV with DVD for training, an overhead projector plus training & resource materials, etc.	2. The capacity and expertise of the SMS staff will be enhanced, so they can access and provide up-to-date and relevant training, technical support and market information to DAs, model farmers, and the broader farming community	2. The technical training and expertise of the DA staff will be strengthened, so they can provide more up-to-date technical and market information to the farmers they serve and, thereby, help increase agricultural productivity & farm incomes
C. Lack of operating funds to purchase training materials, operate & maintain motorcycles, mobile phones, etc. to support both SMSs and supervisors	3. To improve technical and supervisory support of the woreda SMSs & supervisors through adequate travel and communication funds, plus motorcycles, to enhance their technical	3. Where needed, to procure motorcycles, plus allocate sufficient recurrent operating funds to support travel and communication requirements of the SMS and	3. SMSs and supervisors will make regular visits to each FTC to provide technical and supervisory support to the DA staff, as well as for SMSs to conduct special training	3. The effectiveness of the overall extension system will be strengthened, which will accelerate increases in agricultural productivity, improvements in farming systems, and increases in FH income

Problems/ Constraints	Objectives	Inputs	Outputs	Outcomes/Impacts
	support services to DAs throughout the woreda	supervisors. (However, the source of recurrent operating funds is unclear)	programs for model and women farmers, especially on HVPs and NRM practices	
D. Low salaries and very limited or no performance incentives	4. To motivate the SMS and supervision staff to provide strong and regular technical, management & supervision support to DAs	4. To establish a performance based award & promotion system to recognize outstanding SMSs and supervisors at the woreda, zonal and regional levels, as well as make available per diem & other incentives to enhance staff income	4. SMSs and supervisors will be motivated to improve their performance in providing training, technical support and regular supervisory support services to the DA staff	4. The effectiveness of the overall extension system will be strengthened as woreda extension workers provide better support and supervisory services to DAs and to the broader farming community.

Table 3. Strengthening the Ethiopian Agricultural Extension System with Primary Focus on the Farmer Training Centers at the Kebele Level

Component/Problems	Objectives	Inputs	Outputs	Impacts
I. Farmer Training Centers				
A. DAs lack of practical training/experience about farming systems (FS) and how to intensify/diversify farming systems to both ensure national food security (NFS) and to increase farm household income (FHI)	1. To strengthen the skills and knowledge of current DAs re: how to intensify & diversify FSs with high-value crops/livestock products (HVPs), agric. marketing, value-chains, etc. plus soft-skills, such as active teaching/learning skills & organizing producer groups (social capital)	1. To identify and then utilize competent trainers, either SMSs, ATVET teachers or other specialists to conduct in-service training courses for DAs in these key technical & “soft” skill areas	1. DAs will become skilled and competent in providing training and technical support to farmers about high potential HV crops and livestock, as well as how to organize producer groups (PGs) in “linking farmers to markets,” including rural women.	1. Farmers will learn the necessary skills/knowledge to intensify/diversify their farming systems and then how to market these products in increasing farm income and using improved NRM practices to ensure the long-term sustainability of their land/water resources
B. Demonstration farms (DFs, which are generally between 1-2.5 ha) are poorly developed and/or not focused on high-value (HV) crops, livestock and other products aimed at increasing farm household (FH) income; nor are most FTCs using needed irrigation and proper NRM practices	2. To transform the DFs into an effective teaching-learning mechanism in teaching farmers how to produce HVPs, as well as how to use needed NRM practices; also, to operate demonstration farms as an economic enterprise to generate needed operating funds for FTC.	2. DAs will have to be trained in farm mgt. skills and applicable HV crops & livestock practices, as well as NRM practices, such as drip irrigation, etc. Also, each FTC will need up-front investment capital and operating funds (2 yrs) to establish economically viable DFs.	2. DAs will be able to provide practical, hands-on training for all types of farmers, including farm women and rural youth in HV crop and livestock systems, and sustainable NRM practices. Also, within 2 years, most DFs will be making a sufficient revenue to cover all FTC operating costs.	2. Farmers will: a) intensify and/or diversify their FSs, and, thereby, increase their agricultural productivity and farm incomes; thereby increasing their access to inputs, as well as improving family nutrition. Also, if successful, these DFs will generate sufficient revenue to cover all FTC operating costs

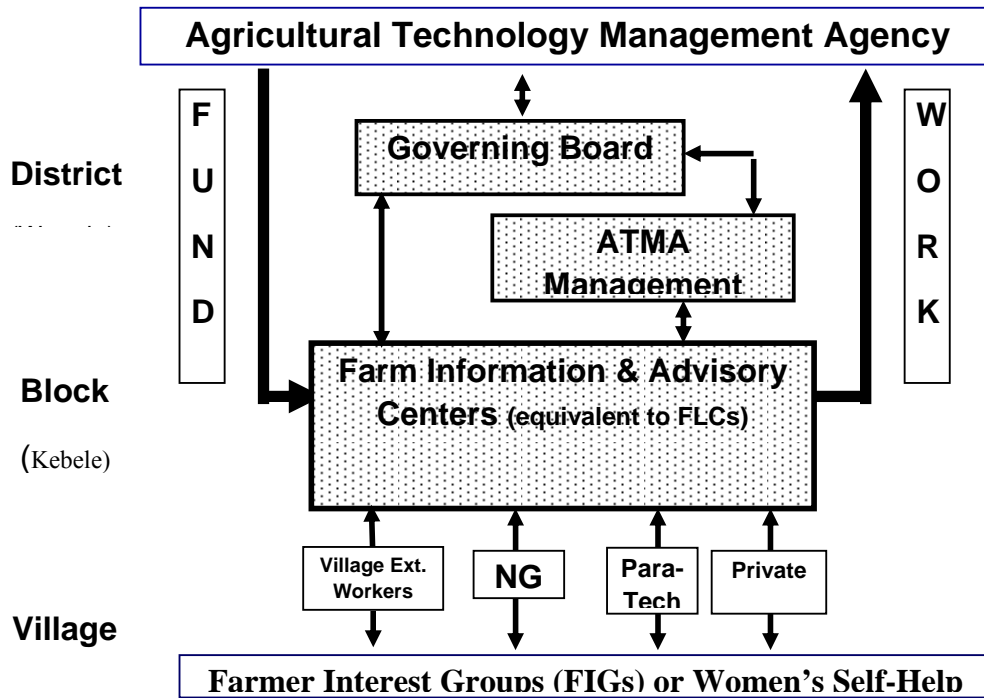
Component/Problems	Objectives	Inputs	Outputs	Impacts
C. Lack of operating funds to purchase FTC training materials, inputs for the demonstration farm, mobile phone credit, etc.	3. To generate sufficient operating funds from the DFs to make the FTC financially self-sustainable	3. Each FTC will need 1-2 years of operating funds until the DF becomes economically viable	3. DAs and the FTC will have sufficient operating funds to conduct effective practical extension and training for all FHs with the kebele	3. The FTC will be financially self-sufficient and able to provide additional incentives and operational resources for use by the DAs
D. DA staff lack of mobility to visit villages within the kebele	4. To enable the DAs to make regular visits to all villages within the kebele so they can provide needed technical assistance (TA) and training, especially to the emerging PGs for both major food crops and emerging HVPs	4. To provide heavy-duty bicycles to enable DAs to make regular farm visits, so they can increase technical support and services to interested FHs and emerging PGs	4. DAs will make more efficient use of their time in providing TA directly to FHs and PGs, rather than making fewer visits and spending 30% or more of their time walking to the different villages	4. FHs and PGs will increase their technical, social and marketing skills as they receive more training and technical support in pursuing new HVP; also, these emerging PGs will help link farmers to markets and, thereby, increase FH income
E. Low DA salaries and little or no performance awards and/or incentives for high performing DAs	5. To improve the morale and professional commitment of the DAs, so they can be motivated to continue providing useful extension services to all FHs within the kebele	5. To increase in-service educ. opportunities (B.Sc.); also, to make available per diem to DAs (from DF revenues) so they can increase their farm visits; and to initiate new performance awards for outstanding service	5. DAs will pursue long-term careers in extension and will begin working harder to improve their skills and performance, including being promoted to supervisory, SMS and higher administrative positions	5. improving the performance of the extension system will have a positive impact on reducing rural poverty, increasing FH income, improving national food security and contributing to overall agric. development
F. Staff instability or	6.To reduce the	6. Where	6. DAs	6. Increased job

Component/Problems	Objectives	Inputs	Outputs	Impacts
high turn-over of DA staff at the FTC or kebele level, largely due to the random assignment of DAs to woredas far from their homes	repeated transfer of DAs between different kebeles, so DAs can develop more effective extension programs and develop a more financially sustainable DFs and FTCs	feasible, assign new DAs to a FTC in their home woreda to reduce staff turnover	assigned to FTCs within their home woredas will be more satisfied and have improved job performance since they will be accountable to local farmers in their home woreda	stability will improve the overall performance of the extension system in serving the needs of farmers in their respective kebeles and woredas
G. Lack of adequate physical facilities at most FTCs, including classrooms, offices, livestock buildings and, especially, the very inadequate DA housing	7.To improve the FTC training facilities and improve the housing facilities for the DA staff	7. To build and/or equip FTC training facilities (classroom), teaching equipment and practical training facilities (e.g. livestock buildings, deep wells); also, to build, furnish and improve the housing facilities for the DA staff	7. Improved classrooms, with simple teaching equipment and materials, will improve the teaching performance and confidence of the DAs; improved housing will result in greater job satisfaction and willingness of the DAs to stay in local communities	7. Classroom and practical training of farmers will be greatly improved due to the combination of improved teaching facilities; also improved housing/living facilities will result in greater job satisfaction and stability.
H. Lack of attention and service being provided to rural women, since many do not meet the current “training” selection criteria (i.e. 8 th grade education)	8.To enable rural women, especially female-headed FHs, to have full access to all extension activities that will increase their technical, mgt & marketing skills and, thereby, increase their FH income	8. To provide suitable practical training courses and technical services for all rural women on horticultural crops, poultry and other HVP that women typically	8. Rural women learn new skills to begin producing poultry, vegetables (backyard gardening), and other HVPs and then start working together in PGs to start marketing these	8. Rural women will increase FH income, start working together in producer groups, and increase their social status with FHs and communities

Component/Problems	Objectives	Inputs	Outputs	Impacts
		produce	different HVPs	
I. Lack of appropriate field ware that reflects the DAs role in providing training and technical advisory services to all FHs	9.To enhance the attitudes of DAs as professional extension workers that are contributing directly to agricultural and rural development	9. To provide each DA with appropriate field ware that is suitable in providing training and technical advisory services to both FHs and producer groups	9. DAs will improve their job performance and attitudes, and be willing to continue working to enhance their knowledge, skills and job performance	9. Extension will become a more professional agency in serving FHs and rural communities throughout Ethiopia.

APPENDIX C. EXAMPLES FROM INDIA OF DECENTRALIZED EXTENSION

Structure of the Decentralized Agricultural Technology Management Agency (ATMA) in India



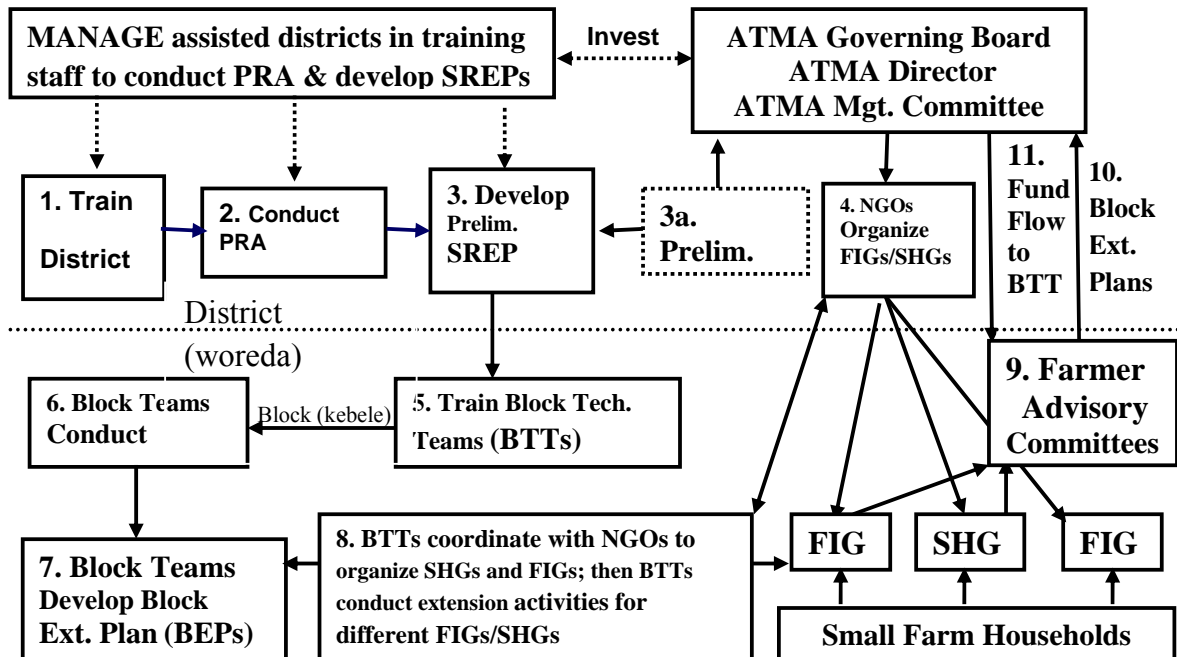
Source: Singh, Swanson, and Singh 2006

Note: Prior to the introduction of the ATMA model in India, nearly all “operational” funding for extension programs came from the central government in the form of pre-defined or “ear-marked” extension activities, such as fertilizer demonstration packages or new irrigation technologies (generally in the form of subsidized inputs). Because these pre-allocated government funds for very specific extension program activities were channeled through separate line departments (agriculture, animal husbandry, horticulture, etc.), then the district- and sub-district extension staff had no other program funds available to address local needs and opportunities that would be of potential value to different farmer groups within their service area. Therefore, one central feature of the World Bank financed National Agricultural Technology Project (NATP) was to pilot-test this new decentralized extension model where program funds were transferred directly to these new, semi-autonomous, registered ATMAs, as illustrated above. Therefore, after each Block Technology Teams (BTTs; equivalent to DAs at the kebele level) developed their annual work plans, in close consultation with and approval by the local Farmer Advisory Committee (FAC), then these proposed work plans would be sent directly to the ATMA (i.e. first through the ATMA management committee and then to the Governing Board, composed of stakeholder representatives) for final approval and funding. Therefore, once these work plans were approved by the ATMA, then these program funds were transferred directly back to each BTT, so these front-line extension field staff could implement these locally generated and approved extension programs.

Procedures Used in India to Train the Extension Staff at the District and Sub-District Levels to Implement a Decentralized, Farmer-led, Market-driven Extension System

As agricultural extension systems are *decentralized*, the job responsibilities of extension staff members change significantly at each system level. Especially at the district and sub-district levels, the extension staff will need to carry out important new planning functions in collaborating with local farmer groups if this more decentralized extension system is to be successfully implemented. In most cases, the field staff will be unfamiliar with these participatory methods and will need direct training and technical assistance in learning how to carry out these new tasks. To understand how to introduce these *participatory procedures*, the following diagram outlines the process used in India to actually introduce these methods and procedures to the field extension staff, as carried out under the World Bank funded National Agricultural Technology Project (NATP). Then, on the following page, the implementing procedures used to make this extension system more *market-driven* are illustrated. For more information on all of these procedures, see: Singh, Swanson, and Singh, 2006. p. 203-223

Procedures Used to Train the Extension Staff at the District and Block Levels to Implement this Decentralized, Farmer-led, Market-driven Extension System in



Procedures Used to Develop a More Market-Driven Extension System in India¹

Terms used: ATMA=Agricultural Technology Management Agency (district level registered organization that coordinated all agricultural research and extension activities within the district; PRA=Participatory Rural Appraisal; AMC= ATMA Management Committee; SREP=Strategic Research and Extension Plan for the district (woreda) level; BTT=Block Technology Team (equivalent to DAs at FLC level); FIGs=Farmer Interest Groups (FIGs will transform into producer groups after the first growing season, once the members have been successfully trained by the field extension staff); and HVC/P=High-value crops/products) KVK=Farm Science Center (multidisciplinary team of researchers at the district or woreda level)

Note: There are four axioms that are essential to a successful market-driven extension system:

- The *first axiom* is that if there isn't a market; don't encourage farmers to produce a specific crop or product. Therefore, the first task to be carried out is to assess the potential markets for different high-value crops or products that can be successfully produced in different blocks within the district.
- The *second axiom* is that if farmers cannot easily transport the product to market; look for more promising products that can be more easily marketed.
- The *third axiom* is that if the crop (or product) cannot be successfully grown or produced within the district due to unfavorable agro-ecological conditions, then look for more promising crops or products that are well suited or better suited to each district and block (e.g. kebele).
- The *fourth axiom* is to diversify into a variety of different high-value crops/products that are suitable for different Farmer-Interest-Groups (FIGs, generally men farmers in India) or Women's Interest Groups (WIGs) within the district. This approach will mitigate risk by not saturating the market with one or two products and, thereby, driving down prices.

¹ Source: Singh, Swanson, and Singh, 2006. p. 203-223.

APPENDIX D. ANNOTATED BIBLIOGRAPHY

Reference	Findings	Implications/ remarks/ questions
<p>*Abate, H. (2007). <i>Review of Extension Systems Applied in Ethiopia with Special emphasis to the Participatory Demonstration and Training Extension System</i>. Food and Agriculture Organization of the United Nations.</p> <p><u>Background/details:</u> Review extension approaches & identify strengths</p>	<p>Both public and NGO extension important</p> <p>FTC should be focal point for all actors in innovation system</p> <p>Groups are important</p> <p>Different clientele have different interest</p> <p>Need best fit approaches for various agro-ecosystems (objectives, structure, methods, etc.)</p> <p>Rural not “agricultural” extension promotes HIV & other cross-cutting issues</p> <p>DA to be communicator for innovation not tech. transfer person</p> <p>Need for networking, social learning, negotiation between DA & clientele</p>	<p>Need more learning in skills for innovation</p> <p>NGOs are in pastoral areas but not public; dual public/private systems for here?</p> <p>At least bring NGOs “into the fold”</p> <p>More participation needed</p>
<p>Abegaze, S., A. Tola, and S. Demeke. 2004. <i>The balance between middle and high level human resource training in the agricultural sector of Ethiopia</i>. In Proceedings of the 13th Annual Conference of the Ethiopian Society of Animal Production (ESAP), Addis Ababa, Ethiopia, August.</p>	<p>Will need higher agricultural education to implement ADLI policy</p> <p>In 5 years 150,000 people need to be trained at intermediate level</p> <p>ATVETs responsible for intermediate training; currently only meet half of the projected requirement</p>	<p>Opportunity for private sector to step in</p> <p>Extension needs ATVETs/ intermediate level training</p>
<p>Aberra, A. and Teshome, A. 2009. <i>The Agricultural/Pastoral</i></p>	<p>Proposes operational model for</p>	<p>Specialized vs. generalized</p>

Reference	Findings	Implications/ remarks/ questions
<p><i>Extension System in Ethiopia: Opportunities, Challenges and Future Prospects.</i> Draft Report of a Panel Discussion, March 09, Addis Ababa.</p>	<p>FTC</p> <p>Irrigation extension left out; marketing not in curricula</p> <p>Suggest additional DA courses like policies, communication</p> <p>FTCs need monitoring and support</p> <p>3 types of DAS: (1) trained under previous system & now upgraded (experienced); (2) DAs trained at federal ATVETs; (3) DAs trained at regions</p>	<p>DA debate</p> <p>Institutional pluralism needs to be considered</p> <p>**Need for independent evaluation—is this our study?</p> <p>**Need to compare federal to regional TVTs</p>
<p>*Ashworth, V. (2005). <i>The Challenges of Change for Agricultural Extension in Ethiopia.</i> A Discussion Paper. Federal Democratic Republic of Ethiopia. Addis Ababa.</p> <p><u>Background/details:</u> Discussion paper focused on change for the World Bank</p>	<p>Need a strategic vision for future of extension</p> <p>Current focus on production and high inputs</p> <p>“Modern technologies = instant commercial farmers” mindset</p> <p>Farmers need business, management, analytical not just technical skills</p> <p>Need demand-driven operational paradigm</p> <p>Access to information underdeveloped</p> <p>Pay attention to gender</p> <p>Mature extension = pluralistic extension</p>	<p>Diverse country- no one size fits all</p> <p>More decentralization, participation- develop core participatory team in each region</p> <p>Change mindset; farms > production units</p> <p>Need more capacity</p>
<p>*Bekele, E., Ponniah, A., and Kisamba-Mugerwa, W. (2006). <i>Review of Agricultural Extension Impacts in Ethiopia.</i> Prepared for the World Bank Office, Addis Ababa.</p> <p><u>Background/details:</u> Review for World Bank</p>	<p><i>Mixed results</i>, but: PADETES has brought <i>significant achievements</i> including: increased production of food grains; rise in fertilizer and improved seeds use; increased number of households participating in extension packages; and increased promotion and implementation of agricultural commodity development, specialization and</p>	<p>We have to go beyond numbers and adoption, seed and fertilizer to increased capacity to demand services (farmers) and to provide holistic services (DAs)</p> <p>More focus on marketing, community participation, learning</p>

Reference	Findings	Implications/ remarks/ questions
	<p>diversification plans</p> <p><u>Positive developments:</u> decentralization & capacity building at <i>woredas</i>; MoARD structure bringing partners together; formation of marketing division in MoARD; increased community participation via FTCs; transformation from subsistence to market oriented agriculture; recent focus on capacity building,. institutional learning = improved # & quality of DAs</p>	
<p>Bernard, T., Gabre-Madhin, E. and Taffesse, A.S. (2007). <i>Smallholders' Commercialization through Cooperatives. A Diagnostic for Ethiopia</i>. IFPRI Discussion Paper 00722. Washington, D.C: International Food Policy Research Institute.</p> <p><u>Background/details:</u> Empirical study covering entire country on cooperatives</p>	<p>Despite the spread of cooperatives – they existed in less than 15% of districts in 1994 and nearly 35% in 2005 – there are important disparities across regions. Within regions, cooperatives tend to be located in areas that already have better access to markets and lower exposure to price and environmental risks.</p> <p>At household level participation is only 9%, with poorer households less likely to participate.</p> <p>While cooperatives obtain higher prices for members, they are not associated with a significant increase in the overall share of cereal production sold by their members.</p> <p>These average results hide considerable heterogeneity in the impact across households.</p> <p>Smaller farmers tend to reduce their marketable surplus as a result of higher prices, while the opposite is true for larger farmers.</p>	<p>Big diversity in the country</p> <p>Cooperatives may not be the answer to farmer organization for extension</p>
<p>Buchy, M. and Basaznew, F. (2005). <i>Gender-blind</i></p>	<p>In spite of gender training/mainstreaming, BoARD</p>	<p>No gender policy or awareness</p>

Reference	Findings	Implications/ remarks/ questions
<p><i>Organizations Deliver Gender-biased Services: The Case of Awasa Bureau of Agriculture in Southern Ethiopia.</i> Gender, Technology and Development. SAGA Publications.</p>	<p>fails to involve women in extension</p> <p>Gender considerations missing at all levels of organization</p>	<p>Limited transparency & participation</p> <p>Need systemic gender sensitization</p>
<p>Carlsson, F., Kohlin, G., Mekonnen, A. and Yesuf, M. (2005). <i>Are Agricultural Extension Packages what Ethiopian Farmers Want? A Stated Preference Analysis.</i> Working Papers in Economics no. 172. Department of Economics, Goteborg University.</p> <p><u>Background/details:</u> Stated preference survey</p>	<p>People prefer public goods to extension package, unless combined with insurance</p>	<p>Extension “packages” may not always be what farmers want/need</p> <p>Participation/demand-driven focus needed</p>
<p>Davis, K, Ekboir, J. M., Mekasha, W., Ochieng, C. Spielman, D. J., and Zerfu, E. (2007). <i>Strengthening agricultural education and training in Sub-Saharan Africa from an innovation systems perspective: Case studies of Ethiopia and Mozambique.</i> IFPRI Discussion Paper 00736. Washington, D.C: International Food Policy Research Institute.</p> <p><u>Background/details:</u> Case study of AET</p>	<p>AET conventionally viewed for building human & scientific capital, but has vital role in building capacity of organizations & individuals to transmit & adapt new applications of existing information, new products & processes, & new organizational cultures and behaviors.</p> <p>Importance of improving AET systems by strengthening the innovative capabilities of AET organizations and professionals; changing organizational cultures, behaviors, & incentives; & building innovation networks and linkages</p>	<p>Need new ways of thinking</p> <p>Innovation systems approach</p> <p>Need capacity</p>
<p>Dercon, S., Gilligan, D. O., Hoddinott, J. and Woldehanna, T. (2008). <i>The Impact of Roads and Agricultural Extension on Consumption Growth and Poverty in Fifteen Ethiopian</i></p>	<p>Receiving at least 1 visit from DA raised consumption growth by 7%, reduced poverty 10%</p>	<p>Extension is important!</p>

Reference	Findings	Implications/ remarks/ questions
<p><i>Villages</i>. Washington, D.C: IFPRI Discussion Paper 00840. International Food Policy Research Institute.</p> <p><u>Background/details</u>: Econometric modeling/survey</p>		
<p>Efa, N., Gorman, M., and Phelan, J. (2005). <i>Implications of an Extension Package Approach for Farmers' Indigenous Knowledge: The Maize Extension Package in South-western Ethiopia</i>. Journal of International Agricultural and Extension Education. 12 (3) pp. 67-78.</p> <p><u>Background/details</u>: Qual/quant package study</p>	<p>Indigenous knowledge (IK) (local maize, informal seed systems, traditional pest control) disappearing, due in part to promotion of modern packages</p> <p>Extension and research personnel prefer modern methods</p>	<p>Pay attention to IK</p> <p>Acknowledge & take advantage of diversity</p> <p>Need changed mindset by research and extension to IK</p>
<p>*Ethiopian Economic Association/Ethiopian Economic Policy Research Institute. (2006). <i>Evaluation of the Ethiopian Agricultural Extension with Particular Emphasis on the Participatory Demonstration and Training Extension System (PADETES)</i>. Addis Ababa.</p> <p><u>Background/details</u>: Country-wide survey</p>	<p>Majority of extension packages crop production; supply driven</p> <p>Packages formulated at federal level</p> <p>Lack of regional strategies</p> <p>DA training inadequate; need more practical; they use individual methods</p> <p>Disadoption of packages 72%</p> <p>Approach not participatory</p> <p>Distribution channels/institutions flawed; formal seed weak; input & output marketing lacking; transport: monopolies</p> <p>Not meeting ADLI objectives</p> <p>Leaving out cash crops, NRM, livestock, private & NGOs</p> <p>Gender and culture left out</p> <p>DAs do non-extension activities</p>	<p>Need capacity/training at lower levels and for DAs</p> <p>Need strategies, planning, M&E</p> <p>Need participation/training</p> <p>Reach out to pastoral areas</p> <p>Need baseline survey</p> <p>Need research extension advisory council</p> <p>Focus on and equip farmer organizations</p> <p>Use local institutions</p> <p>Land tenure: deal with</p> <p>Need policies on marketing</p> <p>Encourage pluralism</p>
<p>FAO. (2008). <i>Key messages from</i></p>	<p>PADETES not implemented</p>	<p>Need pluralism, coordination</p>

Reference	Findings	Implications/ remarks/ questions
<p><i>a Study on Ethiopia's Extension Systems</i>. Based on the Work of Habtemariam Abate. Document ET-TRS-08/ext/02. Project: TCPF/ETH/3101. Food and Agriculture Organization of the United Nations Sub Regional Office for Eastern Africa and FAO Representation in Ethiopia. Addis Ababa.</p> <p><u>Background/details:</u> Review</p>	<p>properly</p> <p>New initiatives: ICT, marketing/credit institutions, Ethiopian Commodity Exchange (ECX) good</p> <p>NGOs have many innovative & participatory approaches</p> <p>Both NGOs and government systems viable</p>	<p>of extension</p> <p>Suggest operation model of DA</p> <p>FTC to be focal area/platform</p> <p>?How do de-politicize FTCs?</p> <p>Focus on groups</p> <p>Need communication strategies</p>
<p>FAO. (2008). <i>Lessons of the Asian Green Revolution for Ethiopia's Agricultural Extension and 15 Key Messages on Extension in Ethiopia</i>. PowerPoint Highlights. Document ET-TRS-08/ext/06. Project: TCPF/ETH/3101. Food and Agriculture Organization of the United Nations Sub Regional Office for Eastern Africa and FAO Representation in Ethiopia. Addis Ababa.</p> <p><u>Background/details:</u> Based on Kalim Qamar's work</p>	<p>Extension must be backed up by policies</p> <p>Investment in subsidies is good</p> <p>Focus on high-potential areas, not all over</p> <p>Important to reduce risk (irrigation, stable prices, etc.)</p> <p>Need practical links between institutions</p> <p>Extension must be mobile</p> <p>Marketing and diversification essential</p> <p>Look at urban & peri-urban agriculture</p> <p>Must include other topics: HIV, NRM, population</p> <p>Must include women & youth</p>	<p>Location-specific approaches (best fit)</p> <p>Put marketing agents at extension centers</p> <p>Separate extension from regulation</p> <p>Avoid rivalry between commodity & extension depts.</p> <p>Capacity building essential</p> <p>Links to agricultural education, marketing, credit, not just research</p>
<p>Ferguson, A., and Romboli, S. (2004). <i>Environmental and Social Management Framework</i>. E889. Rural Capacity Building Project. The Federal Democratic Republic of Ethiopia.</p> <p><u>Background/details:</u> Project document</p>	<p>The Rural Capacity Building Project (RCBP) major investment in agricultural sector, organized into 4 components:</p> <p>1. <i>Technical and Vocational Education and Training for Agriculture</i> -(US\$30 Million): finance recurrent expenditure; civil works for upgrading & maintenance of existing vocational</p>	<p>Government is investing heavily in capacity</p> <p>Capacity must be beyond head training to teaching problem solving, critical thinking, systems perspectives</p> <p>Need to focus on capacity at woreda and kebele levels</p>

Reference	Findings	Implications/ remarks/ questions
	<p>colleges & construction of new buildings at existing colleges; procurement of goods & services; & long term & short-term training to upgrade skills of teaching staff</p> <p><i>2. Agricultural Advisory Services at Farmers Training Centers-</i> (US \$55 Million): finance recurrent expenditure, civil works for upgrading & maintenance of existing FTCs & construction of new centers; procurement of goods and services; and long-term and short-term training to upgrade skills of extension staff</p> <p><i>3. Agricultural Research -</i> (US\$ 10 Million): finance recurrent expenditure, civil works for upgrading and maintenance of existing federal & regional research centers; procurement of goods & services; & long-term & short-term training to upgrade skills of federal & regional research staff.</p> <p><i>4. Institutional Capacity Building -</i> (US\$ 5 Million):finance training programs, study tours, workshops, provide technical assistance in financial administration, governance, procurement, accounts, management information system, M&E</p> <p>Finance training & assistance to increase capacity of cooperatives, farmers' organizations & local communities to effectively manage farmers training centers & in contracting & evaluating the performance DAs</p>	
<p>Gebre-ab, Neway. (2006). <i>Commercialization of Smallholder Agriculture in Ethiopia</i>. EDRI Notes and Paper</p>	<p>Commercialization seen by GOE as focal point of agricultural Development</p>	<p>Land tenure an issue</p> <p>Lack of information a problem</p>

Reference	Findings	Implications/ remarks/ questions
Series No.3. Ethiopian Development Research Institute. Addis Ababa		Cooperatives aggregate output Risk and uncertainty affect farmers
*Gebremedhin, B., Hoekstra, D., and Tegegne, A. (2006). <i>Commercialization of Ethiopian Agriculture: Extension Service from Input Supplier to Knowledge Broker and Facilitator</i> . IPMS Working Paper No. 1. Improving Productivity and Market Success of Ethiopian Farmers project, International Livestock Research Institute (ILRI). Nairobi, Kenya. <u>Background/details:</u> PRA in 8 woredas of 4 main regions to assess extension service development, & analyze approaches & processes	Strategy: transform from subsistence to market-oriented agriculture Undergoing transition to FTCs Government (<i>woreda</i> level) provides most extension While market-oriented in talk, food-security oriented in action Main focus production-oriented package approach (household, regular & minimum are the 3 main packages) Major problems: top-down, non-participatory approach, primarily supply driven, low capacity of experts & DAs, low morale, high turnover, shortage of operational budget & facilities	Fit service to market-oriented strategy Develop pluralistic, interactive, market-oriented operational models Create agricultural innovation teams at the federal & regional levels to help develop innovative approaches & capacities at the woreda level Keep updating ATVET curricula based on learning process
Kassa, B., and Abebaw, D. (2004). <i>Challenges Facing Agricultural Extension Agents: A Case Study from South-western Ethiopia</i> . African Development Bank. Blackwell Publishing Ltd. <u>Background/details:</u> Empirical study in SW Ethiopia	PADETES not participatory 1:1090 ratio DA to farmer ratio; coverage inadequate Constraints to adoption = high input prices, lack of inputs, late delivery of inputs, no materials or transport for extension, limited skills/experience, technologies unsuitable	No one size fits all strategy Need adaptive trials Bottom up not top down Need capacity for DAs
Kassa, B. 2004a. Postgraduate training in agricultural sciences in Ethiopia. <i>Higher Education Policy</i> 17: 49–70.	Shortage of experienced & qualified instructors, brain drain, lack of finances, equipment & library negatively affected post-graduate programs	Systemic problem of education in Ethiopia
Kassa, B. 2004b. <i>Linkages of higher education with</i>	While higher education institutes have contributed to agricultural	Need massive mindset changes in entire agricultural

Reference	Findings	Implications/ remarks/ questions
<p><i>agricultural research, extension and development</i>. Unpublished manuscript, Alemaya University, Alemaya, Ethiopia.</p>	<p>sector, curricula no longer relevant & unable to respond to labor market and current realities</p>	<p>innovation system</p>
<p>Kassa, B. (2003). Agricultural Extension in Ethiopia: The Case of Participatory Demonstration and Training Extension System. <i>Journal of Social Development in Africa</i>. 18 (1) pp. 49-84</p>	<p>Same as Kassa (2002).</p>	
<p>Kassa, B. (2002). <i>Constraints to Agricultural Extension Work in Ethiopia: The Insiders' View</i>. S. Afr. J. Agric. Ext./S. Afr. Tydskr. Landbouvoorl., (31), pp. 63-79.</p> <p><u>Background/details:</u> Historical review & survey examines principal obstacles to agricultural extension work in Ethiopia.</p>	<p>Extension programs and policies formulated without consideration of farmers' opinion</p> <p>Various extension approaches biased against livestock</p> <p>Research and extension activities carried out by different organizations without coordination</p> <p>Not participatory</p> <p>Research-extension linkage poor</p> <p>Extension agents involved in activities not related to normal duties</p> <p>Number of extension workers in the country is small</p> <p>Qualification & communication skills of DAs inadequate</p> <p>Host of factors, most policy related, obstruct DAs from work</p>	<p>Participation</p> <p>Linkages</p> <p>Expectations of DAs should change</p>
<p>Kassa, H. 2005. Historical Development and Current Challenges of Agricultural Extension with Particular Emphasis on Ethiopia. Ethiopian Economic Association (EEA)/Ethiopian Economic Policy Research Institute (EEPRI) Working Paper No.</p>	<p>Radical shifts of policy: feudalism – Marxism – free market</p> <p>Donor-driven changes too</p> <p>Challenges are policy-related, user environment, institutional, & technical</p>	<p>Extension needs to evolve</p> <p>Must actively engage stakeholders</p> <p>Need co-learning process where individuals & institutions learn from experience</p>

Reference	Findings	Implications/ remarks/ questions
2/05. Addis Ababa: EEA/EEPRI.		
Kelemework, Fasil Wubneh. 2007. Realizing the Dream: Agricultural Extension for Rural Livelihoods Development in Ethiopia. Institute of Social Sciences Graduate School of Development Studies MA Thesis.	<p>Despite efforts livelihoods unchanged</p> <p>In all 3 historic extension regimes extension is production oriented, focusing on technology supply strategies to increase agricultural production & productivity.</p> <p>Role of extension to promote agricultural inputs using various methods & approaches.</p> <p>Most efforts were top down, donor driven & biased to few crop technology packages & highly influenced by the respective political systems</p>	<p>We need participation and demand from the bottom</p> <p>Get away from production/input focus</p>
Kelemework F. and H. Kassa (2006) Assessment of the Current Extension System of Ethiopia: A Closer Look at Planning and Implementation, Issue paper 2/2006. Ethiopian Economic Association/ Ethiopian Economic Policy Research Institute (EEA/EEPRI). Addis Ababa.	<p>The period is also known to have an aggressive extension intervention & total # of participant farmers reached was reported at 4.2 million from a total of about 10 million small scale farmers in the country (Kelemework and Kassa, 2006)</p>	<p>Government focused on extension but maybe need to change methods/approach/mindset</p>
Lemma, M. and Hoffmann, V. 2005. The Agricultural Knowledge System in Tigray, Ethiopia: Empirical Study about its Recent History and Actual Effectiveness. Conference on International Agricultural Research for Development. Deutscher Tropentag, Stuttgart-Hohenheim, October 11-13.	<p>National Extension Intervention Program (NEIS) starts with tech identification & packaging rather than understanding farming system, complexities of local areas</p> <p>Packages lack agro-ecological specificity</p> <p>Should help farmers adapt</p>	<p>Move from packages to options approach, from persuasion to communication</p> <p>DAs need commitment</p> <p>DAs not supported by supervisors who are focused on results</p> <p>Performance indicators need revision</p>
Spielman, D. J., K. E. Davis, M. Negash, and G. Ayele. (2008). Rural Innovation Systems and Networks: Findings from a Study of Ethiopian Smallholders. IFPRI	<p>Go beyond technological to institutional innovation</p> <p>Innovation processes dependent on state intervention</p>	<p>Need to further explore policies & programs to create space for market & civil society actors to participate in smallholder innovation</p>

Reference	Findings	Implications/ remarks/ questions
<p>Discussion Paper No. 00759. Washington, DC: International Food Policy Research Institute.</p> <p><u>Background/details:</u> Empirical piece to examine smallholder innovation networks</p>	<p>State may be crowding out other actors</p> <p>Need policies & programs to strengthen innovative capabilities</p>	<p>networks</p>
<p>Spielman, D., J. Ekboir, K. Davis, C. O. Ochieng. (2008). An innovation systems perspective on strengthening agricultural education and training in sub-Saharan Africa. <i>Agricultural Systems</i> 98: 1-9.</p>	<p>Ag Ed & training should go beyond building human & scientific capital to building capacity of organizations & individuals to transmit & adapt new information, products, processes, & organizational cultures, & behaviors</p>	<p>Innovation systems thinking</p> <p>Organization & management of extension</p> <p>Incentives</p>
<p>Spielman, D. J., M. Negash, K. Davis, and G. Ayele. (2007). Agricultural innovation in Ethiopia: A systems overview of opportunities and constraints. In E. Wale, S. Regassa, D. Gebre-Michael, and B. Emana, <i>Reversing rural poverty in Ethiopia: Dilemmas and critical issues. Proceedings of the 9th annual conference of the Agricultural Economics Society of Ethiopia</i>, pp. 193-213.</p>	<p>Ethiopia's innovation system growing in complexity: new actors, policies, technologies, relationships</p> <p>Opportunities for synergies exist</p> <p>Unknown how this will affect the poor</p>	<p>Synergy will require policy, organizational, & institutional mechanisms</p> <p>Baseline survey would help to assess effects of new programs on the poor</p>
<p>Spielman, D.J., M. Negash, K. Davis, and G. Ayele. (2006). The smallholder farmer in a changing world: The role of research, extension and education in Ethiopian agriculture. Ethiopian Strategy Support Program (ESSP) Policy Conference Brief No. 12. Addis Ababa: IFPRI-EDRI.</p> <p><u>Background/details:</u> Empirical piece to map agricultural.</p>	<p>Public sector single most important source of innovation for smallholders</p> <p>But private companies & CSOs becoming increasingly important</p> <p>Cooperation among different public agencies, & between public agencies & private sector & civil society weak</p> <p>Policies on science/technology & business/investment have yet to provide incentives to stimulate investment in pro-poor</p>	<p>Importance of partnership in improving smallholder livelihoods</p> <p>Capacity</p> <p>Policies</p>

Reference	Findings	Implications/ remarks/ questions
innovation system of Ethiopia	<p>partnerships</p> <p>Limited capacity at all levels of the system—federal, regional & local—makes cooperation & policy implementation difficult.</p>	
<p>Torkelsson, A. (2007). Resources, Not Capital: A Case Study of the Gendered Distribution and Productivity of Social Network Ties in Rural Ethiopia. <i>Rural Sociology</i> 72(4), 2007, pp. 583-607.</p>	<p>Men and women access different social networks with women having bonded/relational resources that will only bring economic returns when bridged/linked to men's networks</p>	<p>Focus on gender</p> <p>Networks important</p>

APPENDIX E : ACRONYMS

ADLI	Agricultural Development-led Industrialization
AEZ	Agro-ecological zone
AGRA	Alliance for a Green Revolution in Africa
ASE	Agri-service Ethiopia
ATMA	Agricultural Technology Management Agency
ATVET	Agricultural Technical and Vocational Education and Training
BMGF	Bill & Melinda Gates Foundation
BOARD	Bureau of Agriculture and Rural Development
BPR	Business Process Reengineering
CIPP	Comprehensive Integrated Package Projects
CADU	Chilalo Agriculture Development Unit
DA	Development agent
ECX	Ethiopian commodity exchange
EDRI	Ethiopian Development Research Institute
EEA	Ethiopian Economic Association
EEPRI	Ethiopian Economic Policy Research Institute
EIAR	Ethiopian Institute of Agricultural Research
ESE	Ethiopian Seed Enterprise
FFS	Farmer field school
FRG	Farmer research group
FSCB	Food Security Coordination Bureau
REG	Farmer research extension group
FTC	Farmer training center

FTC-MC	Farmer training center management committee
GDP	Gross domestic product
GOE	Government of Ethiopia
HV	High value
HVC	High value crop
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)
IWMI	International Water Management Institute
JICA	Japan International Cooperation Agency
MFI	Micro-finance institution
MOARD	Ministry of Agriculture and Rural Development
MOE	Ministry of Education
NAIEP	National Extension Intervention Program
NGO	Non-government organization
NRM	Natural resource management
OOARD	Office of Agriculture and Rural Development
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PPP	Public-private partnership
RCBP	Rural Capacity Building Program
SG-2000	Sasakawa Global 2000
SMS	Subject matter specialist
SSA	Sub-Saharan Africa
T&V	Training and Visit

TVET	Technical Vocational and Educational Training
WAC	Woreda Advisory Committee
WADU	Wolayita Agriculture Development Unit
WELC	Woreda extension linkage center

APPENDIX F: DESK REVIEW FINDINGS

The desk review for this study reviewed at least 30 empirical studies and issued papers on agricultural extension and education in Ethiopia. Below we will discuss the major findings from past reviews of Ethiopian extension. These can be broken down into approaches taken by the Government of Ethiopia relating to extension; systems, management, and linkages; infrastructure and resources; knowledge and capabilities; and the enabling environment.

Approaches by the government on extension

Extension in Ethiopia has gone through radical policy shifts in the past 50 years, from feudalism to Marxism to a free market system (Kassa 2005). Currently, extension is mostly provided by the public sector, operating in a decentralized manner where extension is implemented at the *woreda* (district) level. Limited extension is conducted by NGOs and the private sector, usually working through the *woreda*-level BOARDS.

While commercialization of agriculture is seen by the government as a focal point for agricultural development (Gebre-ab 2006), this market orientation does not show up in action (Gebremedhin et al. 2006). Instead, the government approach is very food-security-oriented rather than market-oriented.

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 2006; Gebremedhin et al. 2006; Kassa and Abebaw 2004; Kassa 2002; Kelemework 2007). The emphasis in extension on production, technology, and food security is also seen by the fact that DAs are still being trained under the three areas of crops, livestock, or NRM, rather than marketing or commercial agriculture. For the main part, extension tends to focus on crops, especially cereals, and to leave out cash crops, NRM, and livestock (EEA 2006; Kassa 2002). It does so using a production-oriented package approach (Gebremedhin et al. 2006). The Ethiopian PADETES approach offers three main extension packages, which are formulated at the federal level: household, regular, and minimum.

In extension programs, there is little attention to gender, culture, youth, HIV/AIDS, agro-ecosystem variance, or local demands (Ashworth 2005; EEA 2006). While there has been gender training and mainstreaming in some Bureaus

of Agriculture, women are not involved in extension, 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 promotion of modern packages, which tend to be preferred by extension and research (Efa et al. 2006).

There is a need to fit extension approaches to various agro-ecological zones (Abate 2007; Lemma and Hoffman 2005); however, most packages are formulated at the federal level (EEA 2006). Irrigation extension is also neglected in the approach (Aberra and Teshome 2009). There is a great need for a strategic vision of the future of extension (Ashworth 2005).

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, while becoming increasingly important, are often left out of extension initiatives, or cooperation is weak (EEA 2006; Spielman et al. 2007). However, NGOs in particular have many innovative and participatory approaches (FAO 2008a, b).

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 Ministry of Agriculture and Rural Development, most research activities come under the EIAR. While EIAR attempts to address this through research-extension coordinators or a department focused on coordinating research and extension, frequent reshuffling and changes within departments does not allow this to work.

Knowledge and capabilities

Capacity is a major issue within the extension system; many DAs and experts have low capacity and morale. The DA position suffers from high turnover (Gebremedhin et al. 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 of Ethiopia) (Kassa 2004a). At the training institutes, there are also the problems of brain drain, 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 such as the ATVETs are conventionally viewed as a means for building human and scientific capital, but it is also important to recognize that this training also has a vital role in building capacity of organizations and individuals to transmit and adapt 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 et al. 2008).

DAs and other extension staff appear to have limited skills for 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, men and women 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 men and women 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 mindset 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 is the use of DAs for non-extension activities (EEA 2006; Kassa 2002). This includes the distribution of fertilizer, collection of credit and taxes, and other government activities that do not typically fall under the mandate of extension.

While 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 development agents rather than the quantity.

Infrastructure and resources

Scholars agree that the FTC should be the focal point for all of the actors within the innovation system (Abate 2007). However, the FTCs need monitoring and support (Aberra and Teshome 2009).

Because FTCs are relatively new, not much has appeared in the literature as of yet. This also goes for the ATVETs, which began training DAs only about five years ago, and thus there is not much information as to how the ATVETs operate.

Enabling environment

Extension must be backed up by enabling policies (FAO 2008 a, b). However, these are often formulated and implemented without due regard to farmers' opinions (Kassa 2002). Policies and programs are needed that go beyond technological to institutional innovation, and strengthen innovative capabilities of government agricultural staff and farmers (Spielman 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, or business and investment, are needed to provide incentives that 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 monopolies in the transport system (EEA 2006). Many of the constraints to adoption are due 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, lack of inputs, late delivery of inputs, weak seed systems, transportation problems with the input system, monopolies on input markets, and lack of communication and information sharing within the extension line departments from federal to *kebele* level. Extension at times has also overly focused on production, leaving out critical sectors like marketing, to the detriment of small-

scale maize farmers who experienced a price collapse in 2001/02 as a result of overproduction. Linkages are poor between research and extension and within the extension line ministries from the federal to the *kebele* levels.

However, there are some positive steps taking place. One is the use of information and communication technology (ICT) in agriculture, and setting up of marketing and credit institutions. Another innovation is the institution of the Ethiopian Commodity Exchange (ECX) in 2008 (FAO 2008a, b). The ECX is a completely electronic system that markets cereals, coffee, sesame, and other crops.

PADETES reviews

There have been several reviews of the PADETES system. The major one, conducted by the EEA/EEPRI, evaluated PADETES in 2005 (EEA 2006). According to their results, 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 also showed the following:

- 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 resulted in a total number of 4.2 million participants from a total of about 10 million small-scale farmers in the country (Kelemework and Kassa 2006).

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

Appendix G- Adama workshop attendees

Name	Position	Affiliation
Dr Aberra Deressa	State Minister	MOARD
H. E. Ato Gobena Abate		Parliament
Abdo Adem		Parliament
H.E. Ato Aleleigne Fantaye		Parliament
H.E. Ato Getachew Tselo		Parliament
H.E. Ato Kebede Olbemo		Parliament
H.E. Ato Daniel Hailemariam		Parliament
H.E. Ato Kifle Hailemariam		Parliament
H.E. Ato Merkeneh Moltarie		Parliament
H.E Ato Rihana Aman		Parliament
Ato Berhanu W/Michael	Head, Food Security	MOARD
W/ro Zertehun Seyoum	Head, Gender	MOARD
Ato Tarekegn Tsige	Head, Public Relations	MOARD
Ato Illu Alemeyehu	Expert	MOARD
Ato Alemu Eibsa	Regional Extension Head	Afar
Ato Ibrahim Mohamed	Woreda head	Afar
Mr. Abubakar Mohammed	Research-Afar	Afar
Mr. Negussie Gorfu	Expert-livestock/pastoral	Afar
Ato Alemu Admassu	Regional Extension Head	Amhara
Ato Abebaw Tadele	Development Agent	Amhara
Ato Alemayehu Sewenet	Development Agent	Amhara
Ato Fekadu Tafer	Development Agent	Amhara
Ato Belstie Tiruneh	Head, Dejen Woreda	Amhara
Mesfin Astateke	Expert- cooperatives?	Amhara
Ato Kindu Amera	Development Agent	Benishangul-Gumuz

Name	Position	Affiliation
Ato Yirga Ayele	Woreda head	Benishangul-Gumuz
Abdulhatiz Bedru	Acting Head	Benishangul-Gumuz (Assosa ATVET)
Ato Abduselam Ahmed	Bureau Head	Dire Dawa
Ato Ahmed Mohamed	Planning	Dire Dawa
Dr. Seyoum Bedeyie	Livestock Res. Process Dir.	EIAR
Ato Ibrahim Mohammed	Linkage Head	Federal
Gezahegn Tadesse	Livestock head	Federal
Elias Awol	NRM Head	Federal
Ato Tsegaw Seyoum	Extension Expert	Federal
Ato Gatwich Gatluak		Gambella
Ato David Uduru	Extension Dept. Head	Gambella
Ato Teklu Tesfaye	ATVET Head	Gambella ATVET
Chan Lam	Development Agent	Gambella
Ato Sileshi Jebessa	Bureau Head	Harari
Ato Abebe Diriba	Regional Extension Head	Oromia
Dr. Assefa Taa	Regional Head, Research	Oromia
Ato Deyfella bin Hussien	Development Agent	Oromia
Ato Robe Hailu	Development Agent	Oromia
Ms. Shitaye Dechu	Development Agent	Oromia
Ato Hussen Mohammed Abubaker	Development Agent	Oromia
Ato Taha Mume	Research- Oromia	Oromia
Ato Mesegana Lelisa	Expert-crops	Oromia
Ato Derebe Deboch	Development Agent	SNNP
Ato Alazar Yacob	Development Agent	SNNP
Ato Assefa Becharie	Development Agent	SNNP
Ato Nurdin Mohamed	Woreda head	SNNP
Dr. Daniel Dauro	Regional Head, Research	SNNP

Name	Position	Affiliation
Ato Fetene Abeba	ATVET Head	SNNP (Dilla ATVET)
Ato Simachew Chekol	Expert	SNNP BOARD
Abdi Salin Ahemed Rep Ato Isse Abdi	Development Agent	Somali
Ato Muhadin Mohamed	ATVET Head	Somali (Gode ATVET)
Omar Abdi	Extension Head	Somali Livestock Crop & Rural Dev. Bureau
Wzo. Selamawit Taddelle	Development Agent	Tigray
Ato Mekonnen Teferi	Woreda head	Tigray
Ms. Alemnesh Hadgu	Expert-NRM	Tigray
Ato AleMBERHAN Harifeyo	Development Agent	Tigray (Atsibi Woreda)
Ato Feseha Bezabeh	Extension Head	Tigray BOARD

APPENDIX H: Stakeholder and expert input detail

Note to the reader: As mentioned in the full text of the report, stakeholders and experts on Ethiopian extension played a critical role in identifying key constraints that face the extension system and developing the overall set of recommendations. Interim drafts of this report were also reviewed in detail by stakeholders and experts. This appendix section captures some of the main themes that were brought up in stakeholder meetings and were subsequently incorporated into the overall report findings and recommendations.

LINKAGES AND ENABLING ENVIRONMENT

- 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.
- Overall enabling environment is one of the most critical issues- extension does not operate in a vacuum. Seed system and markets are huge constraints right now- without fixing these, the extension system will remain unable to meet the needs of farmers. We should look at the overall enabling environment and how it might strengthen linkages.
- We need to draw out ways to enhance the roles of other players, such as farmer organizations and the private sector

SUSTAINABILITY

- The report should 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.
- Be clear if we are trying to strengthen what is existing, or proposing something different for the extension system.
- Give some indication of how to prioritize recommendation areas.
- Income generation and learning do not have any conflict; they go together. There should be different departments: fattening, irrigation, poultry etc.

APPROACH & METHODS

- The report should not continue the tradition of focusing only on crop extension, leaving out livestock, non-cereal crops, irrigation, women farmers, and pastoralists.
- We should 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.
- We cannot neglect productivity issues completely for market orientation in extension
- Diversification is critical

FIELD EXTENSION SYSTEM AND TRAINING

- The “woreda resource center” is a good idea but should be called “woreda information or knowledge center.” We need more resources at kebele level too.
- DAs should be generalists, but there should be a mechanism for calling specialist SMSs or allowing for short-term training for specialization. But in terms of transferring knowledge you should specialize on some skills.
- FTCs are backbone of agricultural development and should be developed more for training

STAFF PERFORMANCE

- The culture of performance and accountability needs to be improved at all levels of extension, not just FTCs
- Need more focus on quality of ATVET students and instructors
- Need to improve communication of DAs
- Measurement criteria should be taken from impact of DA—farmers should participate in measuring the DAs- they should be satisfied with service
- DAs should be transferrable/promotable to the woreda, zone, and even regional level
- Best incentive staff is education-this should be shortened

GENERALIST VS SPECIALIST DA ROLE

- Stakeholder meetings had much dialogue on DA as generalist versus specialist. Adama meeting participants were nearly unanimous in calling for generalist DAs
- Most DAs required to answer broad array of questions from farmers, not just in their specialist areas; DAs in the field today need remedial or in-service training courses on other topics, based on the needs of farmers