Agricultural Extension Strategy of Ethiopia

Ethiopian ATA
Agricultural Transformation Agency
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Agricultural Extension Strategy of Ethiopia

Ministry of Agriculture and Natural Resources

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Executive Summary

Introduction

The Government of Ethiopia is highly committed to sustainably increasing agricultural production to meet the growing demand for food, industrial raw materials, and foreign currency earnings. In order to respond the growing demand of different stakeholders, there is a need of dynamic and proactive extension system. Rigorous and vibrant extension system is a key policy instrument for necessary behavioral and attitudinal changes and creating demands on national agricultural extension programs. Development experts as crucial in achieving agricultural development, poverty reduction, and food security have emphasized agricultural extension. By recognizing this, the government of Ethiopia has made great efforts to transform the agricultural sector mainly by strengthening its extension services as part of the general agriculture policy reform. In spite of considerable efforts made to improve the extension system of the country in the past, the system is not bringing the desired results. Thus, it is of paramount importance to prepare an extension strategy, which considers the demand for agricultural development and that shows the future direction of the extension services.

The agricultural extension system

Since research-based agricultural extension services started to be provided to the surrounding farming communities by the then Alemaya College of Agriculture (currently Haramaya University of Agriculture) in 1953, the country has implemented several agricultural extension systems at different times aimed at supporting rural communities. Under Ethiopia's current Agriculture Development-Led Industrialization (ADLI) strategy, the extension system remains a critical tool. The government of Ethiopia firmly believes that an effective and efficient extension system must play an important role to transform smallholder subsistence agriculture to commercial agricultural production system by facilitating adoption and utilization of yield- and quality-increasing agricultural technologies.

The extension system in Ethiopia has great potential to help farmers throughout the country. With approximately 21 development agents (DAs) per 10,000 farmers, and even more in the high-potential areas, Ethiopia has one of the densest agricultural extension systems in the world. The Ethiopian extension system uses FTCs-based agricultural extension approach, coupled with farmer groups such as one-in-five and development units, which are considered an entry point for the grass-roots extension services and for the bottom up extension approach. FTCs assisted by development agents and farmer groups are expected to give a wide range of agricultural extension services forward looking and sustainable farmer-owned agricultural extension system. Currently the government has established close to 12,500FTCs that are functioning at different levels. Also established were 25 ATVETs to produce development agents in different fields of specializations.

Ethiopia has also been implementing a participatory extension system (PES) since 2010 (MoA, 2010) following the commencement of the first Growth and Transformation Plan (GTP-I). The PES is a modified version of Participatory Demonstration and Training Extension System (PADETES).The major changes made in PES as compared to PADETS were organization of farmers in development groups and social networks. In addition, FTC categorization into watershed management and full-package extension service provision through improved participation.

A strategy for the extension system to reach its potential

Despite such efforts to make the extension system effective and efficient, the system is not producing the desired results. Many yield- and quality-improving technologies have been generated in the agricultural sector, but they are not reaching smallholder farmers. Equally, the agricultural sector is not reaching its full potential in terms of attaining food self-sufficiency and reducing poverty. The failure could be attributed, among others, to poor implementation and insufficient strategic interventions to overcome system-wide bottlenecks.

The development of this strategy – the first of its kind focusing on agricultural extension – is premised on a belief that an effective and efficient agricultural extension system can play a vital role to enhance the agricultural productivity and production of smallholders through the development of innovative, systematic, and dynamic agriculture extension services.

Vision, mission, and objective of the extension system

Vision for Ethiopia's extension strategy
Modern agriculture integrated with the rest of the economy and a wealthy society free from food insecurity and poverty.

Mission of Ethiopia's extension strategy
Create modern, effective, and efficient agricultural extension system through enhanced market-oriented, demand-driven, and pluralistic extension services to promote improved technologies, good practices, and methods, which enable the society to achieve food security and create wealth.

Goal of Ethiopia's extension strategy
Contribute significantly to the attainment of food and nutrition security, poverty reduction and wealth creation in the country through adoption and adaptation of improved technologies by delivering market-oriented, demand-driven, and pluralistic extension services.

Objective of Ethiopia's extension strategy
To transform Ethiopia's agriculture through the implementation of pluralistic extension system by providing demand-driven and market-oriented extension services to male, female and youth farmers, pastoralists and agro pastoralists.

This strategy document integrates best practices and innovations for effective delivery of extension services to smallholder farmers. At the same time, the strategy analyses the systemic bottlenecks that have hindered the system from operating more effectively. A series of complementary and strategic interventions are proposed which will enable the extension system to achieve its vision, mission, and objectives. Thestrategy will serve as an umbrella for all agricultural sectors including crops, livestock and fishery, natural resource management and other crosscutting issues.

Approach of strategy development

Thestrategy was developed based on consultative and iterative processes facilitated by Ministry of Agriculture & Natural Resource (MoANR) and the Ethiopian Agricultural Transformation Agency (ATA). The strategy benefitted from input by experts from the MoANR, Regional Bureaus of Agriculture, ATA, Oxfam America, SG 2000, SNV and Digital Green (DG) who have actively participated through the process ofstrategy development.

The process involved six, but interrelated steps. It started with a consultative workshop of the policy makers drawn from the Federal and regional governments. The policy makers provided a high-level direction and road map, which served as the basis for the development of the strategy document. This was followed by a consultative workshop of experts to developa clear vision for the long-term transformational extension strategy and development of a framework for assessing the practices. A field assessment in the four major regions was then conducted to learn more from successful extension examples that could guide the strategy development. A final synthesis workshop was held to develop the "pillars" of the strategy. Validation for approval of the strategy was held in the presence of key policy makers, extension professionals, scientists, model farmers (including women and youth), and practitioners from different organizations working in agriculture and rural development.

Key principles

The key principles identified for the guiding the development and implementation of the strategy documented its further implementation are (1) market-oriented and demand driven extension system; (2) government-led pluralistic extension service; (3) participatory and multiple extension methods and approaches;(4) value-chain and agricultural commercialization cluster extension approach; (5)gender, youth and nutrition mainstreaming;(6) mainstreaming of sustainable environmental practices;(7) location and agro-ecologies specific interventions; (8) Competent and skilled human resources; (9) specialization and diversification; (10) process and result oriented extension services;(11) inclusive extension services; (12) collaboration and harmonization with others complementary services;(13)scaling out and up of good practices;and (14) responsibility and accountability.

Pillars bottlenecks, and Priority interventions

The strategy has been built around nine pillars. During the synthesis workshops by experts, major systemic bottlenecks in each pillar were thoroughly analyzed and systemic interventions were proposed to be implemented over a long period based on set priorities.

Pillar 1: Strengthen FTCs through active participation of community and capacity building: The Ethiopian agricultural extension system is heavily dependent on Farmer Training Centers (FTCs) and trained DAs that give extension support to farmers. FTCs serve as an entry point for providing effective and efficient extension services. FTCs should also serve as hubs for knowledge and information sharing and centers for promoting best practices. At the same time, it is important to notice that FTCs are self-sustaining, to ensure both commercial viability and developing sense of community ownership. Successful FTCs should focus on developing modern farmers who are able to harness positive changes in farming technology while also being able to cope with changing conditions and stresses. To date 12,500 FTCs have been established across the country in which all of them are reported to befound at varying levels of functionality and currently most of them are not capable of providing the expected services to farmers.

The key bottlenecks leading to inadequate performance of FTCs include (1) limited involvement of farmers in FTC management; (2) insufficient resources for FTCs;(3) most FTCs have no long-term plans for sustainability; (4) inadequate incentives to motivate and retain DAs; (5) limited knowledge and skill of DAs;(6) limited training to farmers; and (7) inadequateincentives for model farmers for their time to support resource poor farmers. This strategy has developed eight corresponding systemic interventions to address these bottlenecks as illustrated in the main document.

Pillar 2: Enhanceagricultural knowledge and information services: Properly documenting and managing knowledge and information enable to reach smallholder farmers and other practitioners in a timely manner and this consequently increase agricultural production, productivity, and addressing food insecurity.Successful agricultural knowledge and information management requires strong institutions, infrastructure, facilities, and skilled human resources to generate, capture, store and disseminate tailored made services to all farming communities.

Systemic bottlenecks that undermine effectiveness of agricultural knowledge management are (1) poor utilization of ICT-based extension services; (2) limited access to improve agricultural knowledge, information and technologies;(3) limited agricultural knowledge and information for urban and peri-urban communities;(4)inadequate consideration to farmers needs and priorities in research agenda setting and extension package development;and (5); limited access to knowledge and information on agricultural risk management. This strategy has developed seven systemic interventions to address the identified bottlenecks.

Pillar 3:Enhance client oriented and multi actor's advisory extension services: An effective agricultural extension system needs to use a broad range of actors to provide inclusive,market-oriented and demand driven extension services to improve the livelihoods of different social categories of smallholders (male, female and youth) that requires specific technical domains and innovative solutions to optimumbenefits for farmers. Services provided under the current extension system often fail to be sufficiently diverse, client-oriented, or market-oriented, although these are currently showing some improvements.

The systemic bottlenecks to tailoring farmer-oriented service delivery include (1) limited involvement of stakeholders in providing extension services; (2) low cooperation and collaboration between public and NGOs in extension services;(3) insufficient involvement of cooperatives and other private sectors /agro-processing companies/ in extension services. This strategy has developed four systemic interventions to address the bottlenecks.

Pillar 4: Facilitate market linkage and enhance value chains development: Current extension services typically focus on promotion of improved technologies and good agricultural practices to increase production and productivity of farmers without giving due consideration to value addition and

marketing. However, increasing production does not necessarily reward farmers with better income unless it is embedded in a holistic value chainapproaches.

The effort to link farmers to markets in Ethiopia through effective value chain development meets several bottlenecks that need to be urgently addressed. The main holdups are (1) insufficient understanding of market-oriented production system; (2) limited focus on strategic commodities in the extension services; (3) limited knowledge and skills of extension staff to facilitate value chain development; (4) Ineffective linkage among value chain actors;and (5) limited access to market information and collective marketing. This strategy has developed systemic interventions to address the bottlenecks.

Pillar 5: Gender, youth, and nutrition mainstreaming:Women in Ethiopia contribute up to 40-60% of labor in the production process. However, women face specific constraints that reduce their productivity and limit their contributions to agricultural production and productivity. It is reported that on average, female farmers produce 23% less per hectare than their male counterparts just because of the inability of women to access the necessary agricultural inputs and services. This negatively affects productivity, efficiency, effectiveness, and overall economic progress of the country.

This strategy recognizes the importance of gender youth and nutrition mainstreaming as a key approach to ensure equality between women and men, and through increased agricultural production, productivity, leading to the wellbeing of women and youth farmers. The four main bottlenecks that affect gender youth and nutrition mainstreaming are (1) poor gender and youth mainstreaming in extension programs planning, implementation and in monitoring, learning and evaluation;(2) shortage of gender disaggregated data;(3)Socio-cultural constraints; and (4) inadequate nutrition sensitive extension service. This strategy has developed sevensystemic interventions to address these issues.

Pillar 6: Enhance environmentally sustainable agricultural practices: Appropriate management of natural resources (land, soil, water, and environment) is a powerful influence on environmental quality and sustainability and can lead to increased long-termagricultural production and productivity.Therefore, the extension system needs to introduce appropriate natural resources in order to avert environmental degradation.

In this sub-section, four extension-related bottlenecks that affect resource management have been identified. These are (1)poor linkage between natural resources management and livelihood strategies;(2) limited capacity on environment and natural resource management; (3) low access to and use of climate smart agricultural technologies and agro-metrological information;and (4)less attention to environment sustainability in the extension advisory service. This strategy has developed four systemic interventions to address these bottlenecks.

Pillar 7: Enhance institutional arrangements, coordination, and linkages among key agricultural development partners: Addressing diverse and complex problems of agriculture require the coordinated efforts of individuals, groups, institutions, and organizations at various levels. Taking this principle into consideration, the government of Ethiopia established Agricultural Development Partners' Linkage Advisory Council (ADPLAC) in 2008 to enhance linkage and coordination among potential partners engaged in agricultural extension, research, and development at different levels, from the Federal to the Woreda levels. Since its formation, ADPLAC has helped to bring together various actors by building new collaborations, encouraging a culture of working together, enhancing a demand-driven agricultural research system for more impact and by helping shift the research agenda towards farmers' needs through joint identification of problems and development of innovations to solve them.

While ADPLAC has been successful in some areas, largely it has failed to achieve its overarching mission of effectively linking actors in the research and extension sectors. This strategy identified three bottlenecks affecting smooth implementation of ADAPLAC (1) lack of vibrant linkage and alignments;(2) weak coordination and communication between agricultural sectors and HLIs/ATVETs; and (3) inability to take responsibility and accountability in linkage platforms.This strategy has developed two systemic interventions to address the bottlenecks.

Pillar 8: Human resource development and utilization for effective extension service delivery: One of the major challenges in the agricultural sector is lack of effective human resource development system. As a result, there is limited competent, well trained, and highly calibrated extension staff at all levels. The human resource capacity development will need to pursue the complex and dynamic agricultural development demands.

The provision of decentralized and participatory extension service requires having adequate, experienced, and qualified staff at all levels to improve the quality of the extension service in the future. During the field visit, critical shortage of qualified work force at various levels is reported to be a serious problem in agricultural extension services. Moreover, the situation is exacerbated by low staff motivation that contributed to high staff turnover. Quality service delivery should not be expected in the absence of adequate and qualified staff. Therefore, there is a need to consider the issues related to human resource development and its utilization as one of the key element in the extension service.The three main bottlenecks related to human resource development and its effective utilization arelimited demand based training at HLIs and ATVET;poor staffing and high staff turnover; and lack of clear chain of command. This strategy has developed three corresponding systemic interventions to address the bottlenecks.

Pillar 9: Establish strong and dynamic result-based monitoring, evaluation, and learning (RB-MLE) for continuous improvement of extension services delivery: Monitoring, learning and evaluation (MLE) is a key tool to identify constraints, assess the progress, and generate relevant and timely information to make informed decisions. Decisions are changed into actions when they are based on facts and realities on the ground. Currently, efforts are being underway to put in place MLE by different organizations. However, such consideration to strengthen MLE at region and Woreda levels is missing. The following bottlenecks prevent the MLE unit/case team of the ministry from functioning effectively.

The existence of weak monitoring, learning and evaluation system;and weak accountability and responsibility system are identified as a measure bottleneck. This strategy has developed two systemic interventions to address the identified bottleneck.

Implementation Framework

Addressing the bottlenecks and ensuring the implementation of the strategic intervention swillrequire a coordinatedeffort of all organizations and individuals engaged in agricultural development. This document has identified the key actors at all levels and suggested their roles and responsibilities.

Since not all interventions can be simultaneously implemented, a phased approach for implementing interventions has been designed. In this phased approach, pillars and interventions that can serve as input for the achievement of other pillars have been prioritized. Prioritization and sequencing of interventions will be further refined based on the responsibility of each organization within their existing settings.

Acronyms and abbreviations

ACCs	Agriculture Commercialization Clusters
ADLI	Agriculture Development Led Industrialization
ADPLAC	Agriculture Development Partners Linkage Advisory Council
AGP	Agricultural Growth Program
AI	Artificial Insemination
ARM	Agricultural Risk Management
ATA	Agricultural Transformation Agency
ATVET	Agricultural Technical and Vocational Education and Training
BBM	Broad Bed Maker
BMGF	Bill & Melinda Gates Foundation
CA	Conservation Agriculture
CAADP	Comprehensive African Agricultural Development Program
CCA	Climate Change Adaptation
CIGs	Common Interest Groups
DAs	Development Agents
DG	Digital Green
DRM	Disaster Risk Management
EAAPP	East African Agriculture and Production Project
ECX	Ethiopian Commodity Exchange
EIAR	Ethiopian Institute for Agricultural Research
FBOs	Farmers Based Organizations
FFS	Farmers Field School
F/PTCs	Farmers/Pastoralists Training Centers
FP	Focal Person
FREG	Farmers Research Extension Group
GDP	Growth Domestic Product
GIZ	German Development Cooperation
GoE	Government of Ethiopia
GOs	Government Organizations
HABP	Household Asset Building Program
HLIs	Higher Learning Institutions
ICT	Information and Communication Technology
IFPRI	International Food Policy Research Institute
IVR	Interactive Voice Response
MC	Management Committee
MLE	Monitoring, Learning and Evaluation
MoA	Ministry of Agriculture
MoANR	Ministry of Agriculture and Natural Resources
MoLFD	Ministry of Livestock and Fisheries Development
NGOs	Non-governmental Organizations
NRM	Natural Resources Management
OA	Oxfam America
PADETES	Participatory Demonstration and Training Extension System
PES	Participatory Extension System
PICO	People, Innovation and Change in Organization
PMAs	Producer Marketing Associations
R-BoAN	Regional Bureau of Agriculture and Natural Resource
R-BoLFD	Regional Bureau of Livestock & Fishery
RELC	Research&Extension Liaison Committee

REFAC	Research Extension Farmers Advisory Council
SG2000	Sasakawa Global 2000
SLM	Sustainable Land Management
SNNPR	Southern Nations, Nationalities, and Peoples Region
SNV	Netherlands Development Organization
TASD	Training and Advisory Service Directorate
UNDP	United Nations Development Program
VCD	Value Chain Development
VLDP	Village Level Development Promoter
WoANRDO	Woreda Agricultural Natural Resource Development Office
WoLFDO	Woreda Livestock and Fishery Development Office
IWUA	Irrigation Water User Association

A Note from the Minister

Agriculture is one of the pillars of the Ethiopian economy and the overall economic growth of the country is highly dependent on the success of the agriculture sector. The Government of Ethiopia has demonstrated strong commitment to agriculture and rural development through the allocation of over 10% of the national budget to deliver enhanced production technologies and support services.

Within the framework of the Agricultural Development-Led Industrialization (ADLI) strategy, the Government of Ethiopia has made huge efforts to transform the agriculture sector. The Government promoted and supported the public extension service as key instrument to meet the agricultural sector development objectives, including 30% women and 10% youth participation. The Government established Agricultural Technical and Vocational Education and Training (ATVET) Colleges and Farmer Training Centers (FTC) as critical knowledge institutions supporting the transformation of the agricultural sector. FTCs play a critical role in technology transfer, farmer training in modern production management and methods and provision of agricultural extension advisory services. We envisage FTCs to be major transformational institutions that will enable rural commercialization and industrialization to spur. The linkage between agriculture and industry will be driven by the training of young female and male farmers who would take up entrepreneurial opportunities to engage in agriculture as a businesssuch as producers, agro-processers, and marketers.

The market-oriented agricultural development policy will only be successfully implemented if our extension system is strengthened to respond to the emerging needs of the market. It is time for our extension system to supplement its focus on market production. This requires shifts in mind-set and skills. Development agents are not only transferring technologies but also are required to facilitate linkages along the value chains and need to have a broader set of skills than previously was needed.

This strategy document brings in futuristic outlook for the extension system and will guide all stakeholders involved in agricultural extension service to define short- and long-term objectives, identify tasks and milestones, and outline a plan of action to accomplish specific tasks within an established schedule. The development of this strategy has required the collective efforts of multiple stakeholders from the public and development partners.

On behalf of the Government of Ethiopia, I would like to thank all stakeholders who were involved in the development of the strategy document and encourage these and other stakeholders to show a similar effort in the implementation of the intervention areas contained in the strategy.

I strongly believe that together we will continue to create a highly effective extension system that fulfills the promise of sustainably improving the livelihoods of smallholder farmers while contributing to Ethiopia's overall vision of achieving middle income status by 2025.

I also strongly appreciate the technical and financial effort made by those key stakeholders contribution to the success of the preparation and finalization of this document.

EyasuAbreha(PhD)
Minister, Ministry of Agriculture and Natural Resources

Section 1: Introduction

1.1. Background

Subsistence agriculture has continuously dominated economic development policy in Ethiopia (Mellor, 2014). This sector contributed about 39% of the country's Gross Domestic Product (GDP) by end of 2014/15. Crop and livestock subsectors accounted for 27.4% and 7.9% respectively, while the residual was accounted for by forestry and fishing (NPC, 2016). Despite its pivotal role, the performance of this sector has remained largely unsatisfactory (Gregory, 2013). The sector is characterized by subsistence oriented, low input and output. In addition, over 90% of cultivated land has been dependent on rain-fed, making the sector highly susceptible to climate change (ATA, 2016).

The Government of the Federal Democratic Republic of Ethiopia (FDRE) formulated agricultural policy and strategies, the Agriculture Development Led Industrialization (ADLI), to overcome the agricultural problems and transform the country's economy. Based on implementation of the agricultural policy, growth in agricultural production and productivity has been registered in the economy. Real GDP grew by 10.3% in 2013/14, with 2.3% of this growth from the agricultural sector. As of 2014, 72.7% of employment was generated by the agriculture sector (UNDP, 2015).

ADLI has served as an umbrella strategy guiding the three most recent five year national plans: the Sustainable Development and Poverty Reduction Program (SDPRP), 2002/03-2004/05; a Plan for Accelerated and Sustained Development to End Poverty (PASDEP), 2005/06-2009/10; and the Growth and Transformation Plan-I (GTP-I), 2010-2015. In general, Ethiopia's rural development policy and strategies prioritize the transformation of smallholder subsistence agriculture to commercial agriculture through market-orientated production system. Accordingly, the government is investing heavily in agriculture with a focus on public extension services by deploying considerable human and financial resources.

GTP-I mainly focused on accelerated growth in agricultural productivity for ensuring food security and supporting the food industry through increasing crop production, enhancing crop productivity by applying good agricultural practices, and improving extension services. Moreover, it emphasized on the utilization and agricultural inputs, strengthening agricultural marketing system, enhancing agricultural research and strengthening natural resource conservation. During the period of GTP-I, the number of agricultural extension beneficiaries has increased from 5.1 million in 2009/10 to 13.95 million farmers by the end of 2014/15. Although the number of beneficiaries from the agricultural extension system has increased, its effectiveness in terms of better outcome as measured by increased productivity gains needs to be enhanced (NPC, 2016).

The current Growth and Transformation Plan-II (GTP-II) 2015-2020 builds on the achievements and lessons learnt during the implementation of GTP-I. Though accelerated growth in agricultural productivity continues to be an important area of focus as food security continues to be a challenge, it is envisaged to shift towards high value crops reinforced by a market system that will benefit farmers (NPC, 2016).

One of the major objectives of the ADLI strategy as reflected in the GTPs is transforming the agricultural sector to ensure food security and self-sufficiency in food production. Both GTPs emphasize food security as a national goal. Nevertheless, whereas GTP-I focused on traditional crops, GTP-II shifts to high value crops, includes market development more specifically, highlights implementation capacities and looks at food and nutrition in a more systematic way (NPC, 2016).

As laid out in its second Growth and Transformation Plan (GTP-II), the Government of Ethiopia is highly committed to sustainably increasing agricultural production by more than 8% per annum to meet the growing demand for food, industrial raw materials, and foreign currency earnings. In order to respond the growing demand of different stakeholders, there is a need of dynamic and proactive extension system.

Rigorous and vibrant extension system is a key policy instrument to enhance agricultural development. Development experts as crucial in achieving agricultural development, poverty reduction, and food security (Feder, et al., 2011) have emphasized agricultural extension. Dercon et al. (2007) show that receiving at least one extensions visit per year reduces the likelihood of being poor by 10% in Ethiopia. By recognizing this, the government of Ethiopia has made great efforts to transform the agricultural sector mainly by strengthening its

extension services as part of the general agriculture policy reform. In spite of considerable efforts made to improve the extension system of the country in the past, the system is not bringing the desired results.

Thus, it is of paramount importance to prepare a full-fledged extension strategy, which considers the growing demand of agricultural development in line with the future direction of the extension services.

1.2. Purpose and scope of the strategy document

The purpose of this strategy is to develop a strong market-oriented, demand-driven, and well-functioning agricultural extension system to transform the subsistence agricultural production to a commercialization. The strategy identifies the key bottlenecks to transforming agricultural production and proposes a series of systems level interventions to address the bottlenecks. The scope of this strategy ranges from agricultural inputs supplies to consumers in a value-chain and integrated extensionapproach.

While the strategy is long-term envisages implementation periods of 5 years as short-term (coinciding with GTP-2) and additionally a long-term; i.e., a ten-year during which the interventions may be further refined based on lessons learned and continuous farmer feedback.

1.3. Approach followed for the development of the extension strategy

The strategy was developed based on a consultative and iterative processes facilitated by MoANR and ATA. As shown in Figure 1, the process involved six, but interrelated steps. It started with a consultative workshop of the policy makers drawn from Federal and regional governments. The policy makers gave directions, which served as a basis for the development of the strategy document. Each step ensured the participation of relevant actors that included professionals in agricultural extension and research from Federaland regions, relevant NGOs, private actors and practitioners.

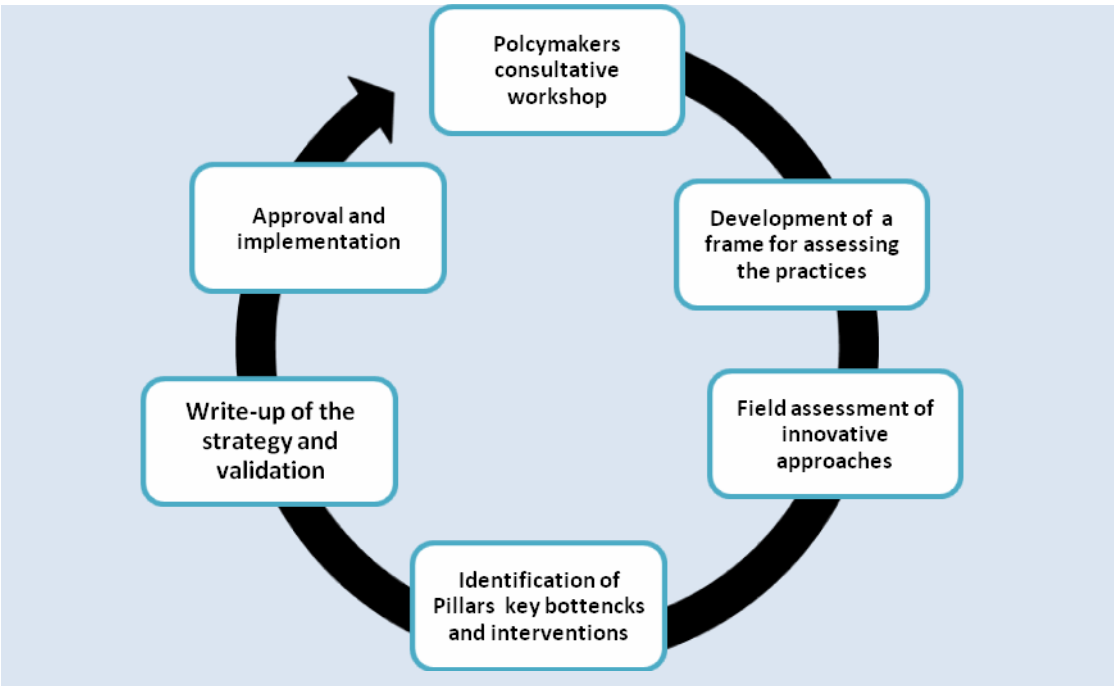

Figure 1: Steps for the preparation of the Extension Strategy

1.3.1. Policymakers' consultative workshop and directions given

The initial step for the preparation of the strategy document wasa policy makers' workshop held in December 2013, with the main objectivesof: (1) identifying emerging needs and policy directions for Ethiopia's extension system;(2) identifying strategic priorities and providing policy context for overhauling the extension system; and, (3) agreeing ona roadmap and overall approach to developing the strategy.

The Federal and Regional policy makers who participated in the workshop identified core thematic areas and provided a clear direction for the preparation of the strategy document. The core themes agreed upon for the strategy preparation were:

- FTC and smallholder centered interventions;
- Build and strengthen existing extension system;
- Pluralistic extension service with government ownership and leading role;
- Decentralized within the Federal system; and
- Market-oriented, demand-driven, gender-based, nutrition-sensitive, and environment-friendly agricultural development

1.3.2. Experts' Workshop

Based on these policy directions, a consultative workshop was held in March 2014 with the participation of experts in agricultural extension and research. At the workshop, a clear vision for a long-term transformational extension strategy was developed. As an entry point, conducting field assessments to learn more from successful stories (best practices,approaches, and innovations)from within the country was recommended by the experts.

1.3.3. Field assessment of innovative approaches and good practices

Experts drawn from theFederal and Regional Agriculture Offices, ATA, Oxfam America, SG-2000 and Netherlands Development Organization (SNV) and Digital Green (DG) deployed to the field in three groups to assess successful stories and best practices in thefour majorregions (Amhara, Oromia, SNNPR, and Tigray).A total of 17 good practices and approaches were identified.Lessons learned from these best practices were used in developing this strategy.

1.3.4. Synthesis workshop

The synthesis workshop was held in June 2014 with the dual purpose of sharing the lessons from the field assessments, identifying the key pillars, systemic bottlenecks and their interventions for the strategy development. In addition, during the workshop critical challenges, strategic/innovative approaches and relevant case studies from the field assessment for each pillar were identified. As benchmark, international best practices were also incorporated.

1.3.5. Preparation of the strategy document

A team of eight experts from organizations mentionedunder 1.3.3developedthe draft strategy starting from August 2014, following the policy directions and the agreed-uponmajor pillars. A stakeholder validation workshop was held to obtain further feedback to refine and enrich the document. The final strategy document was produced and submitted to policy makers for approval and implementation. This strategy document should be considered organic in that it will be refined on a regular basis as lessons are drawn from ongoing implementation and circumstances change.

1.4. Overview of agricultural extension and its evolution in Ethiopia

The birth of an agricultural extension service in Ethiopia dates back to 1953 when the then Alemaya Imperial College of Agriculture and Mechanical Arts, now Haramaya University started to provide research-based extension services to the surrounding communities based on the agreement made between the Ethiopian and US governments, following the Land Grant University approach. Since then, the country has implemented different types of agricultural extension systems, for instance, College System of Agricultural Extension Program (1953 to 1960s), Comprehensive PackageProject (1960-1970s), the Minimum Package Project (1970-1980s), Peasant Agricultural Development Project and Farming System Research Project (1985-1990s). Major challenges during these periods included instability of the extension system, unsustainability of the extension programs and projects such as WADU, CADU, EPID, and MPP;lack of common perceptions between technology generators and extension personnel; inadequate representation and participation of farmers; inadequatetrained manpower, limited finances; andone way communication and insufficient or even absence of monitoring and evaluation.

Over the years, a number of reforms have been taken place to address gaps in the various systems adopted leading to the current system. In 1993, SG-2000 started to demonstrate agricultural technologies as a pilot on major cereal crops. The demonstration conducted by SG-2000 clearly showed great successes and captured the attention of top-level officials and development practitioners, encouraging them toreplicate the experience of SG-2000 nationwide. The approach was later used as a basis for the current extension package services. In line with this, in 1995, the Government designed and implemented a Participatory Demonstration and Training Extension System (PADETES) as the core element of the extension system of the country. Its main objective was to improve participation of smallholder farmers and demonstrate improved agricultural technologies for improving productivity, incomes, and livelihoods of the rural community.

Thegovernment established and operationalized25 ATVETs in different parts of the country to produce skilled development agents (DAs),decided to establish a Farmer Training Centre (FTC) in each Kebele and deployedthree DAswith specializations in crops, livestock and natural resources to eachFTC.To-date over 83,000 DAs have been trained and graduated, of whom about 56, 000 DAs are working in agricultural extension (MoANR, 2017 and CSA, 2017).

More than a decade has now passed since FTC-based agricultural extension system was introduced. FTCs have been established to serve as centers for information and knowledge sharing, training and demonstration of technologies and innovation close to farmers' residents. Currently the government has established 12,500 FTCs and will construct the rest to meet the national target of 18,000FTCs. These FTCs are one of the key instruments for delivery of extension servicesgoing forward and can serve as symbols for current successes that the country has achieved in agriculture.

The country has recently developed and deployed a Participatory Extension System (PES), a modified version of PADETES, although the approach is not yet fully implemented nationwide. PES was started in 2010, following the commencement of Growth and Transformation Plan (GTP-I), as a means of strengthening participatory extension services. The major changes made in the approach were organization of farmers into development groups and social networks (development groups with 25-30 members on average and one in five group consisting one model farmer as a leader and 5 farmers as followers).

To help improve the agricultural extension system of the country, the Bill and Melinda Gates Foundation (BMGF) supported a review of the Ethiopian agricultural extension program in partnership with the Government of Ethiopia in 2009 (IFPRI, 2009). The review identified the system's strengths and constraints with the aim of improving the system and identifying ways in which such improvements might be scaled up in the future. The SWOT analysis below is based on the results from that study and other assessments conducted by different organizations.

1.5. Strengths, weaknesses, opportunities and threats (SWOT) analysis of the current extension system

Strengths	***Weaknesses***
• Decentralized and well-structured extension system that can be an example for many African countries, • The establishment of ATVET colleges to produce middle level skilled manpower, • Robust workforce of development agents (21 per 10,000 farmers, higher than any other country's ratio), • Establishment of FTCs atkebele-level, allowing for greater access to extension, training and demonstration, • Increased number of agricultural universities for skilled manpower development, • Codified national extension approach, • Strong social networks through farmer-group formation and peer-to-peer learning, • Increased demands by farmers for improved technologies.	• Limited market orientation, • Limited consistency and quality of extension implementation, • Weak coordination and linkage among actors in research and extension system, • Limited logistics and facilities for frontline extension workers, • Short-term focused campaigns divert attention from overall and long-term extension system responsibilities, • Due focus on model farmers, • Poor extension services for pastoral community, urban and peri-urban areas, • Poor functioning of FTCs to provide demand based extension services, • Low motivation leading to high turnover of extension staff, mainly DAs, • Limited use of communication media and use of ICTs, • Limited technology multiplication centers such as for livestock, • Minimum involvement of the private sector (limited capacity and inadequate support by government), including cooperatives in extension service delivery, • Limited capacity in gender,nutrition, climate and environment mainstreaming and its application, • Lack of clear line of command for the extension management, particularly at Woreda and Kebele levels, • Limited communication & coordination between Federal and regional bureaus of agriculture (R-BoA), • Weak planning, monitoring, learning and evaluation and feedback systems, • Limited knowledge and skill of extension staff on improved communication and facilitation, market and value chain development, agricultural risk management in a holistic manner, connecting technological solutions with basic diversification and financial tools.

Opportunities	*Threats*
• Conducive policy and strategy for agriculture sector(ADLI) and high commitment of government to transform agriculture, • Emerging agro-processing industries for value chain development and to provide embedded extension services. • Existence and growth of farmer cooperatives and unions to provide extension services, • Existence of ATVETs to train extension agents in agriculture, • Increased focus on value chain development and marketing, • Existence of special initiatives such as Livelihoods Agricultural Growth Program (AGP), Livelihoods Program, and SLM, • High interest by donor and NGO's to support extension system and services, • The existence of reliable regional and international market opportunities for agricultural products, • Ongoing efforts to establish marketing information system (ECX) and information networking (MoA, ATA & EIAR), • Increased trained manpower in agriculture, as a result of increased tertiary-level education in agriculture.	• High turnover of experienced professionals in agricultural extension, • Price fluctuations on international markets for agricultural products, • Climate change and recurrent drought.

Section 2: Vision, Mission, Goal and Objective

2.1. Vision, Mission, Goal, and Objective

Vision: Modern agriculture integrated with the rest of the economy and a wealthy society free from food insecurity and poverty.

Mission: Create modern, effective and efficient agricultural extension system through enhanced market-oriented, demand-driven and pluralistic extension[1] services to promote improved technologies, good practices and methods which enable the society to achieve food security and create wealth.

Goal: Contribute significantly to the attainment of food and nutrition security, poverty reduction and wealth creation in the country through adoption and adaptation of improved technologies by delivering market-oriented, demand-driven and pluralistic extension services.

Objective: To transform Ethiopia's agriculture through the implementation of pluralistic extension system by providing demand-driven and market-oriented extension services to male, female and youth farmers, pastoralists and agro pastoralists.

Specific objectives

- Strengthen/establish Pastoralist, Agro-pastoralist &Farmers Training Centers (P/FTCs) with the major goal of making thema hub of knowledge and information sharing for 18,000 F/PTCs by the end of GTP-II.;
- Build the capacity of at least 80% of the existing technical staff at various levels on marketing, value chain development, facilitation & communication skill, knowledge management, etc.… to provide market oriented extension services by the end of GTP-II;
- Increase the number of extension beneficiaries from the current 15,200,000 to 18,237,000 households (men, women, and youths) by the end of GTP-II;
- Increase the number of full package (crops, livestock, and natural resources) beneficiaries from the current 23% to 80% by the end of 2025;
- At least 50% of smallholder farmers linked with improved markets through establishing and strengthening market infrastructure and information system by2025;
- Enhance implementation of pluralistic extension services through establishing clear guidelines and regulation to diversify sources of extension services to men, women, and youth;

[1] *Pluralistic extension system includes public extension service, producer and commodity organizations, processing, and trading enterprises, NGOs, private extension service providers, input suppliers, universities and the research system.*

- Improving the access and management of agricultural knowledge and information to farmers through establishment and strengthening of digitalized and ICT-based communication system in at least 80% of Kebeles/FTCs by 2025;
- Enhance vibrant and dynamic linkage among development actors and extension service providers' through the establishment and functioning of effective and sustainable platforms for improved collaboration, cooperation for information exchange and feedback system;
- Ensure mainstreaming of gender, nutrition, and environmental issues in the extension service delivery to bring sustainable development;
- Build farmers, agro-pastoralist and pastoralist resilience to cope with climate changes and drought through use of climate adaptation and mitigation strategies in the extension system; and
- Establish and implement Performance and Result Based-Monitoring, Evaluation and Learning (PRB-MEL) to improve the effectiveness, efficiency and impact of the extension services.

2.2. Intended outcomes

Outcome 1: Farmers, agro- pastoralists and pastoralists including women and youth become strong economic drivers who have access to and control over resources, extension and financial services and are active members ofrural economic organizations to ensure food and income security.

Outcome 2: Smallholder farmers, agro-pastoralists and pastoralists, and their organizations have improved income and food security through better access to production technologies and sustainable market systems, supported by appropriate commercial investment, public finance and the regulatory environment.

Outcome 3: Smallholder farmers, agro-pastoralists and pastoralists become more resilient to risks and climate change effects and increase investments in agricultural risk management(ARM) and climate smart agriculture (CSA).

Outcome 4: Smallholder farmers, agro-pastoralists, and pastoralists have improved livelihoods through diversified and market-oriented advisory services.

Outcome 5: Smallholder farmers establish and operationalize their own self-help farmers groups to initiate farmer-to-farmer knowledge exchange and enhance local capacity, which will gradually grow to local level organizations and institutions.

2.3. Key guiding principles

Market-oriented and demand driven extension system: To increase farmers' incomes and improve their livelihoods, the extension system needs to provide market-demanded technologies, link producers with buyers, input and credit suppliers, providing market information, and promoting collective marketing.

***Government-led pluralistic extension service*:** The government will maintain its lead role in the provision of extension services but will provide an environment that motivates and encourages the involvement of the private sector in extension services. A pluralistic approach is expected to maximize the reach of extension services into rural communities and provide a diverse range of extension services through enhancing collaboration and integration between public and private partnership.

Participatory and multiple extension methods and approaches: The extension system needs to be interactive and responsive to farmers' needs by encouraging active participation in problem identification, priority setting, planning, implementation as well as monitoring and evaluation. In this process, farmers, agro-pastoralists, and pastoralists will be seen as clients/change agents. Organizing farmers into different development and extension groups will help facilitate this participatory approach, taking advantage of farmers' indigenous knowledge. In extension, there is no hard and fast rule. Therefore, use of multiple extension communication methods is strongly advised.

Value chain and agricultural commercialization cluster extension approach:Extension services need to provide facilitation and advisory services for the entire value chain development of a commodity, from input supplies, production, processing, and marketing. This will strengthen market linkages among producers, agro-industries, processors, and retailers for a greater impact in changing subsistent agriculture into a commercial one.

Location and agro-ecology specific interventions: The extension system shall adjust its service delivery in accordance with the different agro-ecologies and farming systems (including livestock, irrigation, and rain-fed) rather than follow a one-size fits all approach. Instead, the strategy will focus in providing menu of innovative options. In the process of technology development, the extension will influence the research system to generate location specific and demand driven technologies.

Gender youth and nutrition mainstreaming: The extension system should give special attention and support to women by encouraging their participation in the extension system and ensuring services provided address their special needs. In addition, focus will be given to incorporate nutrition-sensitive extension services.

Mainstreaming of environmentally sustainable agricultural practices:The extension system should promote agricultural practices that conserve natural resources and apply appropriate technologies for efficient use of natural resource while at the same time being economically viable, socially acceptable and environmentally friendly extension services.

Competent and skilled human resource: Development of modernized agriculture and extension system requires competent, energetic, and dynamic workforce. In line with this, the role model played in the past and the current ongoing progresses by HLIs and ATVETs inproducing skilledhuman power for the agricultural development is highly recognized. Continued efforts in cultivating and producing competent skilled human power that could respond to the diverse needs of farmers and pro-actively move the agricultural development of the country forward is critically important. Thus, capacity-buildingprograms(short- and long-term)by the HLIs targeting different actors' vis-à-vis developing competent and dynamic learning institutions are vital to put this strategy into practice sustainably.

Specialization and diversification:Diversifying the agricultural products grown by a local community improves the resilience of farmers to natural calamities and helps conserve their existing natural resources. Specialization enables farmers to focus on profitable andmarketable commoditiesbased on the comparativeadvantages of the farmer. Depending on their available potential in their local condition, farmers, agro-pastoralist and pastoralists will be encouraged to make use of either both or one of the approaches.

Process and result oriented extensionservices: Theextension service must be target and result oriented so as to bring visible changes in livelihoodsof the farming community at household levels that also potentially contribute to the national economy. This means, every approach and services must be customized towards achieving the best results that fully satisfies all farmers. This can be attained through the provision of financial and economic viable technologies and other associated services for different categories of commodities.

Inclusive extension services: Extension is more impact full when the approach considers "the whole family and community approach"instead of focusing only on model farmers and household heads. This means, when the extension service is designed and implemented, it has to take into consideration the needs and interest of male, female, youth including disabled farmers, in all farming system including agro-pastoral, pastoral,urban &peri-urban areas. This also includes private sector, investors and processers.

Collaboration and harmonization with othercomplementary services: The provision of extension service will be successful and effective when the other support services such as sustainable input supply, access to finance, market infrastructure development, etc. are provided in an integrated/harmonize ways. Therefore, extension system needs to work closely with all relevant institutions to ensure the complementaryservices are in place as per the demand of end users.

Scaling out &up of good practices: Efforts should be continuously directed to identifying successful practices which can be scaled out &up with the aim of effecting massive changes in the livelihoods of farmers.

Responsibility & accountability:In order to fully implement effective extension and bring about the desired change, it is essential to share roles and responsibilities among implementing partners, individuals and leadership at all levels. Sharing roles and responsibilities are not an end by themselves unless accountability measures are put in place at different levels. To this end, extension staff, leadership, as well as professionals will be accountable for the shared tasks and responsibilities. It is expected that MoANR will lead and responsible to coordinate the development, approval and overseeing the implementation of the strategy across

the country by engaging and mobilizing all stakeholders including line ministries, regional bureaus, research institutions, HLIs, NGO's, private sectors and other development partners. Individuals should be recognized for the work they have accomplished and asked for things that are not implemented as per this strategy.

Section 3: Pillars, systemic bottlenecks and corresponding strategic interventions

This section outlines ninekey pillars on which this strategic document was developed. For each pillar, systemic bottlenecks have been identified and analyzed, and their corresponding strategic interventions proposed. Strategic interventions have the potential to transform the Ethiopian agriculture tomodern andcommercialize farming system.

3.1 Pillar 1: StrengthenFTCs through active participation of community and capacity building.

Objective: To make FTCs hubs for knowledge and information sharing for promoting improved technologies and good practices and creating self-sustaining FTC management systems that owned by the community.

The Ethiopian agricultural extension system isbased on farmer training centers (FTCs) supported by trained DAs. Currently, government is progressing well in its goal to establish oneFTC in each Kebele. So far about12, 500 FTCs have been established and regional governments are aggressively moving forward toestablish the remaining FTCs to meet the national target of 18,000FTCs. While it is widely agreed that FTCs serve as an entry point to bring about behavioral changes among farmers and lead them towards modern and commercial agriculture. The establishedFTCs are found at varying levels of functionality and currently most of them are not capable of providing the expected services to farmers. The following bottlenecks have been identified.

Bottleneck 3.1.1: Limited involvement of farmers in FTCs management

The existing FTC guideline indicates that FTCs are the property of farmers and are expected to be managed by them. However, farmers perceive FTCs as government institutes rather than their own due to low level of awareness and lack of clarity on the basic advantages of FTCs.The problems are aggravated by inadequate resources of FTCs, low efforts of DAs to bring about changes, and use of FTCs for non-extension activities. As a result, many FTCshave remained idle. Moreover, most FTCs don't have FTC-Management Committees (MCs). In FTCs where MCs exist, they do not function to the expectations. For example, in theintervention Woredas of Oxfam America (OA) andSasakawa Global (SG 2000), only 42% of FTCs reported to have MCs that are responsible for overall management and operations of the training centers.Of the total established MCs, only about 21% were operational in 2011(OA, 2011).

Bottleneck 3.1.2: Insufficient resources for FTCs

One of the reasons for poor performance of FTCs is related to shortages of resources for operations and renovations. For instance, almost all FTCs (except for those supported by projects or NGOs) have inadequate funds and lands for practical training, establishment of demonstration plots, and other basic infrastructure and facilities such asbasic furniture, farm implements, ICT and training materials. Most FTCs are nottimely maintained or repaired.Poor business plans in FTCs and wide skill gaps by FTC-MCs and DAs have exacerbated resource limitations. In addition, the support and emphasis given by local and regional bureaus is very limited. This has been particularly inadequate in physical and financial resources value-added management, technical advice and regular follow-up to make the FTCs function as desired.

FTCswere not meant to generate their own revenues. Those that generated revenues did not have the legal right to re-use the generated income. However, recently some efforts are being made in few regions that allow the use of revenue generated by these FTCs.

Bottleneck 3.1.3: Most FTCs have no long-term plans for sustainability

Most FTCs lack a long-term vision and plans to sustain themselves and contribute to agricultural development. This is mainly due to low awareness of FTC-MCs and DAs on the long-term benefit of the FTCs and limited capacity in business plan preparation and implementation. Limited guidance and practical support to FTCs by frontline extension workers has also contributed to the problem. In addition, inadequate follow up and monitoring system at all levels is also mentioned by stakeholders as another major problem.

Bottleneck 3.1.4: Inadequate incentives to motivate and retain DAs

Ethiopia has the highest DA-to-farmer ratio in the world (IFPRI, 2009). Government has trained about 83,000 DAs with specialization in plant sciences, animal sciences, and natural resources management (NRM). However, according to recent assessments made byMoANR indicates that over 56,000 trained DAs are currently working at FTCs. This indicates that either a number of graduated DAs are not interested in working in agricultural extension or there is a high turnover of DAs potentially due todissatisfaction withtheirjobs. The major factors appear to be poor working environment (inadequate housing, inadequate office facilities, limited transportation facilities etc.), inadequate incentives, andan unattractive career path with big variability among the regions, heavy workload, and lack of a clear line of command.

Bottleneck 3.1.5: Limited knowledge and skill of DAs

According to the study by IFPRI (2009), DAs have inadequate knowledge and skills to discharge their roles and responsibilities properly. Gaps in knowledge and skill of DAs often hinder their ability to provide quality extension service. The key gaps and limitations include communication and facilitation skills, participatory approach and rural problem analysis, business plan and value chain development and marketing, conflict management, data collection, analysis and reporting. Similarly, most DAs do not have sufficient technical knowledge and skills to provide hands-on training and demand-driven advisory services. Apart from these, DAs lack FTC managerial and leadership skills to mobilize and use resources efficiently with active participation of the community.

Bottleneck 3.1.6: Limited training to farmers

In most cases, training to farmers in FTCs is mainly focused on crops with major emphasis on theoretical concepts, although recently changes are being realized in terms of its both scope and range of training services. The training also lacks the necessary teaching aids, often one-way, poorly organized, not season-based and agro-ecology oriented. In addition, training impact assessments are not conducted to determine any changes realized and take corrective measures in cases where changes are not satisfactory.

Bottleneck 3.1.7: Inadequate incentives for model farmers

The extension system uses model farmers who have relatively better resources and early adopters to test and disseminate improved technologies and best practice sat both FTCs and their own farms. The assumption, however, is that such farmers can improve the extension coverage by assisting other farmers who are resource poor and resistant to using innovations. Model farmers, however, complain that they are not compensated for their time and energy in supporting other farmers. Moreover, there is also lack of clear guideline to identify and promote the use of model farmers in testing innovations and sharing their knowledge and skills to other farmers. As a result, there is inconsistent and irregular rewarding mechanism.

Proposed key strategic interventions

Intervention 3.1.1: Increase sense of FTC ownership by farmers to improve FTC functionality and sustainability

FTCs cannot function effectivelyunless farmers take ownership and an effective management system is put in place. Increasing a sense of ownership may happen if farmers are convinced of the short and long-term benefits of FTCs. Clear guidelines should be madeavailable that describe roles and duties of farmers and other stakeholders. Based on such guideline, farmer-led FTC-Management system should be established in each FTC with due consideration of women and youth representation. Following this, the capacity of FTC-management committees (MCs) needs to be built through different means such as organizing specific trainings on FTC management, intra and inter regional experience sharing visits and field days on a regular basis. While building the capacity of farmers, priorityshould be given to practical skills training that will increase the participation and ownership of the MCs in particular and the farming community in general.

Box 1: Success of a farmer-led FTC in ArsiNegelle, Oromia Region

ArsiNegelle can be a good example of a successful farmer-led FTCs. To address the issue of limited farmer awareness of the benefits of FTCs, the Woreda ran a series of well-planned events aimed at increasing local farmers' appreciation of the relevance of a well-functioning FTC

Following this, gender sensitive and farmer-led FTC management committees were established in a participatory and interactive manner following guidelines that clearly stated the roles and duties expected from every member of the management committee. This approach led to a number of improvements: establishment of responsive farmers-led FTC management, development of weekly FTC action plans, introduction of context specific revenue generating schemes through sustainable loan granting system, practical trainings (at least two hours per week) on demo plots, and continuous progress tracking, monitoring and evaluation systems. Because of this, FTCs in ArsiNegelleWoreda that are supported by the Gates Foundation project and implemented in partnership by MoANR, SG-2000 and OA were found to be a model for adopting new technologies and best practices. The projects benefited about 19,000 farmers. A significant number of visitors from within and other neighboring regions, including top officials have visited these FTCs for experience sharing and learning.

The success was achieved because of good leadership of the Woreda administration, facilitation of the Woreda staff and capacity building by OA and SG-2000.

Intervention 3.1.2: Allocate sufficient resource to FTCs

FTCs need to be funded through a range of diversified sources. Government is expected to provide seed money for a fixed period of time, which has been already outlined in the FTC guideline. Recently, there is a good start to allocate some amount of initial capital to be used as revolving funds for some FTCs.Similarly, in few regions, revenues generated by the FTCs are being allocated to FTCs. However, during the field visit, it was noticed that the money allocated to FTCs and revenues generated by the FTC in few regions are not sufficient to fully transform FTCs to the desired levels. Communities should also be encouraged to contribute their labor and locally available materials required by FTCs. Since FTCs are an entry point for extension services and a means for rural development; donors, NGOs and private actors should also involve in providing support to FTCs through their programs and projects with regards to supply of basic resources, in addition to finances. Ensuring the provision of agricultural land that represents the farming system of the Kebele with minimum size as per the FTC guideline is needed.

At the same time, efforts must be focused on improving resource management and utilization. Clear guidelines on resource management and utilization should be made available by taking the government financial rules and regulations into consideration. FTCs should be encouraged to generate their own revenues while undertaking feasible demonstrations to promote their operations in a sustainable manner– although revenue generation and profit making should not be taken as a major objective for FTCs, at least in the short-term.

Intervention 3.1.3a: Furnish and equip FTCs with basic infrastructure and facilities

FTCs need to have basic infrastructure and facilities for proper functioning. The full list of facilities required is outlined in the FTC guideline. DA housing and offices; classrooms with appropriate training materials and furniture; farm implements for crops and livestock production; tools required to properly manage NRM; workshops, a permanent exhibition center; demonstration plots; meteorological information center; andICT facilities are among the major ones . FTCs with a good set of facilities will improve FTCs' performance and attract farmers. In addition to required facilities, FTCs must be equipped with basic items to avoid waste with adequate levels of accountability for the maintenance and safekeeping of the facilities built into the system.

FTCs should be capacitated in accordance with FTC classification shown in Table 1. This classification willguide the types of resources required to upgrade the FTCs to the next functionality level.

Table 1: FTC classification: minimum criteria by functionality levels

Basic	Intermediate	Advanced
• At least 3 DAs, • Moderately furnished FTC building, • Agro-ecology based FTCs and demonstration plot, • FTC training and demonstration plan, • FTC management committee and • FTC operational guideline.	• Active community management structure, • Adequate level of facilities, /equipment in place for FTC training and demonstrations, • Trainings and demonstrations at least in three thematic areas, • FTC trainings efficiently linked to demonstrations, • FTC training materials, manuals and guidelines available.	• Revenue generation for self-sustainability, • Active linkage with cooperatives, micro-finance institutions (MFIs), research centers and ATVETs and farmers innovations groups, • Availability of operational resource centers (connectivity, information), • Ability to handle level 1 & 2 training. • Provision of full-fledged extension services to farmers

Intervention 3.1.3b: Improve support to FTCs by the local government

Extension management bodies at all levelsin general and local level governance in particular, need to emphasize the central roleof FTCs and accordingly put maximum efforts with regard to human and physical resourcing, capacity building, and coaching to ensure the success of FTCs. At the same time, Woreda level extension management must allow for and enhance decentralized decision-making and ownership at the FTC levels, while also ensuring forproper feedback collection and communication. Support from extension management bodies should take the form of, among others, allocating adequate budget for the construction of FTCs where they are not established. In addition, allocating sufficient land for demonstration, ensuring quality extension service in the established FTCs, and establishing close monitoring of day-to-day performance are among some of the key roles expected to be played by local government. The management team is also expected to mobilize communities and strengthen FTC-MC to properly play their roles. Local level government must also recognize high performing FTCs, FTC MCs, DAs, DA supervisors, and kebele agricultural offices by establishing well-organized and structured rewarding system.

Intervention 3.1.4: Improve facilities, career-path and better incentives for DAs

Motivating and retaining frontline extension workers need to be considered a high priority. Atthe minimum, basic facilities such as housing, transport, uniforms, and office materials must be provided to maintain decent working conditions for DAs. Providing DAs with some agricultural land for them to engage in agriculture using improved technologies will enable them to develop their practical skills, generate income, and sustainably introduce innovations and good practices to the local communities for enhancing adoption. In addition to this, incentive packages for DAs and DA supervisors should be developed linked to measurable performances that canbe adhered to across all regions. Incentives for good performance may include in-kinds, cashbonus, long-term training, exposure visits, and public recognition.

Intervention 3.1.5: Build DAs knowledge and skills

DAs are among the main actors of the extension system. They are expected to have adequate knowledge and practical skill to provide demand based advisory services. Their role is criticalincreasing modern farming communities. Nevertheless, in order this to happen, capacity of the frontline extension workers needs to be built on a regular basis by taking into consideration the critical gaps and limitations on the ground, government's new plans and needs, and current growing demands for agricultural extension services.

Intervention 3.1.6: Strengthen need based and practical training to farmers

Farmer training in FTCs should focus on the priority needs and existing gaps as identified together with farmers as well as by taking into consideration emerging needs of the government, agro-processing and investors. Farmers' trainingby DAs must also adapt toadult and experiential learning methodologies. In most cases, farmers learn more when the training is provided in a two-way learning method, supported with relevant audio-

visuals and consider farmers' indigenous knowledge and when their experiences are shared among the participants (BergaLemaga*et al*., 2013). The following principles should guide development and delivery of training:

- **Emphasize practicalskill:** Trainings should be 70% practical and 30% theory;
- **Adapt to circumstances:** Organize trainings based on convenient timing to male, female and youth farmers, seasonal activity and specific agro-ecologies;
- **Use quality trainers:** Use well-qualified and experienced trainers who build farmer's interest in FTCs; and
- **Evaluate regularly**: Conduct training method and relevance assessment during and after the training.

Intervention 3.1.7: Strengthen model farmers with gradual shift to the use village promoters

Model farmers who are relatively better in education, experience, and approved by their village members are suitable for technology promotion. Model farmer approach will be continued with the gradual shift to village level development promoters. For instance, the experience from India shows that village-level development promoters (VLDP) are playing an important role in technology promotion and dissemination. The village level promoters will be selected by the communities with the main purpose of strengthening farmers' learning platforms and enhance technology promotion, market linkage, alliance building and networking in their villages. Farmers who are considered as innovative and respected by local communities can be selected as a VLDP based on their specific experiences, and specialization (e.g. apiculture, apple, and fattening). The selection criteria for VLDPs need to be further developed and refined agreements established between VLDPs and Kebeles. Creating effective VLDPs requires special support and capacity building. Appropriate incentives for VLDPs need to be put in place to compensate them for their time and effort. These incentives should be based on clear guidelines to ensure transparent, consistent, and sustainable implementation across regions.

3.2 Pillar 2: Enhance agricultural knowledge and information system

Objective: To use effective and diversified communication channels(including ICT-led extension service delivery)to enhance access to knowledge and information exchange and utilization among beneficiaries

In today's knowledge-based economy, knowledge management and information has become a key driver of productivity, efficiency, and development. An organization's most valuable resource is the knowledge of its people. The extent to which an organization performs well will depend, among other things, on how effectively its people can create new knowledge, share knowledge around the organization, and use that knowledge to best effect (NHS National Library for Health, 2005).

Effective knowledge management enables appropriate knowledge and information to reach smallholder farmers and other practitioners at the right time and in the right way. An effective knowledge management and information communication willhelp generate, capture, store, anddisseminate to the intended users on a continual basis. Access to information empowers farmers and creates sustainable linkages to networks of service providers for improved services, capacity building, and financial resources.

As demonstrated in Figure 2, knowledge is created through scientific (universities, research institutes, and others) and indigenous knowledge (farmers, farmers groups, local institutions) stored through written documents/publications and electronic media such as computer, website and audio-video and is disseminated to wider audiences through radios, TVs, publications, exhibitions, mobile phones etc.

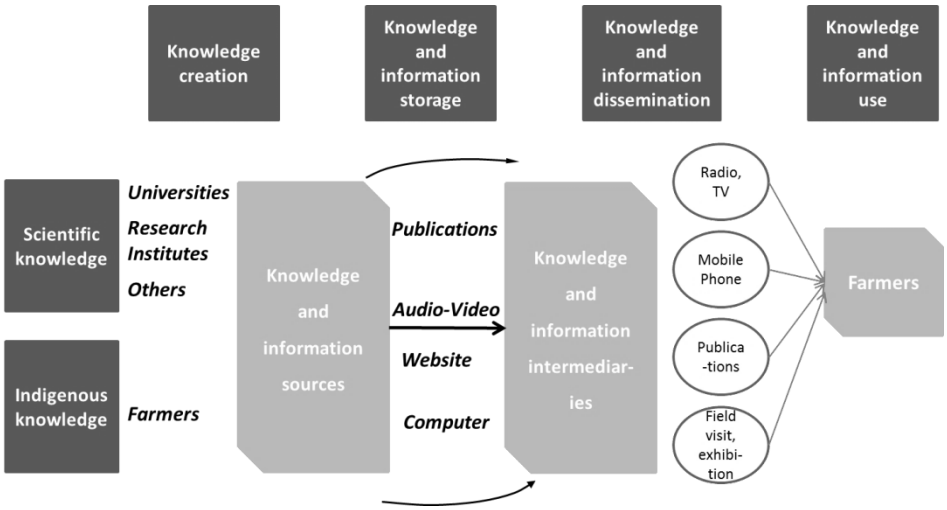

Figure 2: Creation, accumulation and dissemination of agricultural knowledge using different methods (adopted from UNDP, 2012)

Bottleneck 3.2.1: Poor utilization of ICT-based extension services

Use of ICT for agricultural extensionremains low in Ethiopia when compared with other Sub-Saharan African countries. For instance, in Kenya, smallholder farmers get technology-related advice as well as location-specific market information on inputs and outputs through ICT kiosks. On the contrary, in Ethiopia, there is limited access to modern agricultural knowledge and information system developed by research and HLIs resulting in insufficiently designed extension packages to meet current diverse farmers' needs. In addition, there is a loose engagement among these stakeholders, which has hindered centralized knowledge management, dissemination, and utilization.

Bottleneck 3.2.2: Limited access to improve agricultural knowledge, information, and technologies

In Ethiopia, there is limited access to modern agricultural knowledge and information by research, HLIs, and private sectors to farmers and other stakeholders. This has resulted to low use of improved technologies and information by end-users, which contributed to low agricultural production and productivity nationwide.

Even if technologies are generated, they are often not available to most farmers due to lack of systematic, centralized technology development and dissemination mechanism (Stakeholder consultation, 2012). In particular, strategies and mechanisms to register and release improved technologies of livestock, mechanization, irrigation water management, and NRM are lacking. As a result, the supply of these improved technologies does not meet farmers' high demands. Moreover, the participation of private sector and farmer organizations in multiplication and dissemination of improved technologies and inputs (seeds, breeds, feeds, AI, and farm tools) are observed to be very low.

In addition, the current practice indicates that farmer's indigenous knowledge is widely used across the country. However, priority has been given to promote improved technologies and practices mainly generated by research system. As a result, the emphasis for collection, identification, analysis, and dissemination of indigenous knowledge is very limited.

One of the other challenges facing farmers to use agricultural technologies is associated with limited financial services. Particularly, resource poor farmers are often excluded from finance utilization due to the difficulty in meeting strict criteria such as collateral and a bureaucratic process.

Bottleneck 3.2.3: Limited agricultural knowledge & information base for urban and peri-urban communities

Many countries in the world benefit significantly from urban and peri-urban agriculture for food & nutrition security and income generation. It also provides employment opportunities, especially for youth and women. In Ethiopia, urban and peri-urban agriculture is mostly traditional and not supported by extension system to access improved technologies and information tailored to urban and peri-urban. The peri-urban agriculture is in close proximity to industrial waste or polluted rivers resulting in products with heavy metals. This has negatively affected human health and incomes of farmers engaged in urban and peri-urban agriculture. This is mainly due to

lack of a clear institutional arrangement and limited extension services that potentially link peri-urban agriculture with agro industries.

Bottleneck 3.2.4: Inadequate consideration to farmers needs in research agenda setting and extension Package development

Although recently much has been improved, the process for technology generation and research agenda setting is done with a limited participation of farmers and assessment of existing problems and priority interests. Because of this, often there is complaint that technologies by research do not adequately consider farmers' demands in various locations and agro-ecologies. The research findings are often verified on very limited farmers' plots without demonstrating them in wider agro-ecologies and socio-economic structures. When such types of technologies are introduced over wide areas with diversified, complex and risks situations, the technologies become unsuitable and leading to little or no adoption. The poor linkage between research, extension, and farmers has exacerbated the problems.

Moreover, the extension packages are designed often without taking into consideration farmers' heterogeneity and their priority needs, agro-ecologies, education, gender (male, female and youth), socioeconomic status, and type of farming. While the extension service is decentralized, higher-level extension support organizations (Federal and Regional levels) have limited capacity to align extension packages with local farmers needs in the different regions to offer custom-tailored packages. As described above, most extension workers also lack the required technical skill for the preparation of extension messages/packages that are tailored to farmers. Besides, the unique needs of model farmers and out-growers remain unaddressed.

The vast majority of the farmers in Ethiopia, regardless of their being pastoralists, agro-pastoralists or sedentary, are involved in livestock production. Livestock influences the livelihood of farmers directly as draught animals and source of products such as milk, meat and other products; and byproducts such as hides and skin as well indirectly as a source of manure for better crop production. Despite all these, there is limited activity focused on livestock and extension packages.

Bottleneck 3.2.5: Limited access to knowledge and information on agricultural risk management

Farming in Ethiopian is exposed to various risks such as weather and climate, prices, crops/livestock diseases and pests, conflicts etc.… all of them contributing to affecting the livelihoods of smallholder farmers. As known, smallholder farmers, who have limited access to information related to agricultural risks management, dominate the sector. Moreover, agriculture in Ethiopia is predominantly rain fed which makes it directly vulnerable to weather and climate related hazards and provide little flexibility for adjustment to cope up with other risk factors. The agricultural extension service of the country is also identified to lack effective mechanism for timely sharing of knowledge and information related to agricultural risk management system to enable the local communities to take appropriate decision and remedial action on time to adjust their agricultural activities with the ongoing changes. As a result, smallholder farmers cannot get timely and tailored-made agricultural risk management information to put in place appropriate risk mitigation mechanism to reduce the impact of agricultural risks.

Key Proposed Strategic Interventions

Intervention 3.2.1: Promotion of Digitalized &ICT-based extension communication system

Having the right message, the right audience, and the right products may not achieve the intended results unless they are delivered through appropriate channels. In Ethiopia information reaches farmers mainly through indirect (radio & TV) and direct verbal communication channels which include training, meetings, conferences and social gatherings, followed by learning through direct observation. The effectiveness of these channels can be enhanced by enabling farmers to have access to new information and communication technologies (ICTs). ICTs are an efficient and scalable way of getting information to farmers in an engaging form – for example, "Digital Green video based approach "is a technology platform where farmers themselves demonstrate best agricultural practices to their fellow farmers through videos and respond to each other's questions.

The following interventions will help diversify the extension communication channels to effectively reach farmers in diverse socialclasses (gender, wealth, age, etc.) and agro-ecologies.

- **Establish ICT-kiosks:** Improve technology-related advice, as well as location-specific market information on inputs and outputs through ICT kiosks linking Federal systems down to Kebeles/FTCs;
- **Establish data and performance management system:** Online and offline application using the ICT tools to easily connect and facilitate collaboration among the various agricultural development actors;
- **Promote ICT-based technology promotion and dissemination:** Using different ICTs like mobile phones, IVR-8028, video-based extension approach, DIGISOFT, Digital Agriculture, farm radio, TVs etc. Build institutional capacity of agricultural extension providers in ICT application for example Woreda-net,school-net, agri-net, text message viasmart phones, call center services, and video supported teaching aids etc. In addition, developments of online extension portal that link education, research, and extension organizations and ensure availability of up-to-date information to extension workers/SMSs are essentially important;
- **Knowledge resource centers:** Establishknowledge resource centers at Woreda level to offer up-to-date information for extension workers, subject matter specialists (SMSs) and farmers are also needed. Similarly, use of internet and database in knowledge center like FTCs will be strengthened; and
- **Use of social media**: Social media have great role in agricultural knowledge and information dissemination among experts and farmers. Therefore, use of different social media such as Facebook, Twitter, LinkedIn, and WhatsApp's, will be promoted and used as needed.

Box 2: Success story on IVR- 8028

The IVR 8028 hotline service was created by the Ethiopian Agricultural Transformation Agency (ATA) in collaboration with MoANR to place the extension information or messages on a technology platform that can be accessed by farmers at any time. The hotline began its services in the four major regions (in their respective regional languages) in mid-2014. Within a few months, the hotline received 1.5 million phone calls from 300,000 registered callers, providing them an answer to major issues farmers are encountered as a problem in their agricultural activities. This example demonstrates the need for improved, technology-based information channels by farmers.

Intervention 3.2.2a: Strengthen farmers group based extension services

Farmers' groups can be used as platforms for promotion of agricultural extension services. Extension delivery will be easier when farmers are organized in groups. It helps to reach large number of farmers with minimum cost, less work force and time when compared to individual communication method. It also provides an opportunity for farmers to work together to resolve their common problems and build their confidence through peer-to-peer learning. While the capacity of the groups is strengthened, it has an impact on the livelihood of individual members and their families through accessing better extension services, technologies and harnessing joint learning. Farmers' groups are also valuable institutions to access resources such as credit, labor and information because of economies of scale, and enable farmers to forge stable relationships with suppliers and reliable markets. Currently, efforts are underway to provide extension services through group approaches such as farmer development groups, farmers' innovation groups, Farmers 'FieldSchools (FFS), farmers' common interest groups, farmers' research extension groups, with the basic principle of enhancing social networks and farmer learning in extension system. Therefore, the following measures need to be taken to further enhance the use of farmers group for extension service delivery.

First, there is a need to promote real participation of farmers in the process of group formation and development. Second, farmers should be organized based on their common interest. Third, build the capacity of the extension staff on group dynamics and facilitation skills to effectively support farmer groups achieve their major objectives. Fourth, review and update guidelines for comprehensive and inclusive farmers' group formation. Farmerscan be organized at the village level to enhance farmer-to-farmer learning, to assist DAs, and contribute to reach large number of farmers.

Intervention 3.2.2b: Strengthen agricultural knowledge management within the extension system

As illustrated in Figure 3, knowledge management is a process that includes knowledge creation, identification& capture, storage, sharing, learning and its utilization. Knowledge is developed through experimentation, adaptation, confrontation and other learning settings, which result in knowledge products. In knowledge management, farmers, researchers, extension agents, policymakers, and others are considered key actors in influencing the knowledge process and its ultimate utilization. For the circular flow of knowledge management to happen, both knowledge that is sufficiently better than the existing knowledge and means for transmitting it must be available. In knowledge management, the synchronization of scientific knowledge with indigenous knowledge is critical for reinforcing and developing applicable and re-refined knowledge.

Figure 3: Knowledge management process (adopted from Cong et al., 2007)

To improve the effectiveness of agricultural knowledge, it is essential to develop a mechanism that generates, captures, disseminates knowledge and information using effective processes and institutional arrangements as well as effective utilization of information and communication technology (ICT).This strategy intends to enable the integration of traditional or tacit knowledge of farmers with modern knowledge (generated from research,

universities and extension), and to further enhance the utilization of knowledge disseminated to smallholder farmers. Hence, the following key interventions are proposed.

- Strengthen/establish vibrant synergies for knowledge management and networking among key development actors.;
- Use information and communication technology (ICT) to facilitate rapid, efficient and cost effective knowledge management. The experiences of most countries indicate that rapid development of ICT, which facilitates the flow of information has tremendously enhanced the knowledge management practice in agriculture;
- Strengthen and better network FTCs to be used as a source of agricultural knowledge and information exchange among researchers, extension workers, and farmers and also as an input for policy;
- Establish working online and offline platforms using the ICT tools to easily connect and facilitate collaboration among the various agricultural development actors (including extension workers, researchers, etc.); and
- Involve male and female farmers in the knowledge management process and generate knowledge in a participatory process to increase the chances of its adoption. This also enables the integration of indigenous knowledge of farmers with recent research findings and further enhances the utilization of knowledge disseminated to smallholder farmers.

Intervention 3.2.3: Enhance agricultural knowledge and information provision for urban and peri-urban communities

Despite urban and peri-urban farming communities being near to towns, they do not have an access for agricultural knowledge and information. Thus, the following measures need to be undertaken.

- establish sustainable and an enabling institutional platforms;
- develop pragmatic urban and peri-urban extension service delivery;
- identify appropriate technologies and made accessible to users including youth and women in urban and peri-urban;
- develop environmental safety and appropriate quality standard mechanisms that can be regulated and practiced;
- provide necessary training that fits to urban and peri-urban communities; and
- create and facilitate input and output market linkage in a sustainable manner.

Intervention 3.2.4a: Enhance participatory technology development, verification and dissemination

Low farmers participation in technology development, and the notion that "experts know best" for farmers, has resulted in low adoption of new technologies. Increasing participation could be achieved by

- **Promote farmer-focused research agendadevelopment:** Adapting the research agenda to reflect farmers' needs through improving their participation from problem identification up to planning to monitoring and evaluation. This can be affected through developing farmers, voices diagnostic feedback tools and technology tracking tools that clearly show the pros and cons of each specific technology under farmers' conditions.;
- **Promote active participation of different stakeholders:** Build the capacity of farmers on concept of participatory technology development, verification, and dissemination in collaboration with research, extension and other actors;
- **Establish working and sustainable platforms among key actors**: Establish and strengthen annual platforms to debate the benefits and challenges of improved technologies taking farmers, women and youth into consideration;
- **Promote agro-ecology and cluster-based technology development and dissemination:** New technologies/innovations should be promoted and disseminated within different agro-ecologies and farming conditions to enhance their adoption. Technologies should be integrated with the existing indigenous knowledge and farming practices through on-farm trails and demonstrations. Farmers need to be convinced about the effectiveness of new agricultural technologies if they are to make use of them (Berga*et al.*, 2013);and
- **Promote indigenous knowledge:** The research and extension system need to consider indigenous knowledge in technology generation and extension advisory services to be provided. Therefore, collection, identification, analysis, validation, documentation, and dissemination of indigenous knowledge are very important.

Intervention 3.2.4b: Prepare and provide diverse andclient-tailored extension packages & advisory services

In order to provide diverse and client-oriented extension packages and advisory services, the following interventions are proposed.

- Identify and map out target audiences and their specific demands and market needs;
- Identify the available technologies with regard to crops, livestock, NRM, and other crosscutting issues and make sure that the technologies are up-to-date and demanded by farmers.;
- Develop the content of the message through participatory and interactive approaches with model farmers and professionals from research and other institutions to ensure the packages are demand driven. Content can be delivered in audio, visual, and written formats to reach farmers with varying levels of education and literacy;
- Prepare extension messages and necessary guidelines looking through the gender lenses to incorporate relevant messages in a clear language. Consulting with male, female and youth farmers are strongly recommended;

- Select appropriate channels with due consideration of audiences and messages to be addressed.;
- Build the capacity of farmers and frontline workers with clear training framework in consultation with farmers. The training must be practical accompanied by field visits and excursions; and
- Conduct an assessment on the relevance of trainings and technologies on a regular basis and improve accordingly.

In addition, the preparation of client-tailored extension packages and the provision of advisory servicesrequire effective capacity development for extension staff at various levels. To strengthen the ability of extension workers to make the extension package tailor made, the following should be considered.

- **Technical capacity improvement:** Building the technical capacity of frontline extension workers on extension message planning and content development with a focus on thematic areas of crop, livestock, postharvest and agro-processing, cooperatives, marketing, gender and environment;
- **Better use of technology:** Facilitating access to improved technologies and best practices on different commodities through both soft and hard ware combinations; and
- **Install infrastructure and audio-visual facilities:** It is necessary to install infrastructure and audio-visual facilities at resource centers at Federal, regional, and Woreda levels. These will include audio-visual facilities, computers, projectors, TVs, and others.

Intervention 3.2.5: Enhance the development of information systems for agricultural risk management

Knowledge and information management related to agricultural risk is critically important to provide and share timely information and knowledge related to agricultural risk management (ARM) to all key stakeholders including farming communities. This enables them to reduce the impacts of agricultural risks to improve agricultural productivity, andto contribute to the reduction of vulnerability and food insecurity in the country. The focus will be on mainstreaming of agricultural risk management issues into all agricultural sectors. Planning and implementation of ARM at all levels will help to improve resilience of farmers' to risk factors on creating knowledge-based partnerships and systems for information exchange amongtraining institutions, extension services and other public or private organizations. The targeted information areas will include market, crop and livestock insurance services, weather, production, diseases and available risk management techniques and tools. It will facilitate the implementation of ARM at institutional levels, while also allowing for a broader outreach to smallholder farmers through effective information exchange at various levels. Use of ICTs need to be promoted for agricultural risk information communication and advisory provision for agricultural risk management.

3.3 Pillar 3: Enhance client-oriented and multi actor's advisory extension services

Objective: To make the extension services diverse, client-oriented and reach different categories of farmers through improving the involvement of different actors engaged in agricultural development

An effective agricultural extension system needs to use broad range of actors to provide market-oriented and demand driven extension services to improve the livelihoods of farming communities. Thus, this pillar discusses the bottlenecks related to the provision of extension services by different service providers and its corresponding interventions to overcome the challenges.

Bottleneck 3.3.1: Limited involvement of stakeholders in providing extension advisory services

Ethiopia is a country with a wide range of agro-ecologies, extending from Wurch (mostly higher than 3700 masl) to Bereha (less than 500 masl). Recently, 33 agro-ecologies have been identified in the country. The farming communities within these agro-ecologies can be categorized as farmers, agro-pastoralists, and pastoralists with different capacities, needs, and priority interests. Hence, the extension services to be provided to these local communities should not be the same. Farmers also vary with the farming system, socio-economic setups, opportunities, and challenges facing agricultural development in their respective locations. Thesecall for involvement of an array of actors to address specific requirements.

In spite of its great importance, the implementation of effective pluralistic extension approach in Ethiopia, however, is at its infant stage. It is largely because of limited capacity and knowledge of the service providers, more skewed desire to profit making than to quality services. Moreover, unaffordability by farmers for private extension services, limited space, and support by the government and poor communication and coordination among the public and private extension service providers hindered the participation of multi-actors in the provision of extension services.

Bottleneck 3.3.2: Limited cooperation and collaboration between public and NGOsinextension services

In Ethiopia, there are a number of NGO's engaged in conducting different programs and projects in different parts of the country to support the ongoing public extension services. To mention few of them, SG-2000, OA, SNV, ASE, iDE, Digital Green, CARE-Ethiopia, Save the Children, World Vision, Farm-Africa, MEDA, Menschenfur Menschen and CCRDA.Even though, their contribution is realized, the alignment of their services with government extension services is found to be weak.

Some key reasons for this include:

- Although there is some improvements, MoANRhas not been playing the coordination role as expected specially in informing and updating the NGO's on government policies, strategies and directions for cooperation and collaboration in agricultural extension;
- Lack of transparency by some NGOs in terms of their strategies, approaches, and budget utilization resulting in low communication and inadequate working relationship; and
- Inadequate/monitoring of NGO programs at the grassroots levels and less recognition by extension coordination agencies on the contribution of the NGOs.

Bottleneck 3.3.3: Poor involvement of cooperatives and private sectors/agro-processing companies/ in extension service delivery

Currently agricultural cooperatives in Ethiopia are mainlyengaged with the provision ofinputs (fertilizers and agro-chemical), and in rare cases provide markets information to their members. However, their involvement in the provision of other complementary services such as farm implements, facilitating credit services, delivery of up-to-date price and market information are observed to be at its infant stage. In general, their involvement in the provision of complementary agricultural advisory service is identified to be meager although currently this has been quite improving especially by Meki-Batu Cooperative Union in Oromia Region (box 3).

Similarly, many agro-processing companies and private input suppliers provide extension services to farmers. Nevertheless, their efforts to create collaboration and integration with the other actors engaged with similar business resaid to be very low due to their limited capacity, experiences, and lack of clear regulation and guidelines.

Key Proposed Strategic Interventions

Intervention 3.3.1: Strengthen pluralistic agricultural extension advisory services

In the past, the government, development partners, and civil societies to diversify extension services and increase the coverage and quality of services have taken several initiatives. Pluralistic extension services in this strategy refers to the provision of extension advisory services by public extension service, producer cooperative & unions, processing and trading enterprises, NGOs, private extension service providers, input suppliers, universities and the research system.

For effective pluralistic extension service provision, the aforementioned actors have to work hand in hand. The government has to lead the effort to coordinate, facilitate and provide regulatory services in the process of giving pluralistic extension services by multiple-extension service providers. To strengthen pluralistic extension services, the following actions are suggested.

- **Create alignment between public and other agricultural extension actors:** This is critical to bring about a concerted effort that will ensure knowledge and information sharing, improve quality and coverage of extension services. Moreover, effective alignment and coordination avoids unnecessary duplication of efforts, wastage of resources and boost outcomes;
- **Develop an enabling environment for private extension providers:** Private extension providers play an important role in increasing farmers reach and addressing gaps in extension services provision. To maximize their contribution, it is important to analyze the challenges faced by the private extension providers and the extent of their current contributions to Ethiopia's agriculture. The government has to put in place an enabling policy, guidelines and directives that clearly inform their roles via capacity building, provision of credit facilities and support in the development of necessary infrastructure. As a result of their full capacity, it is indispensable to ensure that the services of the private sector are acceptable and affordable to significant number of farmers.; and
- **Guideline development:** The government is expected to develop a clear guideline on pluralistic extension services. The guideline should clearly outline the roles and duties to be played by each service providers and put in place

accountability measures. In this process, as mentioned above, apart from the development of the guideline the government is expected to play role in coordination, technical supervision, and quality control. To materialize this, in advance, mapping of private extension services providers need to be conducted through the engagement of target communities. This helpsto ensure that the demand required is adequately addressed, service providers are accountable, quality is maintained, and lessons learned and shared among the service providers.

Intervention 3.3.2: Strengthen the coordination between public & NGO's extension services

The current increasing demands from farmers on agricultural extension services requires the alignment between public and NGO's. This alignment can be realized through establishing annual joint planning, monitoring, learning, and evaluation, experience sharing through workshops, trainings and joint field visits in a cost effective manner. In addition, putting in place effective regulatory system and strategic framework for NGO's extension services through developing extension governance structure are critically important. This coordination and collaboration shall be carried out at different levels through the creation of fertile grounds for the involvement of various extension service providers to manage the demands arising from different social classes within different agro-ecologies and farming systems. In addition, installation of effective regulatory system and strategic framework forNGO'sextension services through developing extension governance structure is critically important.

Intervention 3.3.3a: Enhance cooperative-based extension advisory services

In Ethiopia, about 40,000 cooperatives have been identified to exist of which 25% of them are reported to be agricultural cooperatives (ATA, 2012). A study conducted by Quinones (2010) clearly indicated the importance of cooperatives in agricultural extension service provision. Cooperatives can provide specialized extension services by employing extension agents and/or contracting extension service providers to maximize their expected outputs to their members both in terms of improving the quantity and quality of their produce/products. To achieve this, farmer's cooperatives need to get necessary capacity building support in all aspects including, governance, leadership, and value chain development and engaged to provide need based and market driven extension services to farmers.

Box 3.: Success Story of Meki-Batu Cooperative Union on extension service delivery

Meki-Batu Vegetables and Fruits Growers' Cooperative Union was established with the participation of 12 primary irrigation water users' associations in May 1994 with an initial capital of around ETB 600,000. The main purpose was to have a collective force in the production and distribution of major horticultural crops and meet their common economic and social needs. The union has institutionalized its operations and relations with development partners, research centers, Oromia Seed Enterprise, Agricultural Office, Cooperatives and Trade Offices at all levels. The number of member primary cooperatives has increased from 12 to 150 and total irrigable land expanded from 400 ha to 3000 ha.

Based on the information from the Cooperative management in 2014, the association has a capital of around ETB 50m. Members have invested in various equipment and tools such as irrigation motor pumps, constructed biogas structures and are involved in different investment activities. The union constructed two modern and standard stores and vegetables packing house for the international market (Europe, Saudi Arabia, and Djibouti). Members have access to credit, input, and training services.

Intervention 3.3.3b: Improving the role of agro-processing and input supply companies in extension services

Currently there are around 455 agro-processing companies(http://www.ethiopianchamber.om/Data/Sites/1/downloadables/lm-scale-agro-processing-manufacturing-industries-in-ethiopia.pdf) engaged in

processing agricultural products such as coffee, livestock products (skins and hides, leather, live animals and meat), oil seeds, pulses, fruits, vegetables and flowers, textiles, natural gum, spices and mineral products that are traded in national and international markets (http://www.ethiopia.gov.et/investmentopportunities). These companies are primarily dependent on local raw materials to be produced by smallholder farmers.

Thus, agro-processing industries and companies need to provide information related to quality requirements, volume and standards of products to ensure its supply at the right time on sustainable basis. To realize this, processing companies need to be encouraged and supported to work and linked with the regular extension institutions, farmers' groups, and cooperatives through various means such as by establishing contract farming, out growers' schemes and conducting training programs. Similarly, input supply companies need to promote their products through establishing strong linkage with key stakeholders and undertaking of field level demonstration, popularization to create massive demands among farmers.

3.4 Pillar 4: Facilitate market linkage and enhance value chains development

Objective: To transform subsistence farming to commercialized farming system through the implementation of value chain approach that promotes market-oriented extension services in various agro-ecologies.

Current extension services typically focus on promotion of improved technologies and good agricultural practices to increase production and productivity of farmers without giving due consideration to value addition and marketing. However, increasing production does not necessarily reward farmers with better income unless it is embedded in a holistic value chain that is sustainably linked to markets. A value chain can be defined as the full range of activities that are required to bring a product or service from conception, through different phases of production (involving a combination of physical transformation and the input of various producer services) delivery to final customers and disposal after use (Kaplinsky and Morris, 2002). A value chain brings together all key players collaborating vertically and horizontally to increase return on investment in agriculture along the production to consumption continuum. The agricultural value chain framework is increasingly used by development projects and/or programs that intend to engage smallholders individually or collectively in the production of high value commodities (Gebremedhin, *et al.*, 2012). Promotion of value chain-based extension services has faced several bottlenecks in Ethiopia.

Bottleneck 3.4.1: Insufficient understanding of market-oriented production system

Market-oriented production system has its own unique activities which need to be known and well implemented by all technical staff and other development actors at various levels for the provision of effective market-oriented extension services. The concept of market-oriented production system has been introduced to the Ethiopian agricultural extension system since a long time ago. However, its practical implementation has been challenged by the limited capacity of technical staff, insufficient awareness on market oriented extension services at various levels, and poor infrastructure for the provision of effective market information.

Bottleneck 3.4.2: Limited focus on strategic commodities in the extension services

Although there has been a desire to change subsistence to commercial farming, there have not been appropriate approaches to select and promote the most important strategic commodities/value chains in the extension system. The efforts largely focused on producing surplus food crops through improved productivity without creating the required link to markets. Effective value chain development and market linkages require a concerted effort of different actors such as input suppliers, producers, traders, transporters, processors, and consumers that needs the support of the extension service. Each of these actors has worked independently and often times in a competitive rather than a complementary sprit that made farmers the eventual victims.

Bottleneck 3.4.3: Limited knowledge and skills of extension staff to facilitate value chain development

Frontline extension staff usually focus on promoting the use of improved technologies and practices to increase production and productivity through various extension communication methods like demonstrations, field days, group meetings and through on farm and home visits. This is partly due to their training orientation to pushing technologies than being market-oriented. In addition, they have very limited knowledge and skills on concepts of value chain development, marketing and marketing functions and facilitation skills to build businesses and create business relations among the market actors. Because of these gaps, the provision of extension service remains production focused.

Bottleneck 3.4.4: Ineffective linkage among value chain actors

Poor linkages and lack of trust among value-chain actors including input suppliers, producers, processing firms and exporters and other supporters undermine development of a value chain approach. Agricultural Development Partners' Linkage Advisory Councils (ADPLAC) was established to improve the linkage and collaborations among the stakeholders in the extension service. However, it is observed that this approach has not been functioning well and has not focused on specific value chain commodities as a means of solving strategic problems along the value chain, from input supply to consumption. This has been in part driven by poor participation of private actors in the ADPLAC forums.

Bottleneck 3.4.5: Limited access to market information and collective marketing

Farmers need different kinds of information to make informed decisions on their agricultural activities and product types. Farmers have information on increasing the quantity of a product, but not on the quality requirements of consumers, processing firms and export markets, which is mainly caused by inadequate value chain approach. There is also poor coordination among the concerned institutions and offices in the provision of market information. This leads to the production of low quality products and low prices, and hence low benefits to farmers. Moreover, mostly farmers sell their products individually at the spot and farm gate market that limits their bargaining power and decrease profit margin.

Key proposed strategic interventions

Intervention: 3.4.1: Build the capacity of the technical staff at various levels to provide market-oriented extension services

To implement effective market-oriented extension services in a successful way, it is important for the technical staff at various levels to have basic knowledge on the basic principles of agricultural market, marketing, and agribusiness, among others. This will enable the extension personnel to effectively discharge their responsibilities to deliver and promote market-oriented agricultural extension services. It is therefore imperative to organize and implement national level market oriented extension capacity building programs for technical staff at various levels. This needs to be augmented by incorporating value chain and marketing courses in ATVETs training and undertaking regular workshops at various levels to create the necessary awareness.In market oriented extension approach, the extension staff is expected to play the following roles and responsibilities.

- Provide specialized and focused training and advisory services on selected agricultural commodities/value chains, including pre- and post- harvest handling and market access to DAs and other extension workers working on value chain;
- Assist farmers to access market information including prices, quality requirements of markets, etc. This will be achieved through motivating and supporting the private agro-processing industries and input suppliers to work with the public extension;
- Facilitate formation of farmers groups and development based on value chains for group learning, value addition, and collective marketing. The commodity based farmers groups will be linked to cooperatives, processing enterprises and agro dealers to access inputs, information on quality requirements, advisory and training services.;
- Facilitate linkages among the various operators and other stakeholders who are involved in selected value chains.; and
- Provide advisory services and trainings to smallholder farmers to become value chain and business- oriented.
- Ensure enabling environment for market actors to develop concrete business-to-business relationships.

Intervention: 3.4.2: Promote Value Chain-Based Extension Services

To move from production focus to sustainable market-oriented extension services, a value chain approach that focuses on selected strategic commodities in different agro-ecologies or geographies should be adopted as a strategy. This enables to provide effective and efficient extension service on specific strategic commodities/ value chains related to productivity, market quality requirements, and facilitation of market linkages. Value chain commodities could be identified based on the importance to the economy in addressing food security and poverty reduction, local and export market demand, increase income, and competitiveness.

Intervention: 3.4.3: Enhance Capacity Development of the actors

Adopting a value chain development approach requires a shift from production focus to value-chain focus through changing the orientation and capacity of the extension staff and other actors at all levels. Some of the capacity building interventions to be considered are:

- Revisiting the institutional arrangement and gaps of the public extension and research institutions to be able to provide a coordinated support to selected value chain commodities.

- Inclusion of value chain development and agricultural marketing subjects in the curricula of ATVETs and HLIs.
- Provision of in-service practical training to all extension workers to develop their capacity and skills on marketing and value chain.
- Strengthening the private sector and cooperatives and unions to sustain input and output marketing linkages with smallholder farmers.
- Developing the capacities of sector/value chain commodity associations for them to be able to provide services to members in a sustainable way and be recognized by other stakeholders.

Intervention: 3.4.4: Promote value chain-based linkage development

The basic characteristic of a value chain development is market-focused collaboration for different business enterprises to work together to produce and market products and services in an effective and efficient way. Thus, creation of linkage platforms based on a particular value chain commodity like honey platforms, dairy Platforms, wheat platforms, ACC platforms …etc. Such specific platforms are vital to promote dialogue, enhance learning, decision making and collective action and to develop partnerships and strengthen relationships among the actors. These actors can be identified as value chain actors and value chain supporters.

Value chain actors are those who take ownership of a product through the exchange of money or equivalent goods or services during the transaction process as the product moves from conception to end users. On the other hand, individuals, institutions, or firms providing a service without taking ownership of the product are classified as service providers or value chain supporters. Value chain supporters are essential for value chain development and they include providers of sector-specific input and equipment, financial services, business management services, market information and technology, and advisory services, etc.

Value chain-based platforms can be organized at national and regional levels. Formation of regional level platforms will be carried out depending upon the production potential of the regions. Government will take the lead role for the coordination of the platforms. However, there is also a possibility to give the coordination responsibilities to leading processing and export companies and sector associations. For instance, beekeeping association is currently organizing multi-stakeholder platforms for honey value chain at national and regional levels with support of projects.

Interventions: 3.4.5: Improve Access to Market Information and Collective Marketing

Provision of market information at the right time to the right people in the right way is critical to strengthen the partnership among the value chains to make decisions. Market information includes type and quality of products, their reliable sources and prices, inputs and their prices, quality and quantity requirements of agro-processing industries and consumers, demand and supply trends, and weather forecast. Thus, there is a need to implement a well-organized and consistent marketing information supply system to smallholder farmers. Moreover, the extension services needto encourage and support collective marketing to improve the bargain power of farmers and to supply the desired quality and volume of products that creates sustainable market linkages with processors and exporters. Support to establish market infrastructures such as improved warehouses and ICT that enhance collective marketing and the flow of marketing informationis critical.

Box 4: Success story on Private processer as extension service provider

Previous reviews have shown that there were few extension experiences made to link producers to processing firms. As indicated in the extension assessment report of SNV (SNV, 2013), Dashen Malt Factory located in Gondar town has started working with the public extension staff to promote malt barely production in Woredas that have good potential for its production. The factory participated in extension services by way of providing training and information to farmers and extension workers on quality standards and requirements of the factory and the necessary packages. In addition, the factory has assisted farmers to access improved quality seed and to facilitate collective marketing by creating linkages with farmers' cooperatives and unions.

3.5 Pillar 5: Gender, youth and nutrition mainstreaming

Objective: To mainstream gender and nutrition issues in the broader agricultural extension programs and ensures women and youth have equal access to agricultural extension services.

Many studies in indicate that women in Ethiopia contribute between 40-60% of labor to agricultural production. Despite this, women face unique constraints that reduce their productivitypotential. On average, femaleEthiopian farmers produce 23% less per hectare than their male counterparts (ATA, 2015). The productivity gap can be attributed to the inability of women to access necessary agriculturaltraining, inputs, and services.

To increase agricultural productivity and efficiency, agender-sensitive approach is needed in the provision of extension services. The government has recognized gender mainstreaming as an approach to be used in all agricultural development programs to address the gaps related to development inequality for both male and female. Unfortunately, in many cases the policy commitment has not been reflected in practice because of the following key bottlenecks.

Bottleneck 3.5.1: Poor gender and youth mainstreaming in extension programs planning, implementation and in monitoring, learning and evaluation

Gender and youth mainstreaming suffer from a crude understanding of the policy and its objectives. Frequently generic rather than context-specific interventions to address gender and youth issues are identified for implementation. Extension personnel do not always have a clear understanding of the challenges and opportunities unique to women and youth. This is leading to difficultyin measuring progress in addressing gender equality and participation of youth. Despite the contribution of women to agricultural development, they are under-represented in planning and implementation of agricultural programs. Similarly, due to land shortage and poor access to agricultural information, rural youth are not often participated in extension program planning, implementation and evaluation.

A recent gender audit of the Regional Bureaus of Agriculture suggested that trainings focused on gender have done little to address the problem. The problem has been further aggravated by misuse of gender mainstreaming guidelines to support day-to-day operations. The extent gender mainstreaming is taken into account in developing plansin the agriculture sector is usually limited to the simplistic level of counting number of male and female farmers without clearly articulating the objectives for addressing gender issues and how the objectives can be achieved through detailed activities. Without the articulation of detailed activities to address gender issues, the effort to mainstream gender based activities in extension program will remain unaddressed or will be given little attention in planning, implementation, monitoring, learning, and evaluation (MLE).

Bottleneck 3.5.2: Shortage of gender disaggregated data

Shortage of data disaggregated by sex and age undermines the ability to specifically identify gender-related problems and accordingly design solutions. Similarly, women as well as youth are often not used as key informants during qualitative studies and problem identifications, although some recent improvements have been noticed in this area.

Bottleneck 3.5.3: Socio-cultural constraints

A great majority of women does not participate in decision-making or express their needs during meetings because of prevailing socio-cultural barriers that elevate the role of males in such forums. For instance, in most cases, women and youth are not invited to attend meetings and social discussions that concern women and youth with assumptions that men can convey the message to them. Since the messages are not conveyed as desired due to information distortion, often women and youth do not know what is happening related to gender both at Woredaand kebele levels. Even if, the message is thought to be conveyed through male farmers, information is not consistently communicated to all women farmers due to the perception that women are not farmers; hence, the message is not important to them.

Low levels of literacy and limited exposure of women to information and support by development practitioners also contribute to the problem. As a result, women and youth are unable to exercise their rights during program designs and implementations, which in turn result in methodological biases and gap in content design.

Bottleneck 3.5.4: Inadequate nutrition sensitive extension service

Malnutrition prevalence is very high in Ethiopia. About 32% of the populations are considered undernourished. Diet diversification as well as micronutrient availability is relatively low (Global Food Security Index, 2016). This is due to lack of nutrition-sensitive farming system. Diversifications and intensification of agriculture play a central role in meeting food and nutrition security in Ethiopia. However, the public extension service on nutrition issues is negligible and major public policies and the attention of extension system is focuses on cereal crop production to bring food security (MoFED, 2010). Moreover, cultural and societal norms in rural areas often create considerable negative impacts on the nutritional status of women and children, making them vulnerable social groups (Workneh, 2008).

Key proposed strategic interventions

Intervention 3.5.1a: Enhance the level of awareness on gender at all levels

The current low level of awareness about gender needs to change at all levels. The importance of gender in development must be seen as a top priority in Ethiopia's move to modernization. The following interventions are suggested to enhance the level of awareness at all levels.

For service provider

National focus and continued support to improve awareness levels of top-level officials, experts, and DAs on gender mainstreaming. All agricultural extension staff needs to ensure mainstreaming of gender thereby setting clear targets vis-a-vis national targets for married women as well as for female-headed households.

Community

Improve women and youth participation among the rural communities through awareness creation and providing important information on social and economic issues. There is also a need to increase the number of female and youth farmers in agricultural programs by ensuring equal access to agricultural extension services and benefits; and increase awareness on women's rights and abuses that can lead to other social problems (HIV/AIDS, female genital mutilation, and abduction) via training and campaign in ATVETs, FTCs,schools, and community-based organizations, including 'Edir'.

Intervention 3.5.1b: Strengthen gender mainstreaming actions

Gender mainstreaming can be strengthened through the following methods and approaches:

- **Support and promote gender-sensitive actions:** Policiesand strategies undertake practical initiatives that address gender issues and proactively work to preventing discrimination and acts of violence based on gender at all levels. This requires setting of clear activities, targets, and indicators to measure gender outputs and outcomes in the process of gender mainstreaming practices;
- **Capacity building for extension staff on gender mainstreaming:** Considering the current gap, improving the knowledge and skill of extension staff on gender mainstreaming becomes critical. Therefore, building the capacity and capability of the staff on topics such as gender analysis tools, strategies, and approach on how to streamline gender issues in the entire process of extension service delivery are needed.; and
- **Assign focal person at all levels:** A gender focal person (FP) needs to be assigned in each organization at all levels to coordinate and ensure gender issues are mainstreamed.

Interventions 3.5.1c: Enhance the participation of women and youth in agricultural extension

The majority of women and youth in Ethiopia do not have an opportunity to participate on activities that affect their lives, in particular in extension services. Real participation in the extension services can be addressed through establishing and strengthening different women and youth groups. Apart from improving participation, these groups will facilitate information, experience exchange, and enhance peer to-peer learning. Male and female role models approach can also be used as a promoter of enhancing participation through sharing their experiences on the benefits of extension services. Moreover, women friendly agricultural technologies that reduce their workload and enhance income needs to be identified, promoted and disseminated through the extension system. Special support will be provided to women and youth groups through different capacity building strategies so as to improve their knowledge and skill to be engaged in income generating activities including off-farm activities.

Intervention 3.5.2a: Establish and strengthen linkages, network within, and other sectors

Women and youth need a broader set of demand-led supports and services in addition to technical information. There is a strong need for integration, coordination, and convergence of efforts of the different stakeholders/line ministries within the sector & other GOs, NGOs, associations, donors, unions, women, and youth groups at all levels. This will enhance the provision of technical, managerial, organizational, entrepreneurial, and social support to women, men and youth. Particularly, the synergies between the agricultural extension and health extension becoming important to minimize the existing gaps between the two organizations related to the provision of nutrition sensitive agriculture and extension services.

There is a need to strengthen the link and integration between Women Affairs Directorate, Agricultural Extension Directorate within the MoANR and other agricultural sectors needs to be strengthened for complementary effects, and for strengthening accountability mechanisms. The convergence generally helps develop common vision, goals, and successful implementation of priority activities in gender. Among others, the synergy can be strengthened through the following methods.

- Joint problem identification, priority setting and implementation;
- Shared resources and skills;
- Establishing gender debate on a monthly or a quarterly basis.;
- Exchange of reports and information;
- Include gender impact assessment within the directorates in MoANR for approval of programs and projects; and
- Put in place a joint MLE system and accountability and responsibility mechanisms.

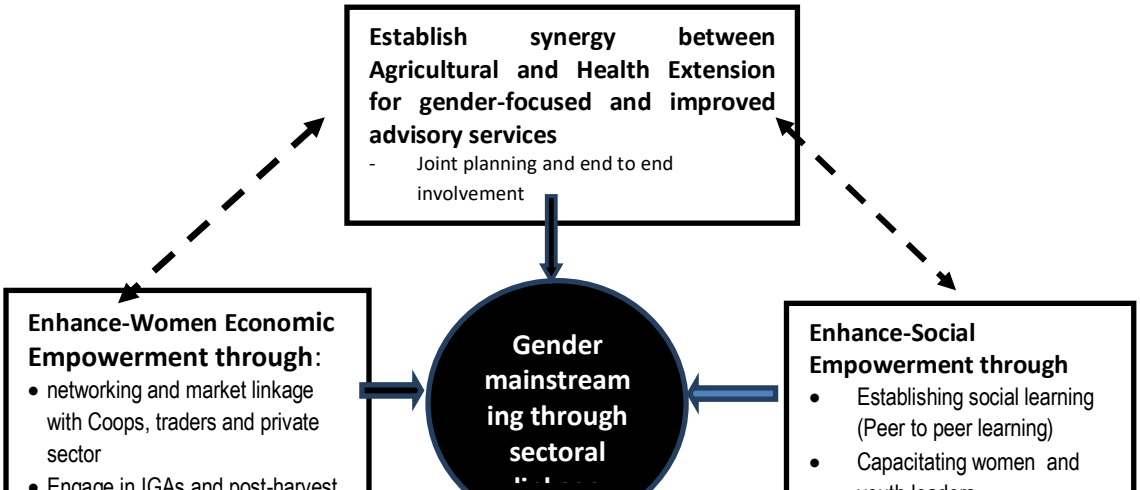

Figure 4: Example for cross sectorial synergy for gender mainstreaming

Intervention 3.5.2b: ***Allocate adequate resources to gender and youth related activities***

The allocation of sufficient resources including budget is needed for successful implementation of gender specific program related to extension. These resources mainly used for building the capacity of women and youth in extension services that promote and implement income generating and job creation activities for self-help support.

Intervention 3.5.3: Enhance women's socio-economic empowerment

Effective economic empowerment for women occurs when women enjoy their rights to control and benefit from resources, assets, income and their own time and have the right to manage risk and improve their economic status and wellbeing. In connection with this, much is expected from all practitioners to aggressively and proactively help women's lives to transform from a situation where they have limited power to a situation where their power is equal to that of men. Women's economic empowerment can be enhanced through the following means

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- Map out key activities for economic empowerment of women and youths;.
- Initiate and promote both on-farm and off-farm income generating micro-enterprises, for example, women economic empowerment via vegetable production, sheep and goats fattening, poultry production, beekeeping, raising seedlings, handicrafts "processing" trading, and promoting environment friendly technologies; and
- Establish gender working groups: Priority should be given to those individuals who come together voluntarily since they will have then a greater chance of working together in groups and support each other in the process of implementing the designed activities.

Intervention 3.5.4: Promoting nutrition sensitive extension service

Diversification and intensification of crops and livestock productions offer a strong pathway to nutrition security. Integrating different crops (e.g. vegetables) and animal source foods (e.g. poultry andfish) into farming systems appears to be increasing nutrition security, diversifying and intensifying agriculture. Thus, there is a need to reshape the current production system into a more nutrition-diversified system by mainstreaming nutrition issues in the agricultural extension system. In addition, there is a need to ensure and promote the access and consumption of variety, safe and nutrition food in the extension service provision. Therefore, extension service provision should give emphasis towards improving the awareness, knowledge, skill, and attitude on the production, preparation, and consumption of nutrition sensitive diet.

3.6 Pillar 6: Enhance environmentally sustainable agricultural practices

Objective: To integrate environment, natural resources management and sustainability issues into agricultural extension services

Economy, environment, and society are the three major interconnected drivers of sustainable development (Giddings et al., 2002). Building harmony between them is of paramount importance in order to bring sustainable development. Sustainable natural resources management is positively influence environmental quality, sustainability and agricultural production and productivity. The expansion of agricultural land because of rapid population growth has aggravated environmental deterioration in Ethiopia. Moreover, inappropriate utilization of natural resources leads to severe moisture loss, continuous degradation of fertile soil, loss of vegetative cover and biodiversity and subsequently to a decline in agricultural production and productivity. Types of farming practices also affect the environment and other natural resources in many different ways. In this strategy, the following major environmental sustainability bottlenecks have been identified and key interventions are proposed.

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Bottleneck 3.6.1: Poor link of natural resource management extension services with livelihood strategies

In the last four decades, tremendous efforts and large investment have been made including through community mobilization or campaign to conserve natural resources across the country. These efforts have resulted in remarkable achievements new recently for example, in watershed management, soil and water conservation (SWC) and afforestation, which can be exemplary for other countries. However, absence of land use plan, lack of sense of ownership by the local community, lack of genuine participation, poor maintenance, etc. have contributed to the low adoption of natural resource practices. This is because the current natural resource activities are poorly linked with livelihood strategies and consequently the practices are not sustainable.

Bottleneck 3.6.2: Limited capacity on environment and natural resource management

Natural resource management needs a specialized knowledge and expertise at all levels. However, from grassroots level evidence and continued deterioration of natural resource, one can suggest that there is a limited capacity and knowledge on NRM by development practitioners working in the sectors in particular by DAs and farmers. Much of the trainings implemented by NRM focus on the technical content of the NRM and they lack extension methodologies and approaches to bring necessary behavioral changes of the farming communities.

Biophysical SWC, as one key activity of natural resource management, requires its own technical specification and standards, which needs highly calibrated professionals. If natural resource management practices are poorly implemented, they aggravate further degradation. Thus, special attention should be given to equip the staff with detail knowledge and skills of natural resource management.

Bottleneck 3.6.3: Low access to and use of climate smart agricultural technologies and agro-metrological Information

Climate change and its impact on environment, economies and food security is the crucial issue in Ethiopia. The smallholder farmers of Ethiopia are the most vulnerable to the impacts of climate change. This is because they are dependence on the natural environment for their livelihood and lacks the means to cope up with the impacts of climate change. Drought usually occurs as a result of climate change, which in turn, negatively affecting crop and livestock production. However, the extension system is not in position to promote climate smart agriculture and agro-metrological information to smallholder farmers.

Bottleneck 3.6.4. Less attention to environment sustainability in the extension advisory service

Despite high performances in terms of agricultural productivity growth, agricultural development in Ethiopia remains constrained by many issues of environmental sustainability. High priority is given to short-term food security and agricultural productivity and consequently the extension system is not sustainable-oriented. In addition, current farming practices in Ethiopian smallholder agriculture are generally not sustainable but rather extractive resulting in significant impacts on the physical environmental, which in turn constrains long-term agricultural growth.

Agricultural unsustainable practices in Ethiopia includes encroachment of farming into higher elevations and steep slopes and farming of slopes without conservation measures; cereal mono-cropping; continuous farming

and removal of crop/livestock residues (stalk, roots, manure, etc.) for various purposes; deforestation, overgrazing; limited use of renewable energy in mechanized farming and irrigation functions; and excessive/inappropriate tillage as well as inappropriate use of inputs. In general, any attempt to increase agricultural production without considering the costs to and degradation of natural resources is unsustainable.

Key proposed strategic interventions

Interventions 3.6.1: Enhance NRM extension services link with livelihood strategies

In order to improve the NRM and minimize the current threat, the recent attention given by the government in extension services must be continued in well-coordinated and system-based approach by linking with livelihoods strategies. Among others, the followings need key attention in the extension services.

- Enhance physical conservation on natural resources through improving advisory services by implementing soil bunds, stone-faced soil bund, *Fanyajuu*, terracing, gully control and rehabilitation …etc; and
- Promote biological conservation measures by improving agronomic practices, stabilization of the physical structure, minimum tillage, agro-forestry etc.

The activities mentioned above should be done in collaboration with local communities and development practitioners (NGOs). Concerned Directorates within MoANR at various levels need to work together to ensure alignment of their natural resource activities and provide multi-disciplinary extension service to the farming community.

Intervention 3.6.2: Improve technical capacity of extension staff on NRM

Improve NRM knowledge and skill of extension workers and farmers are of paramount importance to facilitate the natural resource investments and environmental management. This can be done through organizing short and long-term training programs specific to natural resource management. Such training must be organized and given by professionals who have rich experiences in the subject through linking with universities, ATVETs, and colleges. In addition, there is a need to prepare NRM-based extension guidelines, brochures, and leaflets in different local languages that clearly demonstrate the benefits as well as all necessary practices for proper natural resources management. As part of capacity building and motivation, provide recognition and awards for key players on NRM for their outstanding performance and visible contributions are important.

Intervention 3.6.3: Promotion of climate smart agriculture and agro-metrology information

The agricultural extension system has a great contribution to adapt and mitigate the current climate change problems through promotion of appropriate practices and information. The following interventions are suggested to adapt and mitigate the problem related to climate change.

a. Promote climate smart agriculture such as:

- **Improved crop management**: This includes minimum tillage (where appropriate), contour tillage, raw planting, intercropping , crop rotations, cover cropping, improved seed varieties (stress-resistant varieties), mulching, double cropping, crop diversity, and integrated pest management, push-pull technologies, improved storage and processing techniques;
- **Improved livestock management**: This includes better breeds (artificial insemination and cross-breeds), improved forage technologies (new grass & legumes varieties, cut and carry, rotational grazing, and area closure), and improved veterinary services, animal husbandry improvements, destocking, improved grazing capacity of grazing land, rangeland management;
- **Improved Soil and water conservation practices**: This includes activities like, soil test-based fertilizer application, use of compost & manure, Broad Bed Maker (BBM) (to drain excess water in vertisols), green manure, residual management, bio-fertilizer, lime application, integrated nutrient and soil management, physical and biological soil conservation methods, contour planting, agro-forestry, integrated watershed management;
- **Irrigation water use & Irrigation practice:** This includes Spate Irrigation, Water Harvesting Pits, Supplementary Irrigation, Drip Irrigation, Sprinkler Irrigation, Deficit Irrigation, Alternative Furrow Irrigation, Pitcher Irrigation, Irrigation, Scheduling, Groundwater Restoration, Sediment/Silt Trapping; and

- **Energy use**: This includes Biogas, Improved stoves, Renewable energy (solar, wind)

b. Increased access to and use of agro-metrological information: This can be through promoting FTCs based agro-metrology information and building the capacity of extension staff on agro-met.

Intervention 3.6.4: Enhance environmentally sustainable oriented extension service

Promote changes in farming practices towards greater conservation and efficiency in use of natural resources are of paramount importance to bring sustainable development. In line with this, extension service needs to integrate environmental sustainability issues in the overall agricultural development interventions. This enables to ensure agricultural growth and enhanced incomes of smallholder farmers in a socially acceptable and equitable manner while protecting and improving the natural resource base. In order to promote sustainable agricultural practices in the extension system, the following interventions are suggested.

- Prepare extension package for sustainable practices in collaboration with concerned stakeholders;
- Train in sustainability indicators for all experts and DA in extension system;
- Create curriculum on sustainability issues in higher learning institute and ATVET;
- Raise farmers' awareness and understanding of the potential benefits of sustainable agriculture practices.; and,
- Institutionalize climate smart and sustainable agriculture

3.7 Pillar 7: Enhanceinstitutional arrangements, coordination and linkages among key agricultural development partners

Objective: To strengthen and establish effective linkage forums at all levels to create strong alliance for better extension and advisory services.

Building a sustainable framework for strong collaborations and working relations in agricultural development is critical. With this principle, agricultural development partners' linkage advisory council (ADPLAC)was established in 2008 that evolved from research-extension liaison committee (RELC) and research-extension-farmers advisory council (REFAC) to accommodate all development actors at various levels from Federal to Woredas (Figure 5).

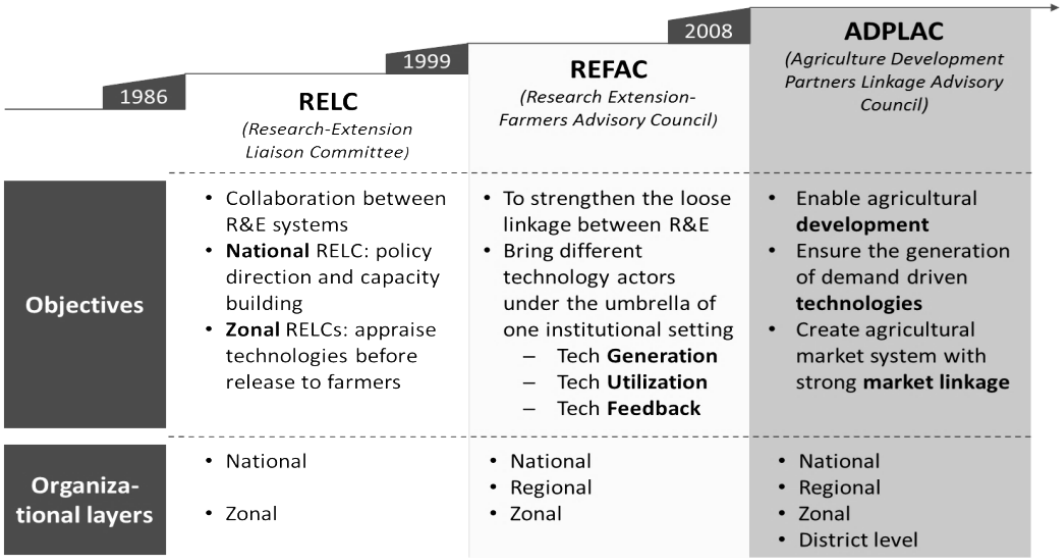


Figure 5: Evolution of ADPLAC (Source: ATA Analysis)

ADPLAC has made significant efforts in bringing all actors working on agricultural development to one platform and building new collaborations, enhancing new culture of working and developing, encouraging demand- driven agricultural research system for more impact. In this process, ADPLAC has also contributed in shifting the research agenda towardsfarmers'frame of reference through joint identification of systemicproblems that hinder agricultural development. The decision made by ADPLACat various meetings has generally contributed to harnessing effective involvement of key actors and addressing some of the issues that had not been well addressed before. For instance, through ADPLAC a renewed focus has been placed on livestock, NRM, market, seed system, and agro-industry. Nevertheless, the following key bottlenecks were hindered ADPLAC to fully function and bring greater impact

Bottleneck 3.7.1: Lack of vibrant linkage and poor coordination

Despite many attempts made to create strong linkages between research and extension in the past many years, effective linkage and coordination have been lacking at all levels in the process of technology generation, validation and adoption. ADPLACat the time of its establishment had good motivation and sprit to engage in agricultural development regularly. However, this momentum gradually lost and became inconsistent. As a result, issues which are challenging toagricultural development and are critically affecting the success of extension services such as input supply, human resource development in agriculture, access to financial services, marketing and market infrastructure development, overall directions in agricultural technology generation, dissemination and utilization remain unsolved. Moreover, the platforms lack to have their own regular budget from government to run their activities.

Bottleneck 3.7.2: Lack of coordination and communication between agricultural sectors and HLIs/ATVETs

The existence of limited communication between the agricultural sector and HLIs has contributed for poor development of human resources for agricultural sector. Moreover, poor coordination, lack of joint planning process, poor alignment between the identification of required human resources and curriculum development has exacerbated the problem. The curriculum is also sometimes seen from the academic point of view rather than equally considering the current gaps and demands in the agriculture sector. As a result, there is a mismatch between demand and supply in skilled work force for agricultural development.

Bottleneck 3.7.3: Weak responsibility and accountability in linkage platform

In most cases, ADPLAC and other linkage platforms established by different organizations have not been effective as expected to be due to various reasons (poor commitment, accountability, lack of sustainable resources,…etcExcept for planning's meeting held every year, the supervision and monitoring of ADPLAC hasalso realized to be weak. Additionally, insufficient assigning of dedicated focal persons for ADPLAC within organizations has aggravated the problem. In areas where focal persons are assigned, they are neither empowered nor are they sufficiently familiar with their responsibilities.

Key proposed strategic intervention

Intervention 3.7.1a: Review and develop linkage forum guideline

Improving the awareness levels of stakeholders on the advantages of ADPLAC/platforms and overall contribution to agricultural development is important. Awareness and interest can be raised by revitalizing and restructuring the system to a manageable size, and making the system focus on specific rather than general issues to come up with appropriate recommendations. This can be achieved through restructuring ADPLAC into thematic focused platforms and sub-platforms. In addition, preparing newsletters on quarterly bases to update the progress of the platforms, share experiences, and implement the annual plan is recommended. Organizing panel discussions through mass media on the achievement and success stories as well as limitations of the ADPLAC can help to create massive awareness. This will lead to a shared vision and common understanding on the working modality of ADPLAC. It is also essential to review and update ADPLAC working guidelines in accordance with existing situations and demands from Africa Forum for Agricultural Advisory Services-Country Forum (AFAAS-CF) to strengthen and improve ADPLAC's financial capacity.

Intervention 3.7.1b: Creation of sustainability in the institutional arrangements for improved linkage forums

The current arrangement of the ADPLAC needs to be re-organized in a way that makes the system function properly and efficiently. ADPLAC needs to be managed by responsible and accountable unit that can also be governed by a general assembly of key stakeholders. ADPLAC and other linkage platforms can be financed in various ways, including through government fund support, raising funds, membership fees, contributions and members financing own participation. They will perform innovative activities that foster interaction among members but at the same time generate resources to finance forum activities such as organizing technology fairs, offering specialized trainings, knowledge management functions, agricultural publications, organizing conferences, and policy dialogues. To make ADPLAC more effective and efficient, it is also important to institutionalize it at different levels (including budget and human resources).

Intervention 3.7.2: Strengthen stakeholders' collaboration and networking

Partnership, collaboration, and networking among research, extension service providers and other stakeholders need to be strengthened in the process of problem identification, technology generation, validation and dissemination. It is also important to establish and harmonize the stakeholders working collaboratively at all levels for joint program planning and implementation, information sharing, impact assessment and capacity building with the focus on facilitation and communication skills. In addition, it is also necessary to capacitate ADPLAC at various levels by establishing and using website.

Another important coordination strategy is the setting up of coordination office whose role is to facilitate the establishment, maintenance and strengthening of linkages among various actors in the agricultural system (research, extension and farmers). Such platforms can be designed to analyze the existing research, extension system through setting priorities for extension intervention and facilitating the designing and implementation of jointresearch extension programs by involving several service providers

Box 5: Success story of ADPLAC on the introduction and adoption of haricot beans and onion seed multiplication and utilization

Ethiopia has a high potential for growing different pulses such as haricot beans and vegetables such as onions. In order to improve the productivity and production of haricot beans, Melkasa Agricultural Research Centre (MARC), as a national coordinator for haricot beans research, released a number of improved haricot bean varieties. However, farmers did not adopt the improved varieties due to lack of linkage to a reliable market. Soon after the establishment of a Zonal level ADPLAC, farmers started to see the benefits of a complete platform established along the value chains linking producers to local and international markets. Community seed multiplication schemes were established and became a source of improved seed for farmers. As a result, haricot bean improved varieties gained popularity in most parts of the Rift valley and other parts of the country. Since then, the production of beans has become a remarkable source of income for farmers, traders and contributed to the growth of the country's economy earning it the nickname 'white gold'.

In a similar story, shortage of onion seed had been identified as an important problem in the country. There were no private and public sector multipliers of onion seed. As a result, bulk onion seed was imported from outside at high prices, putting a high demand on foreign currency. MARC, as a national coordinator for onion research, had developed onion varieties but they were not disseminated to farmers due to shortage of onion seeds. Meanwhile ADPLAC appeared to multiply and disseminate onion seed. Similar to haricot beans, community based onion seed production was established and has been linked to market since then.

In general, ADPLAC has gained great success in the promotion, dissemination, and adoption of haricot beans and onions because of the following factors:

- High level motivation and commitment of the Council in that area;
- Presence of agricultural research centers and farmers representatives in the Council;
- Inclusion of key development partners and continuous follow-up to ensure their contributions;
- Recognizing members' contribution on the Council's meeting;
- Monitoring and close follow-up of decisions made by ADPLAC; and
- Regular communication between concerned bodies.

3.8 Pillar 8: Human resource development and utilization for effective extension service delivery

Objective : To improve the efficiency and effectiveness of the extension personnel at different levels for diverse, demand-driven and market-oriented extension services

One of the major challenges in the agricultural sector is limited competent, well trained, andhighly calibrated extension staff at all levels. The human resource capacity development will need to pursue the complex and dynamic agricultural development demands. In addition, short and long-term trainings are required to update and upgrade the skill and knowledge the existing staff to achieve the goal of agricultural transformation plan. The following key bottlenecks have affected the development of human resource development and utilization in agricultural extension system.

Bottleneck 3.8.1: Limited demand based training at HLIs and ATVETs

The contribution of HLIs andATVETs in producing skilled manpower is important for creating strong extension system. Currently the number of HLIs & ATVETsdealing with the provision of agriculture-related training in different parts of the country is increasing. However, communication between the agricultural sector and HLIs is poor. This is due to lack of coordination and joint planning both during the identification of human resources required for the agriculture sector and curriculum development. In addition, research and extension institutions don't have their own short and long-term human resource development plan to meet the dynamic nature of agricultural development. As a result, there is a mismatch between demand and supply in skilled manpower development in agricultural sector. The curriculum is also sometimes seen from the academic point of view rather than equally considering the current gaps and emerging issues such as agricultural risks management (ARM), and others.

In many cases, the trained human power has inadequate knowledge and technical skills. In most cases, the training offered is not outcome-based nor does it address the workplace requirement in different organizations. At ATVETs, even though the curriculum was designed to encompass 70% practical, skill training, and the remaining 30% theory, this has not been fully implemented. As a result, most graduates, especially DAs, lack practical skills to train/support farmers in improving practices on the ground.

Bottleneck 3.8.2: Poor staffing and high staff turnover

The current extension services at various levels are challenged with high shortage of staff. The workload has increased to meet the current development goal and enhance agricultural transformation, but the number of skilled human power has not increased correspondingly. As a result, inadequate staff at various levels is reportedly to be one of the critical problems affecting the quality of the extension services. High staff turnover due to poor handling, low incentive and payment system and inadequate facilities exacerbated the problem.

Bottleneck 3.8.3: Lack of clear chain of command

Information collected from different Woredas indicates that there is no well-defined line of chain, leading to poor flow of information and lack of accountability. For example, DAs are accountable to both Woreda Administration and the Woreda Agricultural Development Office (WoADO). Being accountable to multiple institutions makes it difficult for DAs to prioritize tasks and may lead to over-stretching and hence to under-performance. As a result, the DAs fail to meet the requirements of either institution.

In addition, tobring a tangible impact on the livelihoods of the communities and on overall economic agricultural professionals should also lead growth of the country, the sector at all levels with clear line of command. Although, recently some changes are realized, leaders of agricultural development mainly in few Woredas are reported to be managed by non-agricultural professionals. This has resulted in misunderstanding between the professionals (experts) and non-agricultural professional leaders, inappropriate and delay of decision, poor coordination and high professional staff turnover. Moreover, the engagement of DAs in non-agricultural extension activities /multi-tasking/ has critically affected their regular extension works.

Key proposed strategic intervention

Intervention 3.8.1: Promote and implement need based professional training at HLIs& ATVETs

To ensure the training provided by HLIs and ATVETs is demand-driven and practical oriented, it is essential to integrate HLIs and ATVETs with the extension and research system human resource development plan. Thus, the following interventions are recommended.

- **Improve synergies and alignment between extension service providers with HLIs&ATVETs:** The training and human resources development by the HLIs and ATVETs should be based on emerging development demands in each sector and in relation to dynamic changes taking place within the agriculture development. This requires a well-articulated curriculum development and capacity-building plan in consultation with all concerned actors and the leadership of the national extension system. In the curriculum development and training provision shall be given due attention to the following thematic areas. These includes but not limited to, agricultural risk management (ARM), climate change and climate smart agriculture (CSA), nutrition, gender, value chain development and marketing, communication and facilitation as these are overlooked in the past interventions;
- **Implement outcome-based training system:** HLIs and ATVETs should adopt outcome-based approaches and regularly assess the professional competency of its graduates through external reviews;
- **Improve communication and working relationship:**Communications and work relations can be improved through joint problem identification, planning, and implementation. Establishing a network through web-based system such as agricultural portal to exchange up-to-date information, establishing tracking system for trained staff, establishing annual platforms for experience sharing and inviting the agriculture sector for policy briefs to the HLIs are some of the proposed actions to improve communication and working relationships in agricultural extension between HLIs, ATVETs and extension service providers; and
- **On the-job-training:** Extension workers should obtain relevant knowledge and skills through in-service and on-the-job training. To facilitate this, a collaborative framework needs to be established between the nation's extension system, HLIs, and ATVETs.

Intervention 3.8.2: Enhance staff motivation and retention

Currently, the agricultural sector has shown dynamic growth and demands high skilled work force at different levels. However, shortage of staff is reported to be one of the critical factors challenging the sector. This is mainly due to high staff turnover. Therefore, the following measures shall be taken to motivate and retain the extension staff at all levels.

- Clear and effective guideline on staff transfer, incentive and reward system;
- Competitive/merit based career development and training/upgrading,;
- Put in place appropriate career structure; and
- Implementation of transparent and performance based staff promotion.

Intervention 3.8.3: Put in place a clear line of command

The agriculture sector must be led by agricultural professionals who have adequate knowledge and skill, experience, vision, ability to coordinate and organize, understand policy environment and real situation, make appropriate decision and can transform the agricultural sector by mobilizing staff in the entire agricultural system. In addition, there should be a well-defined structure and clear chain of command that ensure accountability and clear line of reporting and feedback system at various levels. It also necessary to ensure that Das are only engaged on extension related activities.

3.9 Pillar 9: Establish strong and dynamic result-based monitoring, evaluation and learning (RBME&L) for continuous improvement of extension services delivery

Objective: To improve the capability, relevance, effectiveness, efficiency and impact of the extension service through continuous assessment, reporting, learning, documentation and feedback system

Monitoring, learning and evaluation (MLE) is a key tool to identify constraints, assess the progress, and generate relevant and timely information to make informed decisions. Decisions are changed into actions when they are based on facts and realities on the ground. Currently, efforts are being underway to put in place M&LCase Team within Training and Advisory Services Directorateto strengthen the MLE system. However, such consideration to strengthen MLE at region and Woreda levels is missing. The following bottlenecks prevent theMLE unit/case teamfromfunctioning effectively.

Bottleneck 3.9.1: Weak monitoring, learning and evaluation system

Currently there are some efforts in extension system to carry out M&E activities through field visit, meetings reporting exchanges. However, there is no consistent, organized,planned,and coordinated MLE within the agricultural extensionsystem. Theextension system is criticized for focusing on what has been achieved rather than giving equal attention to the problems and their root causes. Similarly, focuses also given to collect bulk of information that cannot be analyzed and be used for feedback, learning and decision-making.Limited capacity (infrastructure facility, skills) for data collection, analysis, and documentation has exacerbated the problems.

Bottleneck 3.9.2: Weak accountability and responsibility

The agricultural extension system lacks effective MEL system with clear roles and accountability at various levels. As a result the information collected related to effectiveness, efficiency and capability of the extension service is observed to be poor quality and sometimes exaggerated, which affects the decision making process in the extension system. Moreover, the emphasis given for the implementation of timely reporting and undertaking of a systematic MEL system is very low.

Key proposed strategic interventions

Intervention 3.9.1a: Develop, institutionalize, and implement result based monitoring, evaluation and learning (RBME&L) system for extension services

To radically improve the MLE system, the following interventions are suggested:

- Review the current MLE system's strengths, limitations and challenges;
- Develop effective and efficient MLE system with participation of key stakeholders at all levels. This should indicate the outputs, outcomes and impacts of extension services;
- Prepare MLE guidelines with clear roles, duties and accountability mechanisms and build the capacity of extension workers on MLE and its implementation; and
- Institutionalize RB-MLE at different levels for extension services.

Intervention 3.9.1b: Install ICT-based data collection and tracking system

Currently the use of ICT for data collection, analysis, tracking and feedback and improving data lag is widely recognized. ICT-based MLE for the extension services enhances for quick, up to date, efficient & effective information exchange. This however, requires modern ICT equipment, facilities, and skilled work force to improve the information communication and feedback system from Federal-Kebele levels.

Box 6: Success story on effective implementation of MLE

The Agricultural Extension Performance Management System (AEPMS) being developed by Oxfam America and MoANR is intended to improve the performance of the system. It is a means for decision-makers to listen to and work with farmers and front-line extension workers by putting their voices upfront. AEPMS ensures that the system is more responsive and accountable to farmers by producing high quality 'real-time' data on 'why and how' the current system operates and its performance measured and sustained if found good. Uniquely, it proposes a systemic, democratic, and context-sensitive approach for a continuous knowledge creation, management and action rather than simply generating data and analyzing feedback. Moreover, it relies on principles of cost-effectiveness, timeliness, and ease of use; and it also produces data for comparative performance analysis between different administration levels. AEPMS has enabled a feedback system that provides perceptive inputs on the current system in six pilot woredas.

AEPMS represents a radical departure from existing M&E and performance management practices in agricultural extension. Traditional approaches to doing M&E in agriculture extension have focused on activities, outputs and to limited extent higher level outcomes. Moreover, data focuses on 'what has happened,' not 'why and how is it happening' mostly without a methodical approach that orients learning. This, however, provides limited insights into why things are working or not working and does not help decision-makers find solutions to the problems they face. Farmers and front-line extension workers, (groups who directly experience the practical challenges of turning targets and objectives into reality) can provide vital evidence that can help highlight key problems and their solutions.

The AEPMS is not just a once-off method for collecting and analyzing survey data, but open and closed perceptual feedback data are collected periodically from farmers and front-line extension workers on key aspects of performance of the extension system using:

- **Farmers' voice diagnostic feedback tool:** To capture framers feedback on overall kebele level extension system (range of tech, quality of services, priority issues, roles played by keble level actors, challenges, etc.).
- **DAs and SMS satisfaction tool:** To collect feedback on things that enables them to perform well and increase their satisfaction, enabling work environment, capacity self-assessment, and major obstacles.
- **Technology tracker tool**: How individual farmers are experiencing one or more technologies (stage of adoption, benefit they get from the technology introduced, challenges to adoption, rating tech against seven performance dimensions).
- **Micro survey tool:** To provide independent feedback from the recipient of the training, services, quality of

Intervention 3.9.2: Establish responsibility and accountability mechanism

In order to implement effective MEL system in the extension service, there should be clear responsibility and accountability at all levels. This responsibility among others includes need and problems identification, timely planning, organizing and implementation, analysis and feedback of MEL system with focus on the process and results of the extension system. The responsibility also includes effective utilization of the results of the M&E system to improve the effectiveness, efficiency, and impacts of the extension service through undertaking corrective measures and scaling up of good practices. Communicating feedbacks to farmers and other stakeholders is also another part responsibility that needs attention through the MEL process. In addition, individuals, offices at various levels should be accountable for timely undertaking and quality reporting system.

Section 4: Implementation Framework

The implementation of this strategy requires the involvement of key organizations including public, NGOs and private sector at various levels. Ministry of Agriculture and Natural Resources (MoANR) will take the lead for the coordination of these organizations for its effective implementation. Thus, the success in the provision of market and client- oriented and multi-actor's advisory extension services depend on the active participation and commitment of these actors. Moreover, addressing the bottlenecks and ensuring the implementation of strategic interventions require synergistic and integrated approaches among organizations engaged in agricultural development. Thus, this framework outlines the major roles and responsibilities of different organizations at various levels from Federal to Kebele. It also identifies the priority processes and interventions.

4.1. Roles and responsibilities at various levels

4.1.1. At Federal level

Ministry of Agricultural and Natural Resource is responsible to develop and approve the national agricultural extension strategy and supports its further implementation through the provision of technical backstopping and monitoring & evaluation. Some of the roles and responsibilities ofMoANR are mentioned as follow.

- Conduct national workshop to familiarize the extension strategy;
- Facilitate cross learning among regions;
- Collect and document, as well as, design&implement the scaling up of good practices from the regions and abroad to improve further implementation;
- Carrying out shopping of technologies;
- National level coordination;
- Create enabling environment for the provision of required inputs;
- Strengthen and leading linkage with relevant public and private organizations to access knowledge and services at Federal level;
- Develop projects to mobilize resources to support the extension service;
- Coordinate to promote and establish ICT-based extension services and market information system.; and
- Conduct impact assessment

4.1.2. At Regional level

Regional Bureau of Agriculture and Natural Resource (R-BoANR) is responsible to oversee the integration and harmonization of activities outlined in the strategy document during its implementation. It is expected to facilitate the coordination and alignment of the intervention among development collaborates at regional levels so that coordinated agricultural extension services are delivered at Zonal and Woreda levels. Moreover, R-BoANRis also responsible for the

preparation and approval of annual plans and required budget related to the implementation of interventions outlined in the document. It also reviews the quarter, biannual and annual progress reports related to the implementation of agreed intervention at regional level.

- Conduct regional level workshop to familiarize the extension strategy to Regional and Woreda key stakeholders;
- Facilitate cross learning among Woredas;
- Collect and document good practices from the other regions and within Woredasto improve further implementation;
- Regional level coordination;
- Create enabling environment for the provision of required inputs for farmers within the region;
- Strengthen linkage with relevant NGOs within the region for effective implementation of the strategy; and
- Conduct supervision to provide technical assistance,

4.1.3. At Woreda level

- Conduct Woreda level workshop to familiarize the extension strategy to woreda key stakeholders;
- Facilitate experience sharing and learning process among kebels and woredas;
- Collect and document good practices Kebeles and deliver the data to regional BoANR;
- Carries out Woreda level coordination and ensure harmonization between different initiatives;
- Assess necessary input demand and provide request on time;
- Works strongly to strengthen Woreda level NGOs and private sectors linkage for effective implementation of the strategy;
- Provide support and assistance to Das;
- Prepare Woreda annual work plan with activity involvement of woreda level stakeholders; and
- Delivers training to DAs on implementation of market-oriented and other topics.

4.1.4. At Kebelelevel

- Create awareness on the strategy for Kebele leaders, elders, religion leaders, women and youths within the kebele;
- Mobilize community and FTC-Management Committee members for successful implementation of the planned interventions;
- Conduct continuous follow up and provide supports for DAs;
- Request for the assignment of DAs;
- Ensures equal participation of male, female and youth in the implementation of the extension services;
- Collects data, maintains records and documents outcome of the activity in a clear way;
- Prepares and submit monthly reports; and
- Supports DAs for effective implementation the outlined interventions

4.2. Prioritization and Sequencing of Interventions

The implementation of the strategic interventions outlined in the document requires a long-term period of at least 15 years with 3 phases. The 1st phase covers the implementation period from 2016 to 2020, which overlaps with GTP-II implementation period. The majority of the interventions are aligned with GTP-II extension plan and they are expected to be started during this period. However, effective implementation of the intervention requires official approval of the strategy document, which may take time considering all these factors. The commencement of the 1st phase of implementation will be as of 2017. Depending on the availability of resources and human capacity the implementation of the interventions will continue until the end of 3rd phase, which will go until 2030. At the end of each phase, in depth evaluation will be conducted to identify strengthen, gaps and provide necessary remedial actions.

The implementation of all pillars and their strategic interventions mentioned under section 3 will not start at the same time because of limitations in capacity, resource availability, national, and regional priorities. Therefore, it is important to prioritize and sequencing the strategic interventions to achieve the overall goal of the extension system (Table 1; Fig. 6). In general, pillars and interventions that can serve as input for the achievement of other pillars that should be determined based on regional priorities and specific conditions.

Moreover, the implementation of all the interventions outlined within the strategy document is not only going to be managed by MoANR. It needs the commitment and contribution of other concerned key stakeholders at various levels. Therefore, it is critically important to give due consideration to the coordination among various

stakeholders. In this case, MoANR is expected to prepare guideline and detail implementation plan that clearly shows the roles and responsibilities of potential actors along the major pillars.

Thus, awareness creation for all stakeholders at various levels is crucial to enhance participation and create sense of ownership for effective implementation of the interventions. Strategic interventions indicated in this document under section 3 will implemented within the period as shown in Table 4. Existing government structures from Federal to Kebele are accountable and responsible for its overall implementation.

Table 3: Proposed key priority activities and their tentative schedule /2017-2020

No	Proposed activities	Implementation period				
		2017	2018	2019	2020	Responsibility
1	Approval of the document	XX				MoANR
2	Familiarize the strategy to key stakeholders at various levels (from Federal to Woreda)	XX				MoANR and RBoANR
3	Prepare, revised and updated sector specific extension guidelines and manuals (Eg. Irrigation, livestock, NR, mechanization)	XX				MoANR
4	Develop and provide required guidelines related to the provision client oriented and multi diverse extension service					MoANR
	• Revise /update FTC guideline/manual	XX				MoANR
	• Conduct an assessment on FTCs based on the prepared strategy (basic, intermediate and advance) levels criterial, full fill the materials accordingly	XX	XX	XX	XX	MoANR and RBoANR
	• Conduct study to identify basic facilities for ICT-based extension services	XX				MoANR and RBoANR
	• Prepare training manuals on marketing & business skills, value chain development, communication and facilitation, group formation and development, etc...	XX				MoANR
	• Prepare performance based M & E guideline	XX				MoANR
	• Prepare a guideline on the implementation pluralistic extension methods and approaches to align with public extension service					MoANR
5	Staff capacity building on prepared guideline and training materials (from Federal to Kebele)		XX	XX	XX	MoANR and RBoANR
6	Revisit and update agriculture related HHLs and ATVETs curriculum to align with the demand of agricultural development			XX		MoANR
7	Prepare detail annual work plan of the agreed at various levels					
	a) Woreda annual work plan preparation					WoANRDO
	b) Regional compressive annual work plan					RBoANR
	c) Federal level annual work plan					MoANR
8	Follow and technical support the implementation					MoANR and RBoANRandWoredas

Table 4: Pillars, major objectives and strategic interventions and their prioritization

No	Pillar	Objectives	Strategic intervention	Prioritization of the interventions		1st Phase implementation /2017-2020,				2nd phase /2021-2025/	3rd phase /2026-2030/
				1^0	2^0	2017	2018	2019	2020		
1	Strengthening FTCs through active participation of community and capacity building of DAs	To make FTCs hubs for knowledge and information sharing, for promoting improved technologies and good practices and creating self-sustaining FTC management systems that owned by the community	Increase sense of FTC ownership by farmers and improve FTC functioning and sustainability	✓							
			Allocate sufficient resource to FTCs	✓							
			Furnish and equip FTCs with basic infrastructure and facilities	✓							
			Improve support to FTCs by the local government	✓							
			Improved facilities, career-path and better incentives for DAs	✓							
			Build DAs knowledge and skill	✓							
			Promote need based and practical training to farmers	✓							
			Strengthen model farmers	✓							
2	Enhance agricultural knowledge and information system	To use effective and diversified communication channels (including ICT-led extension service delivery) to enhance access to knowledge and information exchange and utilization among beneficiaries.	Promotion of Digitalized & ICT-based extension communication system		✓						
			Strengthen farmers group based extension services	✓							
			Strengthen agricultural knowledge management within the extension system at various levels		✓						
			Enhance urban and peri –urban agriculture		✓						
			Enhance participatory technology development, verification and dissemination	✓							
			Prepare and provide diverse client-tailored extension packages & advisory services	✓							
			Enhance the development of information systems for agricultural risk management	✓							

3	Enhance client oriented and multi actor's advisory extension services	To make the extension services diverse, client-oriented and reach different categories of farmers through improving the involvement of different actors engaged in agricultural development	Strengthen pluralistic agricultural extension advisory services	✓		
			Strengthen the alignment between public & NGO's extension	✓		
			Enhance cooperative-based extension advisory services		✓	
			Improving the role of agro-processing companies in extension services		✓	
4	Enhance value chains development and innovation platforms	To transform subsistence smallholder farming to commercialized farming system through the implementation of value chain approach that promote market-oriented extension services in various agro-ecologies.	Build the capacity of the technical staff at various levels to provide market-oriented extension services	✓		
			Promote Value Chain-Based Extension Services	✓		
			Enhance Capacity Development of the actors		✓	
			Promote value chain-based linkage development	✓		
			Improve Access to Market Information and Collective Marketing	✓		
5	Gender and youth mainstreaming and empowerment	To mainstream gender issues in the broader agricultural extension programs and ensure women and youth have equal access to agricultural extension services.	Enhance the level of awareness on gender at all levels	✓		
			Strengthen gender mainstreaming actions	✓		
			Enhance the participation of women and youth in agricultural extension	✓		
			Establish and strengthen linkages and network within and other sectors		✓	
			Allocate adequate resources to gender related activities	✓		
			Enhance women's socio-economic empowerment	✓		
6	Enhance environmentally sustainable agricultural practices	To integrate environment and natural resources management issues into agricultural extension services.	Enhance NRM extension services link with livelihood strategies	✓		
			Improve technical capacity of extension staff on environment & NRM	✓		
			Promotion of climate smart agriculture and agro-metrology information	✓		
			Enhance sustainable oriented extension service		✓	

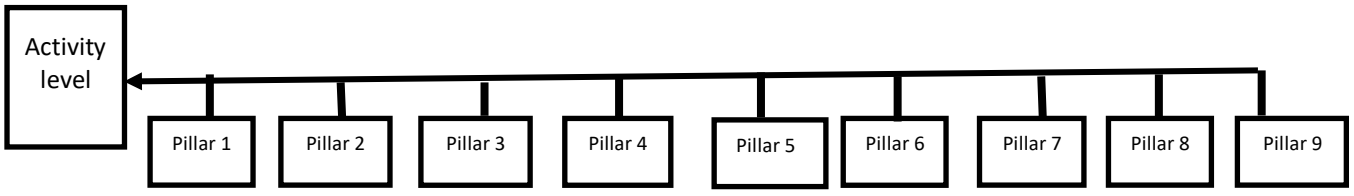
7	Enhance institutional arrangements, coordination and linkages among key agricultural development partners	To strengthen establish effective linkage forums at all levels to effect strong alliance for better extension and advisory services	Review and develop linkage forum guideline	✓		
			Creation of sustainability in the institutional arrangements for improved linkage forums		✓	
			Strengthen stakeholders' collaboration and networking		✓	
			Strengthen MLE	✓		
8	Human resource development and utilization for effective extension service delivery	To improve the efficiency and effectiveness of professionals in agricultural extension at different levels for diverse agro-ecologies, demand-driven and market-oriented extension services.	Promote and implement need based professional training at HLIs & ATVETs	✓		
			Enhance staff motivation and retention	✓		
			Assign agricultural professionals to lead agriculture development at all levels	✓		
9	Establish strong and dynamic monitoring, learning and evaluation (MLE) for continuous improvement of extension services delivery	To improve the capability, relevance, effectiveness, efficiency and impact of the extension service through continuous assessment, reporting, learning, documentation, and feedback system.	Develop and implement result based MLE system for extension services	✓		
			Install ICT-based data collection and tracking system		✓	

Section 5: Result Based Monitoring, Learning and Evaluation (RB-MEL)

A monitoring, learning and evaluation (MLE) framework for this strategy depends on results framework to ensure whether or not the activities on the ground are on track to meeting the planned objectives. The results framework consists of outputs, outcomes and impact, each of which has a set of indicators. The outputs can be achieved directly by implementing the interventions outlined in the document, whose achievement can be measured through various indicators. The successful realization of these outputs will enhance the effectiveness and efficiency of the extension system, which is the anticipated outcome.

Table 5: Performance indicators at (Impact, Outcome and Outputs levels)

Impact	Impact indicators at different phases
incomes by smallholder farmers	% smallholder farmers (male, female and female) responding positively to the increment of their incomes and improvement of their livelihoods
Outcome	Outcome indicators at different phases
Increased productivity and productivity	%of production and productivity increment by smallholder farmers
Output	Output indicators at different phases
Effective and efficient market-oriented, client-tailored extension services will be provided to a more smallholder farmers in a wider geographic areas	• % smallholders farmers (male, female and youth) express their satisfaction in receiving market-oriented, demand driven and tailored-extension services • % increase in farmers that use improved technologies and practices across agro-ecologies • # of smallholder farmers, agro-pastoralists and pastoralists who implemented climate smart agriculture (CSA) to improve their resilience under natural calamities and disasters. • % of FTCs upgraded to different functionality levels (pre-basic to basic, basic to intermediate, and intermediate Advance) • % of technical staff trained at various levels and training conducted • # of extension beneficiaries (male, female and youth) • # of smallholder farmers practiced full package (crops, livestock and natural resources) • % of smallholder farmers linked with improved markets. • # of smallholder farmers received diversified extension services from different sources, • % farmers used ICT/digitalized extension communication • # linkage platforms established at various levels



Each implementation area should have a detailed work plan with detailed activities and timeframes. The institutional owners should ensure that the activities are aligned with the above results framework. The results framework should be accompanied by a performance measurement plan, which will enable the concerned institutions to collect the appropriate data and report. These data will be reviewed and evaluated at regular meetings. While ensuring focus on the vision and effectiveness of interventions, should be flexible to respond to the emerging needs and challenges.

In conclusion, the strategy takes a long-term perspective and appreciates the dynamic nature of the extension system in Ethiopia. As the country is heading to transition to middle-income level by 2025, the agriculture

sector will have to accommodate a market-led transformation. By providing an overall framework to strengthen the extension system, this strategy will enable the extension system to play a critical role in agricultural transformation. It is expected that this strategy will be reviewed and revised on regular basis to incorporate new thinking and new implementation tactics based on lessons learned and emerging realities.

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