



Innovation platforms for improving productivity in mixed farming systems in Ethiopia: Institutions and modalities



Produced by

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Published by

World Agroforestry Centre (ICRAF) and the Ethiopian Institute of Agricultural Research (EIAR)

March 7, 2014



The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three regional projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads the program's monitoring, evaluation and impact assessment. <http://africa-rising.net/>



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This document was made possible with support from the American people delivered through the United States Agency for International Development (USAID) as part of the US Government's Feed the Future Initiative. The contents are the responsibility of the producing organization and do not necessarily reflect the opinion of USAID or the U.S. Government.

Correct citation: Kaleb Kelemu, Aster Gebrekirstos and Kiros Hadgu (2014). Innovation platforms for improving productivity in mixed farming systems in Ethiopia: Institutions and Modalities. Nairobi: ICRAF.

Abstract

The purpose of this study was to generate information that provide comprehensive understanding of the constraints of tree-crop-livestock farming system in four sites of the Africa RISING project (Basona werana woreda in Amhara region, Endamehoni woreda in Tigray Region, Sinana woreda in Oromia region and Lemo woreda in Southern Nations Nationalities People (SNNP) region, Ethiopia). The study identified relevant institutions in the study locations to develop modalities for establishment of Innovation Platform (IP). The identified institutions were gathered together to identify and prioritize problems and consult on the improvement of mixed farming system in their area. Quantitative and qualitative data were collected from key informants (e.g., agricultural experts, development agents, kebele administrators and group of farmers) using structured interviews. The study identified the main sources of livelihood for smallholders in the studied sites such as, crop production, livestock, trees and casual labor.

There is limited effort so far done by available institutions to promote integrated agricultural practices. This calls for design and implementation of various intervention programs that aim at improving existing technologies and agricultural practices that address farmers interest and create awareness and knowledge based trainings for farmers and extension workers. The study devised modalities for establishing effective innovation platform in the study sites. There are huge potential opportunities to the use of innovation platforms as many actors involved in agricultural development activities in the studied kebeles have keen interest for collaborative actions. The IP is very crucial to strengthen the existing partnerships and build new partnerships amongst various stakeholders (research institutions, Agricultural development and extension sectors, policy makers, farmers, higher education, private sectors etc...). It helps to share information, plan, implement and monitor development and research activities jointly to address current and future problems of the farming systems in the studied sites. The innovation platform can be established mainly at Woreda level with good innovation networks at Kebel level. There is the need to look at Innovation platforms dynamically and pay more attention to mechanisms that strengthen feedback, learning and adaptive management in innovation processes.

Keywords: *Institutions, Livelihood sources, Land coverage, Innovation platforms*

Acknowledgements

It is a pleasure to present our sincere thanks to Dawit Abate, Mohammed Ibrahim, and Tamrat Lijamo for their unreserved commitment and dedication during data collection process in all studied sites. We would also like to thank kebele administrators and members of the kebele cabinets who were involved during the survey and for their cooperation to provide the necessary information during the whole study period. Many thanks also to development agents of all studied kebeles, experts of woreda agriculture offices and farmers for their willingness to provide all the necessary information for this study. We also thank Mr. Negash Mamo and Walelegn Ayano from Forestry Research Center of the Ethiopian Institute of Agricultural Research for their assistant during data collection. Our thanks to Dr. Aklilu Negussie for his comments on the draft report. Our sincere thanks to ILRI/USAID for their financial and logistic support and all members of the Africa RISING researchers for their collaboration.

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Acronyms

AISCO	Agricultural Input Supply Company
AGP	Agricultural Growth Program
ATA	Agricultural Transformation Agency
BVC	Barley Value Chain
DA	Development Agent
ESE	Ethiopian Seed Enterprise
FTC	Farmers Training Centre
GRAD	Graduation with Resilience to Achieve Sustainable Development
HABP	Household Asset Building Project
IP	Innovation Platform
KI	Key Informant
KII	Key Informant Interview
RBoA	Regional Bureau of Agriculture
SLM	Sustainable Land Management
WVC	Wheat Value Chain

Introduction

To reduce food insecurity in Africa, agricultural sectors intensification is essential. Analyzing on-going experiences that support innovation in agriculture provides an important contribution towards improving agricultural development and food security in Africa. Moving beyond the usual linkages of farmers, extension and research institutes long involved in agricultural development programs, innovation platforms reach out to a wider group of stakeholders. The model for generating change embraced by Innovation Platforms (IP) is also intrinsically different from the Transfer of Technology model which has been the predominant approach used by practitioners of agricultural research and development (ARD) around the world (Nederlof et al., 2011).

Strengthening the linkages and interaction between agriculture and rural development actors has been considered as key to improve efficiency and effectiveness of ARD efforts aimed at raising the level of economic performance of rural economy through increased productivity. By bringing actors in IP, it is possible to generate innovation by combining their indigenous knowledge and practices, interests and skills (Hall, 2006). Learning how to build up linkages and encouraging interaction between farmers, researchers, advisory services, development organizations and the private sector is still a key challenge for operationalizing the innovation systems concept (Sanginga et al., 2009). Innovative Platforms are tools that help stakeholders to interact in a concerted manner (Nederlof et al., 2011).

The concept of IP refers to a set of stakeholders bound together by their individual interests in a shared issue, challenge or opportunity, intending to improve livelihoods, enterprises and/or other interests. It is made up of various actors who co-operate, communicate and share tasks to carry out activities needed for innovation to take place (FARA, 2007). It provides a physical or virtual forum for exploring opportunities to address those common issues, and investigating and implementing joint solutions. Stakeholders have a shared objective in coming together, which needs to be clear to all participants, and translate it into a commitment to co-operate (Nederlof et al., 2011). A common assumption behind the platforms is that, actors need an initial push or opportunity to break barriers against joint discussion, action, sharing and learning. Platforms can provide the space for such joint work and interaction (Devaux et al., 2007).

IPs can be formed at different levels (local and national) and in different sectors (dairy, horticulture, etc...), and may have different objectives. They are often set up as a result of common problems found in a specific sector or sub-sector for which solutions depend on more than one actor. Actors may have different interests and may yet share a common objective and depend one on another. IPs are therefore tailor-made to respond to the challenges and opportunities encountered (Nederlof et al., 2011). As innovation platforms are instrumental to enhance the technology generation and dissemination systems and to improve the performance of the farming practices and knowledge, establishing such platforms is very crucial step. In order to establish and put in place effective and well functioning platforms understanding the existing systems, key livelihood challenges, (available and potentials) institutions and challenges of establishing platforms in target areas should be considered. This study was conducted with the purpose of generating information that may help to gain comprehensive understanding of the livelihood pattern, key challenges of mixed farming systems and value chains of major farm products, key institutions and actors operating in the target areas. Finally we devised modalities for establishing effective innovation platform in the study sites.

Objectives

The specific objectives of the study were:

- Identify and describe major livelihood sources and explain their importance;
- Identify major crop, livestock and tree commodity products and describe their constraints;
- Explain functioning of value chains of major agricultural commodities;
- Identify different types of relevant institutions and describe their characteristics and functions;
- Devise modalities for establishing IPs

Methodology

Description of Study Areas

The Africa RISING project is testing interventions to enable sustainable intensification of agriculture in three major regions of Africa, one being the highland areas of Ethiopia. The highlands have large variations in existing levels of intensification with cereal-legume rotations and other crop-combinations, as well as crop-livestock integration. Furthermore, factors driving agricultural intensification, such as, agricultural potential, access to available technologies, and access to markets varies considerably across regions (Ellis-Jones Jim et al., 2013). Accordingly the project sites included in this study were, Goshe Bado and Gudo Beret kebeles from Basona werana woreda (Amhara region); Emba Hasti and Tsibet kebeles from Endamehoni woreda (Tigray region); Illu-Sambitu and Selka kebeles from Sinana woreda (Oromia region) and Upper Gana and Jawe kebeles from Lemo woreda (SNNP). The project sites were major wheat producing areas (Figure 1).

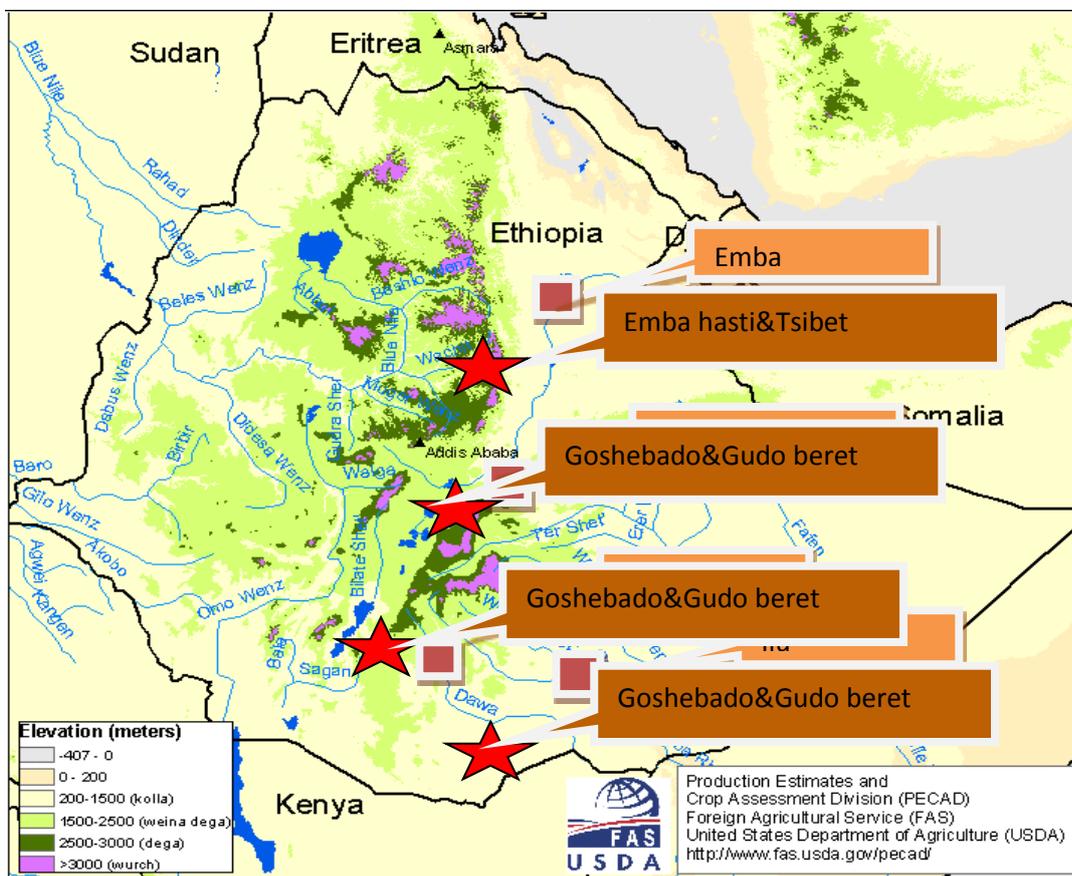


Figure 1: Map of the Study Areas

Data Collection

Both primary and secondary data were collected. The process of primary data collection involved identifying key informants from the studied sites. The key informants were selected in consultation with development agents and agriculture experts of the woredas.



Figure 2: Focus group discussion at Endamehoni woreda (Embahasti kebele)

Agricultural experts, development agents, kebele administrators and group of farmers were interviewed using checklist guided interview about the livelihood, trends, and how key institutions are operating in the studied kebeles.

The following questions were raised during the discussion with key informants:

- Major livelihood sources and trend of their importance;
- Major food and cash crops, livestock and trees grown by farmers ;
- Major institutions engaged in agriculture/natural resources management in the studied sites;
- Functioning of value chains for major commodities; and
- Challenges and opportunities to establish IPs.

Major Livelihood Sources and Trends

The major sources of livelihood for small farm holders in the studied sites were diverse which includes crop production and livestock rearing. An interview made with key informants of woreda, kebele and experts and development agents revealed that the livelihood options were expanding, as the size of the population increases and landholding size diminishes over time. The major livelihood activities and enterprises farmers were using as major sources of livelihood for each studied kebeles are described in the following sections.

Basona Werana woreda – Amhara Regional State

Cereals (e.g., wheat, barley, faba bean, field pea, chickpea), and vegetables such as, onion, lettuce, and carrot were the major sources of livelihoods in Goshe Bado kebele of Basona werana woreda. Poultry, dairy farming, sheep and goat rearing and beef fattening were also identified as the major sources of livelihoods from livestock sector. Similarly in Gudo Beret kebele of the woreda, barley, wheat, faba bean, field pea and lentil were the major crops providing livelihoods to the farmers, while, sheep, goat and beef fattening, poultry and cattle rearing were the major livestock commodities described as major sources of livelihoods to the farming community next to crop production. Trees also play a major role in the studied sites. Eucalyptus plantation/woodlots were the dominant trees which are grown on farmers filed mainly for income generation from selling of the poles. It has become number one important cash source for the entire communities in the woreda. Highland fruit, particularly Apple production was expanding at high rate in both kebeles due to agro-ecological suitability and high market value. Root crops such as potato are also commonly cultivated by large number of farmers in both kebeles.

Off-farm employment and traditional cloths making (weaving) were also other source of livelihood for few farms. As shortage of land is becoming a prominent problem, weaving is becoming a means of livelihood for few small land holders and land less households.

Endamehoni woreda – Tigray Regional State

Both studied kebeles had similar feature in terms of crop and livestock enterprises. Crop production was the major source of livelihoods in the two studied sites. The major crops types include primarily wheat and barley and, as minor crops, faba bean, field pea, chickpea and lentil. Livestock enterprises include apiary, poultry, dairy, sheep and goat rearing, and beef fattening. Sheep and goat rearing, and apiary take the lion share in the livestock sector. Though the livestock enterprises are important sources of livelihoods for the farming community, level of support farmers has given from agricultural offices is very limited. This led to low production (quality and quantity) from livestock. Moreover in Emba Hasti and Tsibet woredas many farmers kept large number but less productive cattle.

Non-timber forest products have been got high attention as a source of livelihood. These resources were providing mainly cash income to the farm households. The pressure on the use of non-timber forest products increased from time to time due to the need for supplementary sources of livelihood in addition to crop and livestock.

Lemo Woreda – SNNP Regional State

Generally, crop, livestock, and off farm employment were the major source of livelihood in priority sequence order. In Lemo woreda, wheat, tef, potato, faba bean, maize, enset, and barley were the most widely grown crop commodities as a source of livelihood in upper Gana and Jewa kebeles of the woreda. Wheat was grown by almost every household in the woreda. It was produced both for home consumption and market. Wheat straw found the main source of animal feed in the sites, which made it the most important commodity for farm households in the entire woreda. Ox, dairy

cow, sheep, goat, poultry and donkey were important livestock which farmers keep as a source of livelihood next to crop.

Off-farm activities were also mentioned as the most important sources of livelihood next to crop and livestock enterprises. Similarly cereal trading and eucalyptus plantations were also identified as important cash source for the farmers.

Wheat was the most important crop ranked as number one source of livelihood. However, yellow rust was mentioned as the major disease that would threaten wheat productivity. Yellow rust was the most frequently occurring disease, especially at times of excess rain. Very few farmers use chemical pesticides to control yellow rust. Unidentified root rot worms and leaf chewer flying insect pests were also other threats to wheat production in the studied sites. Trees are part of the farming system as source of fodder, fruit and soil conservation and income. There is high demand for fruit and fodder trees.

Sinana Wereda-Oromia Regional State

Both sites (Illu-Sambitu and Selka in the Sinana wereda) have similar living sources that come mainly from crops and livestock. Crop production, poultry, petty trading and equines renting for transport were the major sources of livelihood. Dairy farming and oxen for draft power and fattening were the second most important sources of livelihood. Among the crop types wheat, barley and emmer wheat were the most important ones. The two kebeles were the major wheat producing areas both in Oromia region as well as in Ethiopia. Both small and large scale farmers produced wheat both for home consumption and market. Tree plantation is less common in the area but there is strong interest.

Table 2: Trends in importance of livelihood and cash sources in Basona werana, Endamehoni, lemo and sinana woredas

Livelihood sources	Importance level High=1 Medium =2 Low=3		Trend in importance as livelihood and cash source			
	Livelihood source	Cash source	Increasing	Decreasing	No change	Reasons
Wheat	1	2	√			Agro ecological suitability and
faba bean	1	1	√			Rising market demand and agr
Barley	1	1	√			Agro ecological suitability and
Tef	2	1	√			Increased market price
Maize	1	2	√			To meet household food cons
Lentil	2	1	√			Increased market demand
Sorghum	2	2			√	Limited agro-ecological suitab
Chickpea	2	2	√			Increased market demand
field pea	1	1	√			Increased demand and price
casual labor	2	2	√			Increased opportunity
Cereal trading			√			Need for supplementary incor
Vegetables	1	1	√			Increased demand and access
Eucalyptus	1	1	√			High market demand and price
bee keeping	3	1	√			High market demand; beehive
Dairy	3	2	√			Increasing demand from near
beef fattening	3	1	√			Increased demand and price
Poultry	3	2		√		Prevalence of diseases
sheep and goat	2	2	√			Increased demand and price
Charcoal making	3	2		√		Depletion of tree resources

Major agricultural commodities/ trees grown and livestock resources

Crops Grown and Major Constraints

Major crop commodities being grown by farmers in the Basona Werana are quite large in number. But the most important ones are, wheat, barley, faba bean, field pea, lentil, vegetables (mainly onion), and root crops. The importance of these crop enterprises was mainly because of increasing trend in input use and productivity improvement. In addition, the rising of their price in local markets were attracted many farmers to grow these commodities. The adaptive capacity of these enterprises for the local agro-ecological condition was also mentioned as a key factor to keep these crop enterprises as important agricultural commodities. Cereals were mainly produced for home consumption but when cash is needed 20-30% of the total produces might be sold in local markets. Vegetables and root crops are mainly produced for market.

Occurrence of diseases such as chocolate spot on barley and rust on wheat, hail and frost, landslide, weed prevalence, erratic rainfall were the major constraints that affect crop production and productivity in the woreda. Some years ago Goshe Bado kebele was one of the belg season (off-season) producing area in the woreda, but these days due to change in climate, belg season production has stopped. Farmers say 'belg season production has become a history.'



At 47 years old, farmer Adinew is a father of 4 and lives in Goshe Bado kebele. He explains that disruption in the rain pattern during the last 10-15 years is the most threatening phenomena that have significantly affected the farming system. He said fodder availability has declined, his dairy cow milk yielded has decreased, belg season harvest he used to get has ceased mainly because of the belg season rain has already gone.

The survey conducted at Ebma Hasti and Tsibet kebeles of Endamehoni woreda shows that wheat, barley, faba bean, field pea and lentil were the major crop enterprises that have been grown by most farmers. In both kebeles barley was the major crop commodity with big land coverage, followed by wheat and faba bean respectively.

Disease and pest prevalence, which could not be controlled by those chemicals being supplied in the market were the major constraints for low productivity of crops in the area. In addition, high incidence of hail, erosive rain and over flows are leading to the formation of huge gullies in the area which would in turn reduce land productivity. Limited access to improved seed varieties particularly for the major crops such as wheat, barley and faba bean were also mentioned as a constraint in the crop production system of the area.

The major crop commodities produced by farmers in Upper Gana and Jewa kebeles of Lemo woreda were wheat, tef, enset, maize, potato, faba bean and barley. The major constraints that reduce productivity of these crops were, limited access to seeds of improved varieties, poor farming

practices (such as, poor ploughing system, weed and diseases infestations) and untimely harvesting and storage problems.

The major crop commodities being grown by farmers in Illu-Sambitu and Selka sites were wheat and barley. Wheat production was the dominant enterprise, almost all farmers of the kebele were engaged in. Wheat was the dominant crop produced both in Belg and Meher season. Meda Welabu, Ejersa, Tusse, Paven, Digelu, Sofumer and Metejebo were the major local wheat varieties in the area. The data obtained from the woreda agricultural office showed that, about 20 wheat varieties are under production in the woreda. The key informants and model farmers mentioned that seed multiplication and banking at farmer's level are not common practice. As a result farmers of the woreda buy seed every year. The price of 100 kg of improved wheat varieties might range from 1000-1200 Ethiopian birr.

As the key informants, prevalence and emergence of diseases and pests, weed, high cost of inputs mainly fertilizer and seed, backward farming system and knowledge, limited financial capital and fluctuating market prices were identified as the major constraints of wheat production in the sites. Wheat growing farmers in the woreda used to complain that, the cost of production is increasing from time to time while the selling price of produces remains always constant. Model farmer interviewed and key informants from the woreda agriculture office suggest that, market arrangement through strengthening cooperative unions would enhance bargaining power of the farmers to get better price for their products.

The key informants have identified 'Ginchi', 'Sinar', 'Gali', 'Ashekit' and 'Kumudo' were the major weed species affecting wheat productivity in the woreda. 'Ginchi' was mentioned frequently by FGD participants throughout the discussion, as the most threatening weed that significantly affecting wheat in the entire woreda. Farmers use a very expensive chemical called 'Palace' costing 2500-3000 Ethiopian birr/liter. Cooperative Unions and private vendors are supplying the chemical but very limited. Dialogue participants and key informants have mentioned the presence of alien weed species that have never been exist before in the woreda.

Livestock enterprises and major constraints

Sheep and goat fattening, dairy farming, poultry, beekeeping are the major livestock enterprises in Goshe bado and Gudo beret kebeles. These livestock enterprises are also important sources of cash income. Poultry enterprise is mainly managed by women and the income is also utilized by women. Sheep fattening is the major livestock commodities that every household keep and have significant contribution to their livelihood and additional cash income. Absence or limited supply of improved breeds, poor management, water shortage, diseases, shortage of grazing lands and quality fodder were identified as the major constraints of livestock production. Interviewed farmers mentioned that absence of improved livestock breeds and chicken are the key constraints that kept livestock and poultry productivity very low in the area. The woreda Agricultural office report shows that, the average milk production for a local breed ranges 1-1.5 liter per day.

Dairy farming, sheep and goat rearing, poultry and beekeeping are the major livestock enterprises in both studied sites of Endamehoni woreda. These enterprises are the dominant sources of cash income for every household in the woreda. Disease and high cost and shortage of animal feed in local market were the constraints that are affecting livestock production and productivity in Endamehoni woreda. Shortage of supply of improved breeds of livestock, particularly dairy cows and chicken were mentioned as the most constraints undermining productivity. Above all, the key informants revealed that the level of emphasis that has been given to livestock sector by most governmental institutions is very minimal.

Cattle, sheep and goat, poultry, beekeeping were the major livestock in upper Gana and Jewa kebeles of Lemo woreda. Livestock play a significant role to the farmers to meet household needs for cash and supplement livelihood. Lack of improved breeds, limited access to veterinary services,

and diseases were identified to be the most critical constraints affecting livestock productivity in the area. The level of emphasis given to the livestock sector is very insignificant.

Poultry production, sheep and cattle fattening and dairy farming are livestock enterprises that farmers in Illu-Sambitu and Selka kebele are engaged. These enterprises are mainly serving as cash income source. Occurrence of diseases, pests, shortage of feed, rising cost of feed in the market, and lack of grazing lands were identified as key constraints of livestock enterprises in both kebeles. Above all, lack of improved breeds supply was mentioned as the critical problems that kept livestock productivity very low in both kebeles.

Trees and their major constraints

Eucalyptus plantation is found to be the major and overwhelmingly tree product commodity being used as the major source of cash income in both studied kebeles of Basona Werana woreda. Eucalyptus seedlings are supplied mainly by private and government nurseries. In addition, apple is also becoming the major fruit tree being grown by number of farmers during the last 5-7 years. As the market demand and price of apple is high both in local and nearby towns, many farmers are growing it on their back yard. Supply of adequate apple seedlings and technical knowhow is a critical problem. Despite their limited coverage, avocado, papaya, and banana are also the other fruit trees being cultivated in lowland areas of the kebeles. Tree lucer is the major fodder tree species promoted by NGO in the kebeles and woreda agriculture offices.

Eucalyptus is still the dominantly available tree species serving as source of cash income, in Endamehoni woreda. The ever increasing demand for fast growing tree for fuel and construction both in the local and regional market are mentioned as the very cause of rapid expansion of the eucalyptus farming in all areas of the kebeles. Farmers explained many traders come to their village to buy eucalyptus log. All key informants agree that the tradition and practice of agro-forestry is very low in all kebeles and the efforts done by any institution so far is very weak.

Trees grown in Lemo woreda are mainly mango, Banana, eucalyptus. Eucalyptus is becoming the most important tree species grown for market. It is mentioned as the most profitable enterprise as the cost of production is very small and fast growing nature. Shortage of nurseries to multiply and supply important fruit and fodder tree species, lack of proper management, and small land holding size were the most critical limiting factors for the development of the enterprise in the kebeles.

The expansion of eucalyptus as supplementary source of cash income is also growing both in Illu-Sambitu and Selka kebeles of Sinana woreda. There are no tree species mentioned by key informants which are grown by farmers in the two kebeles. The major constraints of tree enterprises in the woreda are shortage of seedlings, shortage of land and lack of knowledge on the management of planted seedlings.

Major farming system constraints

Crops

Many of the constraints that are undermining productivity of crop-livestock-tree farming systems are diverse and calls for collaborative actions by different actors/institutions.

Basona werana woreda

- *Limited and untimely supply of improved varieties of wheat, barley, faba bean, field pea, lentil.* Important seed varieties such as wheat are supplied in small quantity. The farmers' seed multiplication scheme has shown tremendous role to curb the problem, which need to be strengthened through engaging more farmers and deploy adequate technical support and follow-up.
- *Disease occurrence such as leaf and stem rust and chocolate spot*
- *Weed infestation:* there are many newly emerging weed species that are difficult to control. As the cost of chemical is very high and increasing from time to time and adulteration problems of chemicals supplied by private vendors, controlling weeds has become a serious challenge for farmers
- *Erratic rainfall pattern*
- *Hail and frost attack*
- *Declining soil fertility-this is mainly due to increased erosion and limited crop rotation practices*
- *Rising cost of fertilizers*
- *Poor land management*-farmer don't plough their farm land in time and don't apply the recommended frequency of ploughing, they don't weed at the right time and frequency.

Endamehoni woreda

- *Erosion:* severely degrading farm lands and gullies are formed
- *Pest and diseases occurrence*
- *Weed:* most weed species becoming serious challenge for major crops
- *Frost and hail:* in some cases totally devastate the whole village crop lands
- *Water stress:* erratic rainfall pattern
- *Poor land management*
- *Water logging*

Lemo woreda

- Limited supply of improved seed varieties,
- Poor crop management practices by farmers
- Weed, pest and disease outbreaks
- Limited supply of agricultural chemicals
- Poor harvesting techniques and lack of technologies
- Post harvest: storage problems

Sinana Wereda

- Limited supply of improved seed varieties both at the right time and quantity; (ranked 1st). Farmers complain that there is always delay in the supply of seed. The discussion held with cooperative office of the kebele shows that farmers don't request the type of seed they need before the planting time. Farmers need to plan their annual farm activity including the time they should submit their seed demand by type and quantity.

- Expansion of weed species called ‘Ginchi’ and limited supply and high cost of chemicals
- Rising price of fertilizer; as cost of fertilizer is high, smallholder farmers are forced to produce wheat without fertilizer which results low yield per hectare.
- Some farmers opt for renting out their farm to rich farmers.
- Market: farmers are getting less for their produce compared to the cost they incur to produce.

Livestock

The major constraints and problems that affect livestock production and productivity in the woredas are the following:

Basona werana

- Limited supply of improved breeds of dairy cows, poultry, sheep and goat
- Severe shortage of animal feed and high cost of feed in market
- Prevalence of diseases mainly poultry and sheep
- Use of dangerous chemical for crop production affected honeybees
- Water shortage

Enadamehoni woreda

- Feed shortage and high cost of animal feed
- Water shortage
- Diseases; particularly of poultry and cattle and sheep
- Poor management practice of farmers

Lemo woreda

- Limited supply of improved breeds;
- Limited supply and availability of fodder and high cost of animal feed
- Lack of improved animal health and artificial insemination services.

Sinana wereda

- Shortage of feed in quantity and quality
- Lack of awareness on the management of seedlings
- Shortage of land

Trees

The following are common problems affecting trees. The problems are similar for all studied woredas. The tradition and practice of planting trees on farm land is found to be very low. This is to mean agro-forestry practices are very low. This is attributable to the lack of knowledge and attitude of farmers that planting trees on farm could compete with crops. The intervention done so far by agriculture office of the woreda is very low and limited. There are several cross cutting issues and problems that are prevailing and need to be addressed to effectively promote sustainable crop-livestock-tree mixed farming systems. The major ones are described below:

- Rising costs of inputs, particularly fertilizer which led many farmers to apply fertilizer levels below the recommended rate.
- Fluctuation of market prices and unfair benefit sharing in commodities value chain. For example, farmer’s share of benefit from wheat, barley, vegetables, root crops total value is

very low. Traders are the one benefiting most. This is mainly because farmers are price takers whereas traders are the one that determine the market price of products.

- Farmer's knowledge level on sustainable agricultural practices is low.
- Documentation and dissemination of best practices in agro-forestry and use of audio-visual techniques to show farmers experiences of other countries is very low.

Understanding selected major commodity value chains

Key informant interview and focused group discussion revealed that wheat and barley are major commodities farmers are producing as a source of livelihoods. The area of coverage of these commodities compared to other commodities was used as selection criteria to do value chain analysis. These commodities are being produced by majority of farmers of the studied woredas. These commodities apart from being a major source of livelihood, they are also a good source of cash income.

Wheat Value Chain (WVC)

i. Brief Description of Wheat Value Chain

Wheat value chain (WVC) is the most sophisticated and well developed value chain compared to other cereal commodities grown by farmers. All kebeles including in the study sites are major wheat producing areas of the country. The wheat produced in the studied kebeles is supplied to consumers and flour processing factories located in different parts of the country. Wheat trader's movement into these areas is very high. WVC has several constraints that affect efficiency and smooth functioning. These constraints are mainly affect production stages of the value chain. Farmers particularly smallholder farmers are most affected by these constraints. These major constraints are prevalence of leaf and stem rust diseases which significantly reduce yield, weed infestation which are becoming difficult to control using currently supplied chemicals, fluctuating market prices and raising the cost of harvesting and threshing are the major constraints for wheat producing farmers.

The WVC is characterized by inequitable benefit sharing between farmers and traders. According to the key informant experts of the respective woredas, farmers are receiving less compared to traders. This mainly attributed to the fact that farmers are price taker while traders are price makers in a WVC.

Almost all farmers in the studied kebeles grow wheat. The major varieties farmers in Sinana woreda are using are Digelu also locally called 'Shege' (HAR-3116), Tusse (HAR-1407), Kubsa (HAR-1685), Dendea, Paven, Kekeba, Meda welabu and Galema. Digelu and Tusse are the most wanted varieties by farmers based on their high yield and resistance to major diseases.

HAR-1685 locally called 'Dashen'; Dendea (Danpge); HAR-2501; black colored variety called 'tselem sinday'; and Sinday Bani, are common varieties that most farmers are cultivating throughout the woreda. As Emba hasti and tsibet kebeles are the major wheat producing kebeles of the woreda, all of the varieties that were introduced in the woreda are also found in these two kebeles.

Variety preference criteria of farmers' were identified. Accordingly, productivity, resistance to rust and major weed species, marketability and duration to maturity were the major criteria that farmers use to select their best variety. HAR-2501 variety was ranked as one of the best variety of all based on its resistance to disease and short gestation period. In Goshe bado and Gudo Beret kebeles of Basona werana the varieties being grown by farmers are HAR-1685; Kekeba, (Picaflor); Digelu and Dendea (Danpge). HAR-1685 is the oldest variety which majority of farmers know very well. Kekeba

variety is the second oldest variety which, majority of farmers of the woreda have access to and currently cultivating it. The last two varieties are introduced very recently. As the susceptibility of the long serving HAR-1685 variety to rust posing and a serious risk of total production failure, farmers are replacing it with new varieties such as Kekeba, Danpge and Digelu varieties.

As Digelu and Danpge varieties are recently introduced in the woreda, there are only 120 farmers who have got access to these varieties, who are actually model farmers and supposed to multiply the seed and transfer to other farmers in any form of exchange they deem desirable. Farmers explained both Danpge and kekeba have comparable yield performance but the kekeba has been preferred most than Danpge because of threshability quality. Grain of kekeba easily detach from the head during threshing whereas Danpge is very difficult to easily detach the grain during threshing. Danpge (Dendea), Adaye (Digelu), Fulani(HAR 1685-Kubsa), and Legamo (HAR 604) are the main wheat varieties currently grown by farmers of the woreda. Both gender FGD participants were asked about the criteria for their variety preference. The respondents mentioned that yield, resistance to major disease (rust), resistance to weed and marketability were the criteria. Out of the four varieties, Adaye(Digelu) has been rated top by all criteria. Following the same criteria farmers rated Danpge (Gigelu) the second most preferred variety in the studied woreda. The major seed source of these varieties in the studied sites was Ethiopia seed enterprise and the varieties were supplied by the woreda office of agriculture. Cooperatives are available but are engaged only in supplying herbicides. Farmers complain that seed is very expensive. Farmers supposed to buy seeds at times (e.g. June and July) when farmers run out of stored grain and money. According to key informant farmers, seed is not only expensive but also supplied in limited quantity.

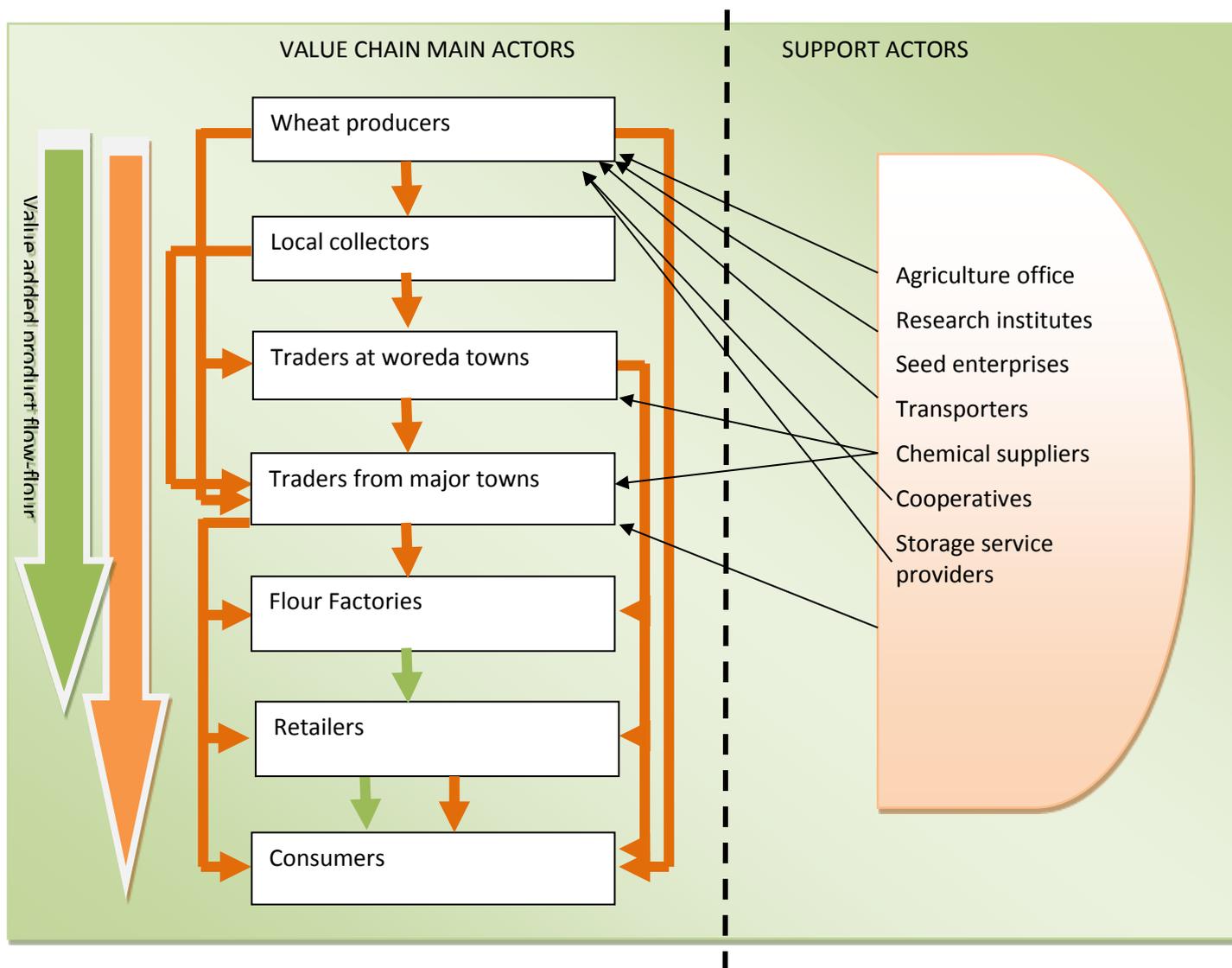


Figure 1: Simplified Map of Wheat Value Chain

ii. Wheat Value Chain Actors

WVC main actors are those institutions or individuals that are engaged in value addition activities as the product moves along the value chain. The main actors in WVC are the following:

- **Farmers (Wheat producers)**-small farmers and large scale farmers. farmers produce and supply wheat in local market. Small farmers produce wheat on small plot based land. But large scale farmers produce wheat both on their own land and on lands they rented-in from other farmers.
- **Local collectors**-these are farmers and small traders operating within the village collecting wheat produces from village markets. They supply the wheat they collected both to traders located at woreda towns.
- **Traders at woreda towns** (Bale robe, Hosana, Maichew, Alamata, Debre Berhan, Shoa Robit, etc...)- These traders usually buy wheat from local collectors and supply in large volume to traders coming from major towns of the country and factories. These traders are powerful actors in the value chain, who can decide the market price of wheat.

- **Traders from major towns-** These traders buy wheat from traders at woreda town and usually buy in large quantity and transport to many areas of the country to supply to major markets as well as flour factories. These traders come from Addis Ababa, Adama, Mekele, desse, Bahirdar, and Hawassa.
- **Consumers-** Consumers of wheat are naturally dispersed around the country. Consumers other than wheat producing farmers get wheat through traders.
- **Flour Factories-** these are major buyers of wheat grains mainly from traders and they are also major supplier of wheat flour to individual consumers and bakeries. Factories in Addis Ababa, Desse, Adama, Mekele, and Hawassa are potential buyers of wheat produced in the kebeles.
- **Bakeries-** Bakeries are also important actors in wheat value chain. They buy wheat from factories and bake bread and supply to consumers.

Support Actors

Support actors are those that provide support to main actors for well functioning of the value chain. WVC has the following support actors. The level of support of these actors determines the efficiency of the value chain.

- Research Institutes-regional and federal, particularly Sinana, Kulumsa, Adet, debre berhan, Areka, Alamata and Mehoni research centers.
- Woreda office of agriculture
- Transporters
- Grain enterprises-Grain enterprises are state owned ones that buy wheat from farmers and store it as emergency reserve. These enterprises play a greater role to control wheat prices volatility.
- Seed enterprises-These enterprises are both the Ethiopian seed enterprise and regional states seed enterprises. These enterprises play their support giving role in two major ways. The first one is by providing market access to farmers who produce seed with the required quality standard. The second one is through supply of seeds of improved varieties to farmers.
- Storage service providers-these are individuals that construct storage and provide rental services to traders and large scale farmers.
- Universities-Mekele, Medawelabu, Hawassa universities are the major ones conducting research in wheat.
- Financial services institutions (MFIs and Banks)-provide loan for wheat growing farmers and wheat traders.

iii. Major Constraints of Wheat Value Chain

Lack of crop storage facilities leading to post harvest pest and disease problems. Lack of knowledge about processing and functioning of processing equipment (e.g., harvesting, drying and grinding mills) are limited the opportunity for adding value. At the same time concerns were raised about low market prices, inadequate access roads, poor transport facilities and sometimes low demand for farm produce. Farmers often sell their crop soon after harvest to avoid pest damage, but when prices are low. Early selling is also necessary to ensure timely loan repayments with late payments attracting high interest rate penalties.

- Rising cost of inputs such as fertilizer, chemicals and seeds;
- Shortage of improved technologies;
- Rising cost of transport. This constraint mainly affect wheat grain traders;
- Seed quality problems;

- Market price fluctuations (farmers affected most and traders gain from market price fluctuations as traders are the price makers in the value chain)
- Diseases occurrence particularly wheat rust that devastate produces. There are wheat resistance varieties generated at Kulumsa agricultural research centers but these varieties are not yet reached to all wheat producing farmers because of capacity limitation to multiply the varieties.
- Occurrence of weeds that cannot be controlled using chemical currently available in the market.
- Quality of wheat grain. Impurities of wheat grain were mentioned as key problems by flour factories.

Barley Value Chain (BVC)

In spite of the importance of barley as a food and malting crop, the efforts made so far to generate improved production technologies and increasing productivity in production fields has remained very low (about 1.3 t/ha compared with the world average of 2.4 t/ha) (Yirga et al., 1998). This is primarily due to the low yielding ability of farmers' cultivars, which are the dominant varieties in use; the influence of several biotic and abiotic stresses; and the minimal promotion of improved barley production technologies.

i. Brief description of Barley Value Chain

BVC is also well developed value chain next to wheat. There are many actors in BVC. The actors involved in BVC are more or less the same to that of WVC. The main point of difference is there are smaller numbers of factories that process barley. There are two types of barley commonly grown by farmers. These are the malt barley and food barley. Malt barley production is very common in sinana woreda than any other woreda including in the study sites. Kulumsa malt barley factory located at Assela town provides market access to the surrounding farming communities. Farmers in Lemo, Endamehoni and Basona werana woredas mainly produce food barley. As new beer factory is being established at Maichew town, farmers in Endamehoni woreda would have good market access for malt barley in the near future.

ii. Barley Value Chain Actors

Main Actors

The following main actors of barley value chain were identified during the key informants' interview.

- **Farmers-** farmers in the studied kebeles can be classified in to malt barley and food barley producing farmers. Malt barley producers are those that have entered agreement with malt factories and premium prices are granted. This type of arrangement encourages farmers to engage in malt barley production. Such arrangement also provides good opportunities for factories to substitute imported malt barley and reduce their transaction costs. Such type of arrangement is common around Sinana woreda. Similar arrangements could be facilitated in another woredas where malt barley can potentially grow.
- **Collectors-**Food barley collectors are the same traders that come to the village to collect many other types of grains. These traders are not specialized for barley only. As a result malt food barley collectors usually collect the grain at times of harvest and also during slack season from village markets. Collectors are agents for traders at woreda, and other traders coming from major towns.

- **Traders at woreda town**-These traders have direct link with collectors. They buy all produces from collectors. Together with collectors they determine the price of produce at a given season.
- **Traders from major towns**- These traders have direct link with both collectors and traders at woreda town. These traders are powerful in the value chain, who determines the ultimate price of produce.
- **Assela malt barley factories**- The factory has established a scheme to buy malt barley from surrounding farmers. The factory pay premium price for malt barley producers to encourage them produces quality grain.
- **Consumers-major consumers of food barley are rural residents.** The consumption of food barley in towns is low compared to rural areas.

Support actors

Support giving actors to barley value chain are enormous like WVC. The support actors that are currently providing support to the value chain are agriculture office of the woreda through supply of technical support through extension system; seed enterprises both the federal and regional enterprises that are providing seed to the farming communities through cooperatives, woreda administration, store service providers, transporters, universities particularly Mekele, Meda welabu (Sinana-Bale Robe), wachemo (Hosana) universities, and private chemical traders.

iii. Main Constraints of Barley Value Chain

The following major constraints are identified as factors that affect BVC.

- Shortage of supply of disease resistant and high yield varieties
- Weed and pest occurrence
- low soil fertility and low soil pH
- poor soil drainage
- frost and drought
- Diseases, such as scald, net blotch, spot blotch and rusts
- Rising costs of transport
- Market price fluctuation

Most farmers are not able to access pesticide and fungicide in the nearby market. Problems of adulteration and selling after expiration dates were often mentioned. At present cooperatives are providing fertilizers but often at unaffordable prices. Farmer themselves are not also applying the recommended rate of chemicals which led to ineffectiveness of the chemical to control weed, diseases and pests. This problem is the same in all studied kebeles.

Key formal and informal institutions and actors

In all studied kebeles there are several institutions currently available. These institutions have different feature and purposes of establishment. These different types of institutions could be classified depending on their nature and purpose of establishment.

Governmental Institutions

Governmental institutions that are those institutions run and financed by government budget (e.g., agriculture office of the woreda, federal and regional agricultural research institutions, Ethiopian seed enterprise, woreda level cooperative promotion office, woreda and kebele administrations, health posts, women affair office, schools and Ethiopian commodity exchange). These institutions carry out activities related with generation and transfer of technologies, knowledge and information in crop livestock and trees. These governmental institutions are established with the purpose of promoting rural development particularly in improving farming practices to increase productivity of crops, livestock and trees enterprises in smallholder farming communities. The institutions mentioned above are available in all 8 kebeles included in the study sites.

The dissemination of Sufficient and on time information is essential for the proper functioning of the agricultural market. This means “information has a key role to play in agricultural development. It serves as a tool for communication between the actors, as the channel for assessing trends, and as the tool for shaping decisions by both producers and policy makers” (Kalusopa , 2005). The Ethiopia Commodity Exchange (ECX) is an organized marketplace, where buyers and sellers come together to trade, assured of quality, quantity, payment, and delivery. Ethiopian Commodity Exchange was established in April 2008 as a solution to the above mentioned problems of Ethiopian agricultural market. ECX vision is to create a coordinated and comprehensive market in the trade of agricultural products in Ethiopia. ECX mission is to connect all buyers and sellers in an efficient, reliable and transparent market by harnessing innovation and technology (ECX, 2009). Pertinent to the functions of promoting crop-livestock-tree mixed farming systems in each kebele, farmers training centers (FTCs) are very essential places to deliver extension services. At each FTC three Development agents (DAs) are deployed with a full time worker status. The DAs are trained either on crop science, livestock or natural resources management.

The current status of these FTCs is far from realizing their responsibilities and functions because of resource limitations and technical capacity of development agents. It is therefore imperative to strengthen the capacity of the FTCs and DAs to the effective implementation of any interventions aimed at promoting innovations in mixed farming.

The mandate, major thematic focus of interventions and major challenges of these institutions are summarized on the table below.

Table 2: Mandate of key governmental institutions and thematic focus of their intervention and their major challenges

Institutions	Mandate	Major thematic focus of interventions	Major challenges
Woreda Agriculture Office	<ul style="list-style-type: none"> Coordinate popularization and dissemination of technologies knowledge and information in crop, livestock, forestry¹ and natural resources management 	<ul style="list-style-type: none"> Disseminate knowledge and information on new technologies among farmers Identify and promote agriculture, livestock and forestry related best practices and innovation Multiply and distribute breeds/seedlings of various tree spp Facilitate procurement and distribution of agricultural inputs to farmers such as chemicals, fertilizer, seed etc 	<ul style="list-style-type: none"> Shortage of improved seed/breed/seedlings supply and hence unable to meet rising demand for improved technologies particularly of improved seeds, fodder trees and fruit trees. Climate change and variability that causes failure in technologies affected credibility of extension Occurrences of natural disaster such as hails/frost, landslides, diseases and pest which led to production losses Logistics shortage
Federal and regional agricultural research	<ul style="list-style-type: none"> Generate technologies and information on crop, livestock and trees, and undertake small-scale technologies popularization and dissemination activities 	<ul style="list-style-type: none"> Conduct experiments on farmers land and farmers training centers Provide trainings for agricultural experts and model farmers on the technologies generated 	<ul style="list-style-type: none"> Weak linkage with agriculture offices and other stakeholders, Limited adoption of technologies generated High research staff turnover and limited capacity to multiply seeds
Ethiopian seed enterprise	<ul style="list-style-type: none"> Multiply improved seeds 	<ul style="list-style-type: none"> Multiply mainly seed of cereals, pulses, oil crops, legumes. 	<ul style="list-style-type: none"> Limited financial and man power capacity Limited commodity focus in technology multiplication scheme
Cooperative promotion office	<ul style="list-style-type: none"> Organize and promote cooperatives- primary and secondary cooperatives 	<ul style="list-style-type: none"> Organize farmers into cooperative Provide technical support to cooperatives for their well-functioning 	<ul style="list-style-type: none"> Budget constraints Limited man power and staff turn over
Woreda and Kebele administration	<ul style="list-style-type: none"> Coordinate/oversee development of the woreda/kebele 	<ul style="list-style-type: none"> Every aspect of the social economic environmental and political development of the woreda/kebeles 	<ul style="list-style-type: none"> Resource limitation both manpower and financial Become tied with urgent assignment from zone/regions

¹ The mandate of disseminating forestry related technologies, knowledge and information of the woreda agriculture office will be transferred to the newly established ministry of environment and forestry. Therefore new government office mandated to doing activities in forestry will be opened soon at woreda level.

Government institutions which are based in the capital of zonal administration and regional state are also a stake in the development of the studied kebeles. Zonal office of agriculture usually carryout regular monitoring of activities in selected kebeles of the woreda and as a result provide technical and administrative support for woreda level office on various matters. Regional bureau of agriculture have also significant importance through regulations and policy issues. These higher level government institutions are very crucial to deal with and effectively address many of the challenges facing farmers of the studied kebeles. Many of the problems of the studied kebeles also require involvement of higher level government bodies within the respective regions. For example the supply of improved breeds of livestock and rising cost of fertilizer are some of the problems which need the involvement of higher level government institutions.

Non-governmental Institutions

Various local and international non-governmental organization are also key actors in the studied kebeles currently engaged in food security and natural resources management programs. NGOs implement program and project based activities for a duration of 3-5 years. These institutions are playing very crucial role to support the implementation capacity of local government and farmers institutions through the provision of technical and material support. Most of the NGOs use government structure to get their program activities done in farming communities they targeted. They most often use model farmers and development agents based farmers training centers.

Children fund, sustainable land management (SLM), SUNARMA (Basona werana), German Technical Cooperation (GTZ), Agriculture Growth Program (AGP)-program based intervention implemented by MoA and RBoA, GRAD, HABP (Household Asset Building Program), are the major non-governmental, institutions undertaking development interventions in the studied kebeles. SLM, AGP, GRAD, HABP are program/project based interventions that are being implemented through government offices but financed by donor institutions.

The NGOs operating in Gudo Beret and Goshe Bado Children Fund, AGP, SLM and SUNARMA. Children fund is an NGO carrying out program/project based natural resources management and development activities. It is mainly target Gudo Beret Kebele and is distributing tree seedlings particularly apple tree at a reasonable price to farmers. In Goshe Bado kebeles the only NGO based/NGO financed program/projects are SLM, AGP, HABP and SLM.

The NGO based program intervention being implemented in Embahasti and Tsibet kebeles are AGP, SLM, HABP, safety-net program, GTZ and GRAD. Safety-net program is implemented through office of agriculture of the woreda but the administration of resources and human resource is separated.

There are no non-governmental institutions available in Upper Gana and Jewa kebeles of Lemo woreda.

Farmer's Institutions

Farmer's institutions are those institutions established and managed by farmers for the purpose of promoting common interest and addressing problems. Primary cooperatives are the major farmer's institutions that are established by farmers at kebele level. Primary cooperatives are key supplier of agricultural inputs such as fertilizer, seeds, chemicals and other consumables. In all kebeles there is at least one multipurpose primary cooperative established to facilitate agricultural input supply.

In Gudo Beret there are specialized cooperatives such as irrigation and marketing cooperative that was established by a group of individual farmers who have access to irrigation water around their farm land. These irrigation and marketing cooperatives carryout management of common resources and link member farmers with market. In Goshe Bado kebele apart from the primary cooperatives, there are also honey producers cooperative.

The available farmer's institutions in Tsibet and Emba Hasti kebeles are primary cooperatives, irrigation cooperative, women association, association for people with disability, and saving and credit association. These farmer's institutions are key supplier of agricultural inputs and market information. The primary cooperatives are not well developed.

The main and only farmer's institutions available in Jewa kebele and Upper Gana kebeles are primary cooperative.

Multipurpose cooperative is the main farmers institutions available both in Illu-sambitu and selka kebeles. There are also quite large number of group based economic enterprises established for carrying out economic and social activities. These includes 'Banki midhani' farmer associations, Women vision credit and saving associations, Forest management associations, 'Tokuma' sheep fattening association, 'Safisa' seed multiplication association, 'Sofumar' seed multiplication association, 'Gudina' sheep fattening association, 'Lemlem' poultry production association, 'Biftu' poultry production association, 'Qeneni' Baltina women association, 'Hawi gudina' youth poultry association and Idir.

Informal Institutions

Idir is a key informal local institution in which member has tradition of exchanging information and knowledge of any kind. It is a social institution established with a prime purpose of addressing social needs and promotes common interest. These institutions also offer huge potential for promoting new ideas and information as the fidelity and bondage between members is quite strong. In every kebeles there are female-only members Idir as well as male-only members Idir. Idir as informal social institution has enormous potential for using it as effective tools for disseminating information as well as influence behavior and practice of member farmers.

Mass Media

Mass media is an institution that is playing immense role in changing farmer's attitude and knowledge by broadcasting scientific information and best practices to farmers in crop, livestock and trees. Local medias are playing an enormous role towards improving production and productivity. Interviewed farmers and key informants have mentioned that regional/local radio transmits at least every week important agricultural information and best practices obtained from other areas of the country and influencing attitude, knowledge and practices of local farmers.

- Farmers in emba hasti and Tsibet kebeles listen '*Dimitse weyane*' and '*national radio*'
- Farmers in Goshe bado and Gudo beret listen *Amhara region radio and television program and the national radio and television*
- Farmers in Jewa and upper Gana kebeles listen *Hawassa radio station and national radio*
- Farmers in Illu Sambitu and Salka kebeles listen *Adama radio station and the national radio* broadcasted in Oromifa language.

1-to-5 Development Group Structure

This is one of a structure that has similar status and functions as institutions, with potentially promote common interest and achieve desired goals in agricultural development in farming communities. It is a social networking but initiated and promoted by government, mainly for facilitating effective delivery of extension services to multitude farm households in a relatively short period of time. It is a group approach adopted by the government to consolidate the extension delivery system at grass root level.

The structure involves organizing farmers into what is termed as 'a 1 to 5 development group'. Each formed group has leader who is recognized as model farmer and has responsibilities on sharing knowledge, best practices and improved technologies obtained from any sources.

The structure is established in all kebeles of all regions of the country. The formed groups serve as a bridge to link among farming communities, extension system and external institutions. They believed to play the following key roles:

- It helps to reach multitude of farm families in a relatively short period of time;
- It empowers farmers to involve or take part from planning stage up to monitoring and evaluation of development intervention;
- It facilitates learning process, exchange and dissemination of best practices and experiences.
- Facilitate technology adoption. and
- Facilitate joint actions and promote innovations

Table 2: Strengths and weaknesses key institutions

Institutions	Major weaknesses	Major strengths
Woreda Agriculture Office	<ul style="list-style-type: none"> • High staff turnover • Weak monitoring of farm fields • Limited focus on promoting agro-forestry practices • Inadequate staff commitment • Weak linkage with various relevant institutions • Experts lack updated technical knowledge on their areas of specialization • Limited focus on documentation and promotion of local innovation • Farmers training centers are not fully equipped and not fully functional • Recently started promoting best practices through a strategy called scaling-up of best practices. 	<ul style="list-style-type: none"> • Serve every kebeles in the woreda • Regularly provide training for farmers on various subjects • Have structure at grass root level/kebele level to assist farmers through deployment of human resource-Development agents • FTC-farmers training centers are established in every kebele • Limited focus on issues of promotion of creating market access, post harvesting, and agro-forestry, and livestock etc <ul style="list-style-type: none"> • •
Federal and regional agricultural research	<ul style="list-style-type: none"> • Weak linkages with other institutions • Failure to effectively introduce/popularize new technologies and link up with other development institutions 	<ul style="list-style-type: none"> • Failure to closely work with farmers in a participatory manner • Working with small number of farmers • Supply limited amount of technologies • Maintain weak linkage with various stakeholders • Limited supervision and follow up of activities in the field • Limited focus on local innovation
Ethiopian seed enterprise	<ul style="list-style-type: none"> • Inability to multiply seed of released, highly demanded varieties; • Failure to maintain seed quality <ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Established out sourcing scheme that encourage farmers engage in seed production and buy from them • Serve every woredas in the country
Cooperative promotion office	<ul style="list-style-type: none"> • Low level of technical support to strengthen cooperatives • Limited financial and technical capacity to support both primary and secondary cooperatives 	<ul style="list-style-type: none"> • Clear policy and strategy to develop cooperatives • Staff commitment despite limited operational budget
Woreda and Kebele administration	<ul style="list-style-type: none"> • Engaging is diverse issues and lack focus/dilution of efforts 	<ul style="list-style-type: none"> • Regularly review/monitor and evaluate activities in the kebele
NGOs	<ul style="list-style-type: none"> • Short life span of projects • Working with small number of farm households 	<ul style="list-style-type: none"> • Strong follow up and monitoring of activities <ul style="list-style-type: none"> •
IDIR	<ul style="list-style-type: none"> • Focus only on social problems and no engaged in agricultural or economic development activities • Serve only small group individuals- 	<ul style="list-style-type: none"> • Members are highly affiliated to one another i.e high level of bondage among members; • Effective medium to share

	<p>small number of membership (25-40 members in each Idir)</p> <ul style="list-style-type: none"> Do not have written by-laws but governed by unwritten by-laws 	<p>information and knowledge among members;</p>
Mass media	<ul style="list-style-type: none"> Limited time coverage (in Limo woreda) Limited focus on broadcasting best practices in agriculture from other areas 	<ul style="list-style-type: none"> Broadcast agricultural information every week Interactive media specially in Sinana
Churches and mosques	<ul style="list-style-type: none"> Have potential but not currently engaged in development activities 	<ul style="list-style-type: none"> Have strong relationships with community members
Micro finance institutions	<ul style="list-style-type: none"> Unable to reach large majority of farm population with their scheme; inadequate follow up of beneficiaries 	<ul style="list-style-type: none"> Presence of MFIs in every woreda and serve most kebeles;
Universities	<ul style="list-style-type: none"> Carryout limited activities and have weak linkage with farmers, Do not regularly monitor activities 	<ul style="list-style-type: none"> Use participatory approach and encourage farmers participation;
Primary cooperatives	<ul style="list-style-type: none"> Have weak financial capacity and financial management system Do not regularly evaluate performances Have no or unclear plan for annual activities and no strategic plans. Fail to timely recruit and supply important agricultural input such as fertilizer and chemicals 	<ul style="list-style-type: none"> Serve every member of the kebele Provide services such as supply of agricultural inputs and other household consumables such as soap, sugar, salt etc
Unions	<ul style="list-style-type: none"> Does not regularly provide financial services and technical support to primary cooperatives and unable to strengthen them Limited technical and financial capacity and do not have strategic plan. Have maintained weak relationship with primary cooperatives 	<ul style="list-style-type: none"> Procure and supply fertilizer, seed and chemicals to primary cooperatives; Have annual plans (not strategic plan)
Zonal and regional agriculture bureaus	<ul style="list-style-type: none"> Allocation of inadequate budget for woreda office/DAs Limited technical support and facilitation of procurement of agricultural input timely 	<ul style="list-style-type: none"> Regularly visit woreda and model farms

Characteristics of 1-to-5 development group

Based on the discussions held with various key informants and some model farmers in studied kebeles, the following key characteristics of the structure are identified:

- The structures are formed on a voluntary basis, in a sense each member of the groups are tied together with the purpose of meeting common objectives of bringing about change in own life through adoption of modern technologies, practices and knowledge.
- Evaluation of performances of every individual member is key foundation of ensuring knowledge, information and technology shared among the members are applied properly;
- As all members of the kebele are organized into such group structure, it is effective way of disseminating new information, technologies and local innovations;
- It facilitates competitions among members of the group to look for new ways of doing things and sought solutions and as a result lay down fertile ground for innovation.
- Tend to be very effective to mobilize labor and resources and proved to be very effective means in natural resources management activities.

Key challenges and constraints of 1-to-5 development group

Based on the discussion held with development agents of respective woredas and experts from woreda offices revealed the following major challenges that are currently affecting functioning of the 1-to-5 institutions to serve their purpose of establishment:

- Due to over burden of various tasks and responsibilities being imposed from different government offices, leaders of the team tend to be fade up with and become less motivated to execute their responsibilities;
- Lack of commitment among group members to try out new knowledge and practices shared and lack of effective coordination with in groups;
- Some model farmers tend not to share some information they get from different sources.

Innovation platforms to address constraints of crop-livestock-tree mixed farming systems

The Need for Innovation Platform

The challenges and constraints identified by key informants and interviewed farmer's shows that the problems are complex and require the actions of several actors/institutions. Many of the problems were remained unsolved partly because the linkage between relevant actors working in the studied areas is weak. It is believed that IP help bring actors new ideas and practices to be tested and scaled-up. The platform also facilitates sharing of resource for common purpose. Establishment and use of IP in the studied kebeles have the following opportunities and challenges.

Opportunities

- Occurrence of several constraints and challenges undermining crop-livestock-tree mixed farming systems that requires joint actions of actors operating in the system.
- Interest of currently available institutions to collaborate and working together,
- Rising awareness among farmers to the need for participatory actions to address their problems;
- Increasing tendency among research and development institutions for participatory and multi-stakeholder actions.
- High commitment of local administration for promoting innovations and joint actions for bringing about rapid change in agriculture and also high level of commitment at all level in the hierarchy of government system from woreda to federal level.

Challenges

- Limited number of institutions and limited scope of their operation both in terms of area coverage and life span of their intervention particularly that of NGOs
- Limited financial resources, as the fund available for NGOs is declining and limited resources available in government institutions;
- Divers interests and several urgent and priority problems of the communities which cannot be addressed with available resources and in short period of time such as water shortage and infrastructural problems which directly and indirectly have impact on functioning of the major commodities value chains.

Modalities of Establishing Innovation Platforms

IPs can be established at different levels. At the local level, IP tend to focus on improving practices through joint experimentation and linking of farmers to markets and other stakeholders. At the national or international level, IP tend to have a policy development orientation, often on the basis of findings from activities taking place at the local level (Nederlof, 2011).

IPs to be established is to be commodity specific. However as it is also very advantageous to consider the whole farming systems and tackle major problems of the system, the following modality for establishing a platform for innovation development and promotion that targets the whole farming system.

Woreda Level Platform

The IP form to be established in the studied kebeles need to be the one that focus on both generating new ideas, technologies and practices and also scaling-up of such new ideas, technologies and practices to farmers. The platform need to be formed at woreda level as many of the actors are located at woreda level. The platform to be established can also serve all other kebeles of the woreda apart from the target ones. This paves the foundation for up-scaling best practices and innovations that will be generated through the platform.

Main Functions of Platform

- Identify and prioritize research and development agenda for the target kebeles;
- Identify, document and establish mechanisms for disseminations of local innovations;
- Identify major crop, livestock and trees productivity constraints and look for solutions and formulate and implement actions;
- facilitate farmers experimentations and local innovations;
- identify best practices and scale-up to wider communities;
- identify and recognize best farmers;
- device mechanisms and implement actions that promote agro-forestry practices;
- Facilitate timely and adequate supply of agricultural inputs to farmers in target communities.
- Generate workable policy ideas and communicate with policy makers

Steps to Establish IP and Ways Forward

Phase I

- Brainstorming the idea of establishing IPs together with different stakeholders' staffs at woreda, region and zone level government officials particularly administration offices and bureau of agriculture. There is a need to discuss on the modalities of establishing the platform and its structure. It is also very crucial to hold initial discussion with other key development actors in the woreda such as research institution and major NGOs so that they will bring various ideas and reflect their interest in the process of establishing the platform. The following points are important areas of brainstorming with key stakeholders:
 - The purpose of establishing the platform
 - Specific interests of the institutions in relation to the functions of the platform
 - Specific considerations need to be taken into account for establishing strong platform
 - Determine the consultative meeting day and venue and how to invite potential members of the platform;
 - Determine institutions that will form executive organ/committee of the platform

Phase II

Based on the agreements reached from the discussion with government officials, invite key actors mentioned in the previous section to discuss on the idea of establishing the platform. This will be done by organizing a consultative workshop that helps to discuss on the importance of the IP and harmonization of interest of invited actors. During the workshop the following key activities has to be done:

- Discuss with invited actors to identify any other relevant missing actors
- Determine the scope/mandate of the platform
- Facilitate the selection of executive committee members of the platform.

- Prepare by-law for the platform and discuss on it and get approval from potential member stakeholder. The by-law need to include accountability principles for which signatory actors will be abided by.
- Prepare and send letter of membership for institutions agreed with the by-law.

Phase III

Assess the performance of innovations in terms of new practices, new institutions, capacity needs, technologies developed, market linkages created, and information and knowledge flows etc. This is done in conformity with the mandates and functions of the IP.

Mechanism for Cross visit (experience sharing visit) farmer at different regions

There is a need to establish a mechanism by which best practices of one IP in one region for instance in Tigray to be exchanged or shared to IPs in other regions such as Oromia, SNNP or Amhara. Arranging regular exchange visit will help to facilitate experience sharing between regions. The prime purpose of establishing platforms is to generate new ideas and practices and facilitate their dissemination by various feasible mechanisms. One of the mechanisms is organizing exchange visit of farmers, experts and other stakeholders involved in the process. The innovation platform to be established has to embrace important national level institutions that can assume responsibility of organizing exchange visits. The Ministry of agriculture need to be invited to become a member of the IP at each region and regional bureau of agriculture. As the promotion of the best practices is institutional mandate of the regional bureaus and ministry of agriculture, the cost of such arrangement will need to be covered by these institutions.

Execution of Activities of the Platform

The different activities such as trials of germplasm introduction and demonstration will be carried out at FTCs and on fields of model farmers. Farmers whose land is used for such purpose will be invited to be a member of the platform. The report on the results of the activities carried out on farmers land as FTCs will be compiled and presented during the regular meeting of the IP. Development agents of the FTC and agriculture experts at respective woreda will take joint responsibility for compiling reports and presenting findings during the platform regular meeting. Model farmers will also be encouraged to present their findings to the platform.

Advantages and disadvantages of using model farmers

Model farmers are recommended to be used for implementing trials and demonstrations. The use of models farmers have potential merits and demerits that need to be taken into consideration.

Merits

- Model farmers are innovative and early adopters of new ideas and technologies who are convenient for getting new technologies tried;
- Most often willing to collaborate and can afford failure/losses;
- Model farmers are influential in any communities and can facilitate technology adoptions

Demerits

- May not represent the major segment of the community in terms of socioeconomic and wealth status and risk behavior;
- May not be willing to share knowledge and new technologies to follower farmers;
- May lack commitment to lead follower farmers and lack interest to work with small farmers and poorest of the poor because of difference in social status

Members of the platform

The platform needs to include the following institutions/individuals as members:

- Selected farmers/leaders of development team (in each kebele 30-50 development teams are formed)
- Woreda agriculture office;
- Development agents;
- Woreda and kebele administrations;
- Women affair office of the woreda-very important actor to oversee mainstreaming of gender in all areas of interventions and provide technical assistance advice to the platform members;
- NGOs operating in the woreda;
- Microfinance institutions;
- Transport associations;
- Traders located in the woredas;
- Factories/processing factors such as malt barley, flour factories;
- Zonal agriculture office;
- Cooperatives-both primary and Unions
- Individual firms that supply fungicide and herbicide
- The newly established ministry of environment and forestry at woreda level;
- Universities and research institutions; and
- High schools/primary schools.

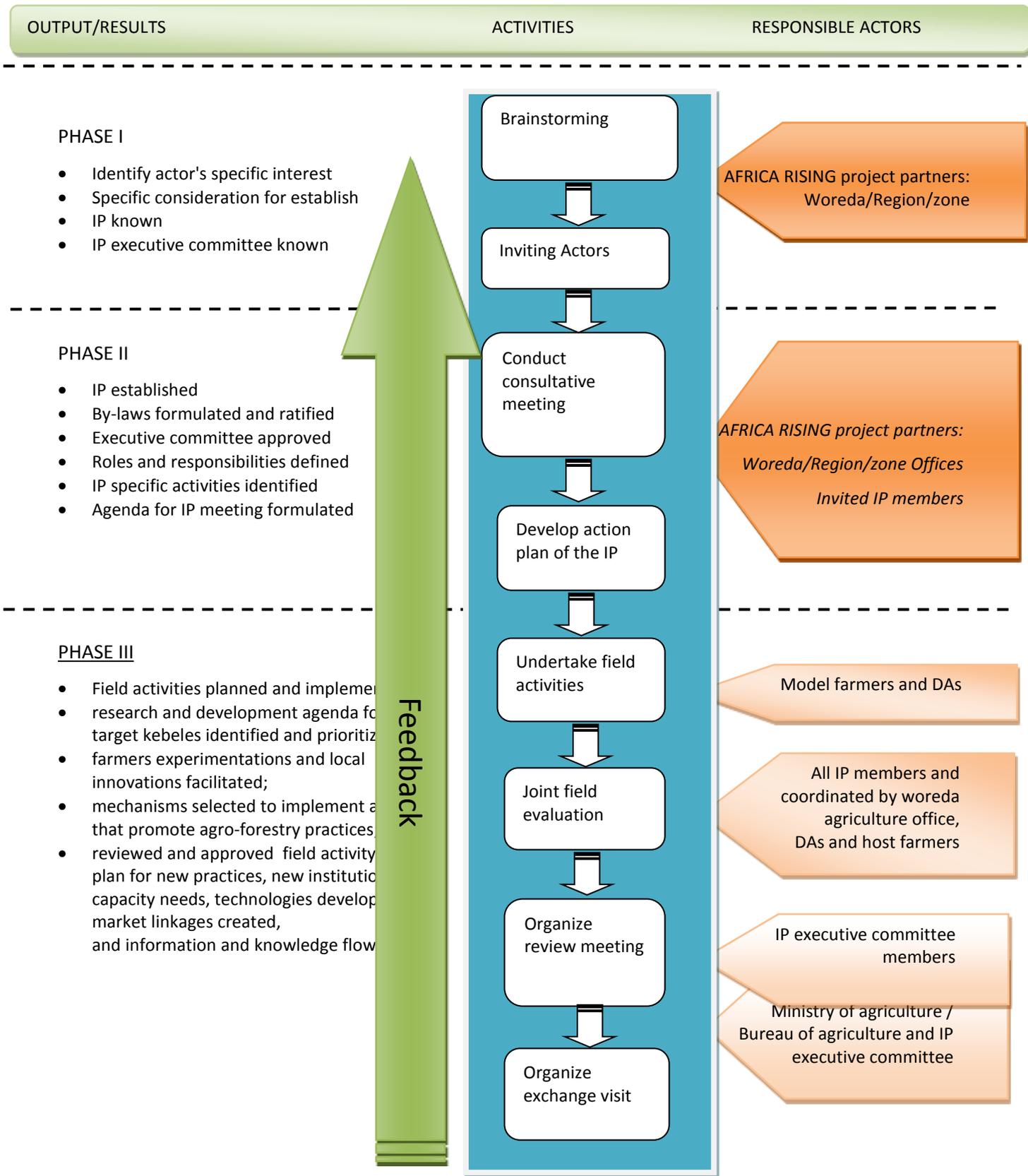


Figure 2: Major steps and processes in establishing and Operationalizing Innovation platform

Platform executive committee members and responsibilities

The platform needs to be coordinated by a committee which consists of representatives of 5-7 key institutions. As an alternative to the committee, two or three member actors/institutions of the platform whose role are significantly high to address the stated objectives of the platform may assume coordination position to the platform.

Time and frequency of Meeting of platform members

Unless and otherwise an issues that call for an urgent meeting occurred the platform will meet twice a year. The first meeting will be before planting and the second one is before harvesting. The purpose of the first meeting is to review planned activities and to discuss of all possible joint actions among platform members. The first meeting will also help to discuss and recommend every action to facilitate timely delivery of all the necessary inputs. The second meeting helps to discuss on and evaluate performance planned actions of platform members.

Documentation of Best Practices and Use of Media

Most often best practices generated in one place are not known in other communities or villages simply because of lack of information about the existence of the practice. Key informant interview at woreda level revealed such facts that little attention given to documenting best practices and subsequent failure to communicate to wider public is one of the critical weaknesses of most institutions engaged in rural development activities. Ideas and new practices that are generated through the platform therefore; need to be communicated to the wider community. The new ideas and practices are to be therefore; properly analyzed and documented for wider circulation beyond the project area. The documentation process has to be done by members of the platform every year (if possible) and need to be communicated before every production season. The features and the new practices have to be also disseminated to the wider communities around the country through print and broadcasting media. Inviting media institutions to be permanent member of the platform help to address such issues.

Conclusions and recommendations

Crop and livestock enterprises are the major livelihood and supplementary cash income sources for farmers in the studied areas. The trend in the importance of these livelihood sources are still increasing from time to time despite the existence of several factors that undermine their productivity. Despite the increasing importance of these enterprises to livelihood, the demand of farmers to improved technologies is far from being met. Farmers face different challenges and have diverse needs. Hence, in addition to matching or providing options/technologies to farmer contexts we have to consider the delivery mechanisms. The various constraints that affect crop, trees and livestock productivity are complex and require concerted efforts of institutions engaged in the generation and transfer of technologies. The lack of mechanisms that can bring actors together to look for solution jointly to most of the complex problems prevailing in the farming system is identified as a one of the bottle necks to bring about improvement from the efforts of institutions involved in development activities in the study areas.

There is limited effort so far done by available institutions to promote integrated agricultural practices. This calls for design and implementation of various intervention programs that aim at improving existing technologies and agricultural practices that address farmers interest and create awareness and knowledge based trainings for farmers and extension workers. There are huge potential opportunities to the use of innovation platforms as many actors involved in agricultural development activities in the studied kebeles have keen interest for collaborative actions. The IP is very crucial to build new partnerships amongst the various stakeholders (research institutions, extension, policy makers, farmers, higher education, private sectors etc...) to co-learn, plan and implement joint research and development activities to address long standing problems of the farming systems of the studied kebeles. It will enable to monitor performances to see and evaluate what works well in different contexts. The innovation platform can be established mainly at Woreda level with innovation networks at Kebel level. There is the need to look at Innovation platforms dynamically and pay more attention to mechanisms that strengthen feedback, learning and adaptive management in innovation processes.

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Annex 1: Major livelihood sources and priority rank

Endamehoni woreda		Basona werana woreda		Sinana woreda		Lemo woreda	
Livelihood sources	Rank	Livelihood sources	Rank	Livelihood sources	Rank	Livelihood sources	Rank
Crop	1 st	Crop production	1 st	Crop	1 st	Crop	1 st
livestock	2 nd	Livestock	2 nd	Poultry	1 st	Livestock	2 nd
Non-timber forest products	3 rd	Eucalyptus	3 rd	Petty Trading	1 st	Off farm activities	3 rd
Off-farm casual labor	4 th	Off farm casual labor	5 th	Equine (mainly for carts)	1 st	Cereal trading	4 th
Cereal trading	6 th	Cereal trading	4 th	Ox for draft power and fattening	2 nd	Eucalyptus	5 th
Local beverage	7 th	Cloth making	7 th	<ul style="list-style-type: none"> Cow (cow milk) 	2 nd	Local beverage	6 th
eucalyptus	5 th	Local beverage	6 th	<ul style="list-style-type: none"> Sheep 	3 rd	Kiosks	7 th

Annex 2: Land coverage of four priority major crops

Name of Kebeles	Kebeles	Major crops	Land coverage (Ha)
Endamehoni	Emba hasti	Barley	403.25
		Wheat	181
		Faba bean	92.87
		Field pea	65.75
	Tsibet	Barley	330.5
		Wheat	307
		Faba bean	143
		Lentil	79
Basona werana	Gudo Beret	Faba bean	330
		Barley	318
		Wheat	280
		Field pea	102
	Goshe bado	Wheat	302
		Faba bean	250
		Tef	200
		Chick pea	90
Sinana	Selka	Wheat	1928
		Barley	320
		Field pea	310
		Faba bean	291
	Illu-Sambitu	Wheat	3088
		Barley	422
		Emmer wheat	329
		Field pea	48
Lemo	Jawe	Wheat	420
		Tef	236
		Potato	76
		Faba bean	70
	Upper Gana	Wheat	520
		Tef	340
		Enset	330
		Faba bean	105

Annex 3: List of Institutions promoting crop-livestock-tree development in Illu-Sambitu and Selka Kebeles of Sinana woreda

Emba Hasti and Tsibet Kebeles (Endamehoni woreda)	Goshe Bado and Gudo Beret Kebeles (Basona Werana woreda)	Illu Sanbitu and Selka Kebeles (Sinana woreda)	Upper Gana and Jewa Kebeles (Lemo Woreda)
<ul style="list-style-type: none"> • Agricultural office • AGP • Mehoni Agricultural Research center • GRAD/MERET • HABP • Safety net program • SLM • GTZ • Primary cooperatives • Kebele and woreda administration • Regional and zonal agriculture bureau • Mekele University • Saving and credit association • Irrigation association • Cooperative promotion office of the woreda • Women and youth association • Women affair office of the woreda • Association for people with Disabilities • Various income generating groups being promoted by AGP*** 	<ul style="list-style-type: none"> • Woreda agriculture office • Woreda administration • Kebele administration • FTC • Women affair office • Irrigation and marketing cooperatives • Honey producers cooperatives (Goshe Bado kebele) • Children Fund (Gudo Beret) • SUNARMA • SLM • HABP • AGP • Various income generation groups being promoted by AGP*** 	<ul style="list-style-type: none"> • Sinana Agricultural research center • Woreda Agricultural offices • Sinana Agricultural State Farm • Ethio-Italia Cooperation • ICARDA • AGP • ATA • Farmers Cooperatives • PAs animal health clinic • Kebele Administration • Private animal drug suppliers • Women affair office of the woreda • Various Income generation groups*** 	<ul style="list-style-type: none"> • Wachemu University • Southern Region seed enterprise • ESE • AISCO • Farmers primary cooperatives • Hadiya Cooperative Union • Areka agricultural research center • Kebele administration • Woreda administration • Farmers Training Center • Ethiopian Commodity Exchange • Zone and regional agriculture bureau • Omo micro finance • Farmer Training Center • Woreda agriculture office • Werabe Poultry center • Churches • Various income generation groups being promoted by AGP***

*** Various income generation groups are groups formed by AGP in which a group of youth and household head individuals are engaged in income generation activities using the seed capital they get from AGP. These groups are found in all studied kebeles