منظمة الأغذية والزراعة للأمم المتحدة
联合国粮食及农业组织
Food and Agriculture Organization of the United Nations
Organisation des Nations Unies pour l'alimentation et l'agriculture
Продовольственная и сельскохозяйственная организация Объединенных Наций
Organización de las Naciones Unidas para la Alimentación y la Agricultura

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Our Ref.: UTF/ETH/081/ETH

Your Ref.:

Excellency,

I have the honour to refer to project UTF/ETH/081/ETH "Technical Support for Agricultural Growth Programme (AGP)" financed by the Government of Ethiopia.

Please find herewith six copies of the terminal report, providing its main findings and recommendations.

I look forward to continuing and further strengthening this collaboration and would like to take this opportunity to express my appreciation to the Government of Ethiopia for its continued support to the goals and priority activities of the Organization.

Accept, Excellency, the assurance of my highest consideration.

Gustavo González
Director
South-South and Resource Mobilization Division
Technical Cooperation Department

His Excellency
Ambassador
Permanent Representative of the Federal
Democratic Republic of Ethiopia to FAO
Embassy of the Federal Democratic Republic of Ethiopia
(Office of the Permanent Representative to FAO)
Rome

Food and Agriculture Organization of the United Nations

TC:UTF/ETH/081/ETH
Terminal Report

FAO/UNILATERAL TRUST FUND

TECHNICAL SUPPORT FOR AGRICULTURAL GROWTH PROGRAMME

ETHIOPIA

PROJECT FINDINGS AND RECOMMENDATIONS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

ROME, 2017

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ETHIOPIA

PROJECT FINDINGS AND RECOMMENDATIONS

Report prepared for
the Government of Ethiopia
by
the Food and Agriculture Organization of the United Nations

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2017

The Food and Agriculture Organization is greatly indebted to all those who assisted in the implementation of the project by providing information, advice and facilities.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

AGP	-	Agricultural Growth Programme
AGP-I	-	First Agricultural Growth Programme/Project
AGP-II	-	Second Agricultural Growth Programme/Project
ATVET	-	Agricultural Technical Vocational Education and Training
CIG	-	Common Interest Group
DA	-	Development Agent
DP	-	Development Partner
FFS	-	Farmer-Field School
FTC	-	Farmer Training Centre
GAFSP	-	Global Agriculture and Food Security Programme
GTP	-	Growth and Transformation Plan
IA	-	Implementing Agency
IPM	-	Integrated Pest Management
IPM-FFS	-	Farmer-Field School for Integrated Pest Management promotion
JRIS	-	Joint Review and Implementation Support
M&E	-	Monitoring and Evaluation
MoANR	-	Ministry of Agriculture and Natural Resource
MoLF	-	Ministry of Livestock and Fisheries
NGO	-	Non-governmental Organization
PDO	-	Project Development Objective
PMU	-	Project Management Unit
PRH	-	Population and Reproductive Health
RED&FS	-	Rural Economic Development and Food Security
SE	-	Supervising Entity

SLMP	-	Sustainable Land Management Programmed/Project
SMS	-	Subject Matter Specialists
SNNPR	-	Southern Nations, Nationalities, and Peoples' Region
SWG	-	Sector Working Group
TA	-	Technical Assistance
TCs	-	Technical Committees
ToT	-	Training of Trainers
TS	-	Technical Support
TS-AGP-I	-	Technical Support to Agricultural Growth Programme-I
WB	-	World Bank

A. OVERVIEW

A.1 PROJECT PROFILE

Country	Ethiopia
Project Symbol	UTF/ETH/081/ETH
Project Title	Technical Support for Agricultural Growth Programme (AGP)
Resource Partner	Global Agriculture and Food Security Programme (GAFSP)
Actual EOD	3 September 2012
Actual NTE	31 December 2016
Participating Organizations (e.g. Ministry of Agriculture, etc.)	Ministry of Agriculture and Natural Resources (MoANR), Ministry of Livestock and Fisheries (MoLF)

Implementing Partners (List):

Name	Type (NGO/Community Based Organization/Gov.)	Total Funds Transferred

Contribution to FAO's Strategic Framework ***Indicate the title of each higher level result to which the project contributes***	
Organizational Outcome(s)	
Regional Priority Area/Initiative	
Country Programming Framework Outcome(s)	
UNDAF Outcome(s)	

A.2 FINANCIAL DATA in USD[1]

(as at: 11 April 2017)

Budget	USD 1 500 000
Cash received	USD 1 500 000
Delivery	USD 1 341 915

[1] Data source: FPMIS/ Data Warehouse

A.3 EXECUTIVE SUMMARY

The Project Development Objective (PDO) of the Technical Support to the Agricultural Growth Program-I (TS-AGP-I) aimed at ensuring more effective, inclusive and country-owned livestock development, with particular focus on forage development and the promotion of an Integrated Pest Management (IPM) programme, through strengthened national capacities of the implementing institutions. The PDO of the Agricultural Growth Programme ([AGP] the Associated Investment Project) was to increase agricultural productivity and market access for key crop and livestock products in targeted woredas, with increased participation of women and youth. The first immediate objective was to improve human and organizational capacities to incorporate sustainable, intensified livestock production into integrated watershed development, in particular, by male and female smallholder farmers. The second immediate objective was increased adoption of IPM approaches in Ethiopian crop production. This would be achieved through the implementation of two outputs: i) Output 1: Enhanced organizational and human technical capacities in sustainable, intensified livestock production enhanced at federal, regional and woreda levels; and ii) Output 2: Enhanced organizational and human capacity of the Ministry of Agriculture and Natural Resources (MoANR) and the Ministry of Livestock and Fisheries (MoLF) to plan and implement IPM programmes.

Training was provided to 6 256 beneficiary farmers on forage production and management, including specialized training activities on forage seed production schemes. A total of 10 679 665 seedlings of various forage tree species were planted and integrated in a 585.60 ha of watershed areas. This contributed to increased biomass, enhancing the supply of feed for livestock and carbon sequestration, and reducing the impact of greenhouse gas emissions. This activity also improved the quality and quantity of feed supply, contributing to improving soil fertility, and soil and water conservation, reducing soil erosion and rehabilitating degraded lands.

Intensive training was provided on forage production and utilization to Subject Matter Specialists (SMS) and Development Agents (DAs), which was designed on the basis of the capacity gaps identified. As a result of the training courses improved extension services were delivered to smallholder farmers.

Exposure visits and peer learning were organized for 462 SMS and DAs from the project woredas, to increase the adoption and implementation of improved technologies and practices. Similar exposure visits were conducted for 4 764 farmers, facilitating the learning process with peer groups from different localities, and/or within the same locality.

Two training manuals were developed on the basis of the capacity gaps identified, which were published and distributed to implementing institutions and all AGP woredas. These will be used by DAs to deliver effective and efficient extension services to smallholder farmers.

Intensive training activities were organized for 1 007 SMS and 280 DAs on IPM principles and techniques, and their implementation. Training was also provided to 2 385 beneficiary farmers, encouraging the adoption and implementation of recommended IPM technologies and practices. In addition, 20 specific crop-pest combinations were identified, prioritized and implemented, and the recommended IPM practices were used for eight crop pest combinations, with the active involvement of the beneficiary farmers, who were organized under IPM-Farmer Field School (FFS) groups.

B. RELEVANCE

The problem

Agricultural growth is fundamental to the overall development of Ethiopia. The country's agriculture is dominated by smallholder and largely subsistence farming, with low productivity on fragmented and highly degraded lands. Leading the sector to higher productivity and increased commercialization is fundamental for poverty reduction and food security, and will also contribute significantly to the country's vision of achieving middle income status.

The response

The PDO of the TS-AGP-I aimed at ensuring more effective, inclusive and country-owned livestock development, with particular focus on forage development and the promotion of an IPM programme through strengthened national capacities of the implementing institutions. The PDO of the AGP (the Associated Investment Project) was to increase agricultural productivity and market access for key crop and livestock products in targeted woredas, with increased participation of women and youth.

The first immediate objective was to improve human and organizational capacities to incorporate sustainable, intensified livestock production into integrated watershed development, in particular, by male and female smallholder farmers. The second immediate objective was increased adoption of IPM approaches in Ethiopian crop production. The planned project outputs were as follows:

- Output 1: Enhanced organizational and human technical capacities in sustainable, intensified livestock production enhanced at federal, regional and woreda levels.
- Output 2: Enhanced organizational and human capacity of MoANR/MoLF to plan and implement IPM programmes.

The direct project beneficiaries were smallholder farmers who were actively engaged in crop-livestock production systems in pilot AGP-supported woredas. Priority was given to women and youth.

C. ACHIEVEMENT OF RESULTS

Results achieved

The project consisted of the following two components: i) Component 1: Livestock; and ii) Component 2: IPM. The main project achievements and results are summarized below. The activities are organized on the basis of the order outlined in the Project Result Framework (see Appendix 1).

1. Cross-cutting activities

1.1 Ensure alignment/planning/Monitoring and Evaluation (M&E)

1.1.1 Consultations with AGP/Project Management Unit, Livestock and Population and Reproductive Health directorates

Following consultations with AGP-Project Management Unit (PMU), and Livestock and Population and Reproductive Health (PRH) directorates, the annual project activities were finalized and aligned with the annual planning activities of AGP-I.

1.1.2 Annually align work plan with AGP

During project implementation FAO established strong linkages, which were effectively coordinated with AGP-I and other parallel initiatives, and shared experiences with various initiatives through annual planning and review meetings. FAO also distributed and published technical materials to Implementing Agencies (IAs) and other key stakeholders, and shared progress reports.

1.1.3 Visit activity sites for consultations with regions/woredas for coplanning/M&E

This activity involved regular participation in the Joint Review and Implementation Support (JRIS) mission representing FAO Ethiopia, and the AGP Technical Committee (TC)

meetings, to ensure the alignment and effective coordination of the TS project with the overall AGP-I project activities.

1.1.4 Regular reports (monthly, quarterly, semi-annual, annual, and completion)

During the project implementation period, FAO produced and submitted eight six-monthly progress reports and five annual reports, including this terminal report.

FAO also facilitated the process of peer-reviewed and technically cleared short-term consultant reports, which they distributed to the implementing institutions (MoANR and MoLF), and other key stakeholders (World Bank [WB], Rural Economic Development and Food Security [RED & FS]).

1.1.5 Monitor and collect feedback from implementing partners (through monthly communication)

The project coordination unit collected monthly project implementation progress reports from the project woredas through telecommunication. Based on the field information collected, feedback was also provided, helping to strengthen project implementation.

2. Component 1: Livestock

2.1 Livestock feed development

2.1.1 Forage seed multiplication and demonstration sites

Provide training to farmers

Training was provided to 6 256 beneficiary farmers on forage production and management, including specialized training activities on forage seed production schemes. The number of farmers was much higher than the originally planned 1 100, as a result of the coordinated efforts of the project woredas and DAs in the project sites.

Forage demonstration activities were established and implemented in the 138 selected Farmer Training Centers (FTCs), covering an area of 51.26 ha; while Common Interest Group (CIG) and individual farmers' fields included an additional 929 smallholder farmers, covering a total area of 419.60 ha. Overall, the forage development activities were successfully demonstrated in all ten pilot woredas (see Appendix 3 for details) identified for forage development interventions.

Fig. 1. Partial view of improved forage crops established for demonstration and seed production at Aruma FTC, Wondo Genet, Southern Nations, Nationalities, and Peoples' Region (SNNPR)

Sample forage interventions demonstrated in one of the FTCs are illustrated in the photographs above (fig.1). A total of 3.820 tonnes of start-up forage seed of different species, carefully selected to suit the different agro-ecologies, were procured and distributed to project woredas for demonstration, to kick start forage development activities.

The project effectively demonstrated the growing of improved forage crops, both grass and leguminous species, and introduced and promoted forage planting material production and multiplication systems, through which a total of 10 679 665 seedlings of various forage tree species/splits of grasses were multiplied and distributed.

Establish school forage schemes

The planned establishment of school forage schemes was not achieved, because schools were usually closed during the main rainy season. In this case, it was not possible to involve students in forage development activities under the rainfed programme.

Provide technical support and backstopping (one visit/quarter)

All sixteen planned on-site technical backstopping support services were provided to the project woredas at least once every quarter, through which project implementation was closely supported. Local level training sessions were facilitated by DAs, who received training; and advice to field staff on technical matters was provided through field supervision missions. The regular technical backstopping helped project regions and woredas to address problems they encountered, and implement project activities smoothly.

Fig. 2. Fodder beet (right) and vetch (left) sown at individual farmers' plots in Yaya Gul

2.1.2 Integration of forage development in selected watersheds

Forage tree species were integrated with watershed development programmes in selected watersheds. These were practically demonstrated, and effectively integrated in all the planned 25 watersheds (for details see Appendix 3). A total of 10 679 665 seedlings of various forage tree species, such as tree lucerne, sesbania, pigeon pea, elephant grass and vetiver grass, were planted and integrated in 585.60 ha of watershed areas.

Fig. 3. Pigeon pea integrated with watersheds at Welkie watershed (left and centre) and Yemlo (right), Efratana Gidim, Amhara

Fig. 4. Alfalfa integrated with apiculture on a farmer plot in Wendo-Genet Woreda, SNNPR

Fig. 5. Tree lucerne seedlings at Mush nursery, Gudo Beret Kebele, Basona Werena Woreda, Amhara

Fig. 6. Integrated forage-watershed development effort in Goshe-Bado Kebele Basowerana Woreda, Amhara

This activity contributed to increased biomass, and in some cases was integrated with beekeeping activities. This helped the bee colonies to remain in one area, with forage nearby, eliminating the need to travel to distant places to collect nectar and pollen for honey production. The increased biomass production enhanced the supply of feed for livestock through the adoption of a cut and carry system used for strategic feeding of fattening animals and dairy cows, which increased livestock productivity, as per the report of the project woreda (Basona Worana Woreda in Amhara Region).

In addition, the quality and quantity of feed supply was enhanced, contributing to improving soil fertility, and soil and water conservation, reducing soil erosion and rehabilitating degraded lands. The increased biomass will enhance carbon sequestration, and reduce the impact of greenhouse gas emissions.

Fig. 7. Awareness creation training on integration of forage into watershed development to community members at Goshebado Kebele in Basona Werana Woreda, Amhara region

2.1.3 Provision of training to SMS/DAs in the area of livestock feed production and management

Intensive training was provided on forage production and utilization to SMS and DAs, which was designed on the basis of the capacity gaps identified. A total of 1 001 SMS and DAs were trained, which was a substantial increase in the 166 experts envisaged during the planning stage. The main reason for this was the increased geographic area, particularly for Training of Trainers (ToT), which covered all 96 AGP-I supported woredas (not only the ten pilot woredas), where forage development activities took place with project support. As a result of the intensive training activities, improved extension services were delivered to smallholder farmers. They also enabled woreda experts to provide training independently, as observed during mentoring.

2.1.4 Exposure visits for SMS and extension workers

Exposure visits and peer learning were used as didactic tools to facilitate increased adoption and implementation of improved technologies and practices. The main learning activities consisted of effectively integrating forage development activities with a crop production system, and natural resource management in the case of the integration of forage development activities with watershed development programmes, which were demonstrated in selected watersheds.

Local level exposure visits on improved forage production and management were conducted at different localities and at different times, involving 462 SMS and DAs from the project woredas. At least one or two experience sharing events were organized per woreda.

The lessons drawn were increased awareness on improved forage seed production and vegetative production systems, effectively mobilizing farmers for successful forage production, and the need for integration with key livestock production systems.

2.1.5 Farmer exposure visits

Similar exposure visits were conducted for 4 764 farmers, which facilitated the learning process with peer groups from different localities, and/or within the same locality, of interacting with, and learning from each another. They brought about attitudinal changes, and increased farmers' perceptions by allowing them to observe the successful implementation of various forage development strategies integrated with the farming system. It also provided evidence for improved adoption of best practices, and farmers then implemented these techniques in areas with similar settings.

2.1.6 Prepare animal nutrition and forage production training materials/guidelines

- *Publish training materials/guidelines and distribute*
- *Guidelines/factsheets on new forage species (print and distribute)*

A training needs assessment was conducted to identify capacity gaps and design appropriate interventions. Two training manuals titled Forage Production, and Ration Formulation and Feeding Guidelines were developed, based on the capacity gaps identified, in close consultation with stakeholders from federal to project woreda levels. These were further enriched by the field experience gained during the project. The manuals were published and distributed (1 000 copies) to implementing institutions and all AGP woredas. They will be used as reference and training support materials by DAs, to deliver effective and efficient extension services to smallholder farmers. The content is also suitable for the provision of skills-based training at higher learning institutions and Agricultural Technical Vocational Education and Training (ATVET) colleges, which will train future DAs. Private forage seed enterprises, associations, livestock producers and other key stakeholders can also use the manuals as reference materials.

2.2 Livestock policy

2.2.1 Prepare forage production and multiplication systems, and livestock extension for Ethiopia

- *Conduct consultation workshop on draft policy and strategy*
- *Produce final proposals, get clearance from FAO and hand over to MoANR, MoLF, and other key stakeholders*

This activity was changed slightly from the original plan, following close consultation with the livestock subsector of MoANR. It was advised to focus on a forage production strategy and livestock extension system, which was deemed more relevant.

A review of the Ethiopian livestock sector was conducted with the support of an international consultant, and in close consultation with stakeholders. Gaps were identified and two policy documents titled "Forage Production and Multiplication System for Ethiopia" and "Livestock Extension System in Ethiopia" were developed. These were then peer reviewed by the respective technical unit, cleared by FAO, and handed over to the implementing ministries MoANR and MoLF for implementation, in order to strengthen the livestock sector. They were also distributed to other key stakeholders. It is the first time that a livestock extension system study has been developed for the new MoLF, and it is expected to be of great use to the Ministry.

3. Component 2: IPM

3.1 Prepare basic IPM implementation-related documents

IPM implementation policy, strategy and road map/guidelines (International Consultant)

IPM is a scientific approach to pest management that integrates biological, cultural, mechanical and chemical application control methods to control crop pests. The IPM programme aimed to adopt and promote effective practices in order to reduce: i) crop losses caused by pests; and ii) risks to people and the environment, by using pest biology, environmental information, and all available technology to bring pest damage down to acceptable levels, using the most economical means.

Long-term and sustainable adoption of IPM by smallholder farmers will only be successful if information and knowledge of IPM principles and technology are available to them. To this end, a needs assessment was conducted in project regions and woredas (see Appendix 3) to identify gaps and possible entry points to integrate IPM practices into improved crop management in smallholder agriculture. Subsequently, an international short-term consultant developed an IPM implementation strategy for Ethiopia, which was peer reviewed and cleared by FAO, and the final report was submitted to MoANR.

3.2 Conduct capacity-building assessment

The IPM approach is new to professionals and beneficiary smallholder farmers in Ethiopia, and the capacity to effectively adopt and implement IPM is limited. Therefore, an initial capacity-needs assessment was carried out in the project areas through the national IPM consultant, in close consultation with the project woredas. The capacity gaps identified included inadequate knowledge on IPM principles, techniques and tactics, limited knowledge on an agro-ecosystem-based approach as the basis for IPM implementation, and no in-depth knowledge on the proper handling and safe use of pesticides for pest control.

In parallel to the needs assessment, baseline information on existing crop production practices, major crops grown and the pest situation was gathered; and constraints and challenges were collected, analysed and documented.

3.2.1 Prepare training materials

Finalize, print and distribute IPM training manual for experts, DAs and farmers

Based on the capacity gaps identified, FAO developed the national IPM guidelines for experts, and drafted a simplified version for DAs, to support training activities to beneficiary farmers organized under IPM-FFS groups. In particular, the national IPM guidelines for SMS were refined on the basis of the field practical experience gained during the project. The training materials were peer reviewed and cleared by FAO, and published and distributed to MoANR and other key stakeholders, to be used for scaling up IPM practices on a wider geographic scale.

3.2.2 Strengthen and/or establish farmers groups on IPM-FFS in the fourteen target woredas (three/woreda)

Establish IMP-FFS on identified crop-pest combinations

IPM was promoted using the FFS approach, which actively involved interested farmers, who shared experiences with IPM-FFS members, and effectively utilized the recommended IPM technologies and practices, strongly integrated with an improved crop production system. Seventy two IPM-FFS groups (an increase in the originally planned 46 groups) were established and operational in all the 14 pilot woredas implementing IPM. In each IPM-FFS group, 20 interested farmers acted as members, and the groups were organized around specific crop-pest combinations. They were fully functional and effectively managed season-long activities. In most cases they continued during the subsequent seasons, and in some cases during the irrigation seasons.

Fig. 8. IPM-FFS groups engaged in pest monitoring activities at Yaya Gulelie, Oromiya

3.2.3 Provide training to experts, DAs and farmers

- *Conduct training on IPM principles for experts*
- *Training on IPM implementation facilitation for DAs*
- *Provide training to members of IPM-FFS (20 per FFS)*

Intensive training activities were provided to a total of 1 007 SMS and 280 DAs on IPM principles, techniques and their implementation. The training activities helped experts to deliver extension services in a more effective and efficient manner, to improve the perception of smallholder farmers; and encouraged them to adopt and implement IPM practices in their fields, integrated with the overall crop production system.

Training was provided to 2 385 beneficiary farmers (instead of the original target of 920 farmers), who participated in IPM implementation through IPM-FFS. The intensive training activities enhanced the perception of farmers, and encouraged the adoption and implementation of recommended IPM technologies and practices. These were further refined on the basis of the local conditions and experience gained. Twenty specific crop-pest combinations were identified, prioritized and implemented, and the recommended IPM practices were used for eight crop pest combinations, with the active involvement of the beneficiary farmers, who were organized under IPM-FFS groups (see Appendix 3). A further 1 035 farmers showed interest in adopting IPM practices, based on the spillover effects of the IPM implementation in their neighbouring fields, and/or were encouraged by the results observed during the experience-sharing events organized for those receiving training and implementing IPM practices in their respective fields.

3.2.4 Organize exposure visits to experts and DAs

- *Select participants from target woredas*
- *Conduct visits in selected IPM-FFS (one per region and one at federal level)*

Exposure visits to best practice sites were conducted, to facilitate the interaction and learning process among IPM-FFS members and non-member farmers, to learn from their neighbours. A total of 852 experts participated.

Fig. 9. Faba bean and wheat fields managed by IPM-FFS groups, Yaya Gulelie (2015 production season)

3.2.5 Farmer exposure visits to IPM-FFS best practice sites

- *Select participants (50 per IPM-FFS)*
- *Conduct visit in selected IPM-FFS (one woreda per site)*

A total of 3 345 farmers (an increase in the original target of 195 experts and 2 300 farmers) participated in exposure visits. The national IPM Field Day, which was conducted in 2016 by FAO Representation in Ethiopia, in close collaboration with Oromiya Region, was celebrated jointly with the 2016 International Year of Pulses in Yaya Gulelie Woreda, North Shewa Zone, Oromiya Region. The event was attended by 1 828 participants, of which 1 703 were farmers, and the remaining 125 were experts, DAs and administrative staff drawn from federal level, the four project regions and project woredas.

Fig. 10. Regional experience sharing event in Yaya Gulelie, Oromiya (in 2015)

3.2.6 Provide technical support to target regions/woredas and MoANR

- *Technical backstopping at different levels of AGP areas (one every month)*
- *Proactively participate and contribute at pest management fora*

Sixteen technical backstopping support services were provided to project woredas at least once every quarter, which closely supported project implementation. During the field supervision missions, staff facilitated local level training sessions, provided technical advice to field staff on technical matters, and helped them resolve problems and implement project activities smoothly.

Acknowledgement and media coverage

Four regional days and one national field one were conducted in selected project woredas. The national field day took place in November 2016 in Yaya Gulelie Woreda in Oromiya Region. As mentioned above, the event was celebrated jointly with the 2016 International Year of Pulses. It was attended by 1 828 participants drawn from federal ministries, FAO Ethiopia Country Office, the four project regions and 14 project woredas, and DAs, including beneficiary farmers from Yaya Gulelie Woreda.

The Ethiopian Herald published an article on this event, which can be accessed at the following link: http://197.156.69.172/herald/index.php/technology/item/6704-implementing-integrated-pest-management.

D. PROJECT PERFORMANCE RATINGS

Table 1: Project performance ratings

		Rating	Justification for rating
A	Supervising entity (SE) self-assessed project ratings on "the achievement towards own PDO"	HS	The project was successfully implemented, in a manner that aligned well with the overall AGP-I project activities. The project reached its intended outputs, and most of the project targets were overachieved. The funds were fully disbursed and efficiently utilized for the intended project activities. The project mobilized two short-term experienced international consultants, as foreseen in the project design document, and developed two technical documents on forage development titled "Forage Production and Multiplication System for Ethiopia", and "Livestock Extension System in Ethiopia", and a third one on "IPM Implementation Strategy for Ethiopia". All three documents were developed on the basis of the gaps identified, and in close consultation with stakeholders. These technical materials were peer-reviewed and officially cleared, and distributed to implementing institutions to strengthen the formulation of policies and legal frameworks. The project also successfully utilized national project staff in the provision of technical backstopping services, developing Livestock Ration Formulation and Feeding Guidelines, and the National IPM Guidelines for experts in project regions and woredas, which are key documents. The project performance rating (by the Technical Lead Officer with FAO headquarters) was therefore highly satisfactory. The project enhanced the capacities of implementing institutions for effective and efficient delivery of extension services focused on smallholder subsistence agriculture, which will increase production and productivity and, in turn, income. The project successfully promoted both improved forage technologies and IPM practices, which are well integrated into the crop-livestock production systems. The project development objectives achieved and realized the expected outcomes of the project to a large extent.
B	SE self-assessed project ratings towards the Technical Assistance (TA) project's contribution to the "achievement of the PDO of the associated investment project"	S	The project was successfully implemented, in a well-coordinated and integrated manner with the overall AGP-I project activities, using existing government structures at all levels. It established and actively participated in a JRIS and Evaluation Framework, enabling FAO to take corrective measures in a timely fashion. Most of the project targets were overachieved, in particular capacity-building and training activities, which supported all 96 AGP supported woredas to facilitate the uptake of improved technologies and practices, both in forage development and the IPM programme. The funds were fully disbursed and efficiently utilized for the intended project activities.

C	SE self-assessed project ratings towards "tangible outcomes arising from collaboration with associated investment project"	S	The key milestones outcomes of the project were: • enhanced organizational and human capacities of implementing institutions at all levels to adopt and implement improved forage development and IPM technologies and practices, integrated with both crop and livestock production systems and sustainable natural resources management; • the provision of needs-based training courses to 1 001 and 1 287 SMS and experts, including DAs, 6 256 and 3 420 smallholder farmers for forage development and IPM programme respectively; • the development of technical materials, which proved to be instrumental to influencing the policy dimension of the government, such as the three technical reports produced by the short-term international consultants mentioned above and the "Pest Management Support Services Strategy for Ethiopia", which were supported and developed in close consultation with MoANR; and • the three training manuals developed with the project support: Forage Production, Livestock Ration Formulation and Feeding Guidelines, and the National IPM Guidelines for experts. These were published (1 000 copies each) and distributed to MoANR, MoLF, and other key stakeholders. They are intended for field practitioners, from federal to project woreda levels, including DAs, to deliver effective and efficient extension service to smallholder farmers, higher learning institutions and ATVET colleges, in order to train future DAs, crop and livestock private producers, private forage and crop seed enterprises, associations and other key stakeholders.

Key: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U)

Table 2: Contribution to cross-cutting themes

	Contribution (-,*, **, ***)	Brief explanation
Climate-smart agriculture	***	Initially, Climate-smart agriculture was not thoroughly incorporated in the design document. However, the project activities contributed to reducing the negative impacts of climate change by implementing climate-smart agricultural practices, such as the integration of forage development with crop production and natural resource management, which contributed to improved soil fertility and the rehabilitation of degraded lands. In this respect, both forage development and IPM components contributed to enhanced agricultural production and productivity. For example, leguminous forage species, in addition to improving forage quality and availability, also contributed to enhancing soil fertility, soil and water conservation measures, reducing soil erosion and enhanced rainwater infiltration into the soil, and thereby increased soil water holding capacity. In addition, IPM implementation contributed to reduced crop pest damage and pesticide use, and thus minimized the risks of pesticide use on people's health, animals and the environment. Forage seed production through irrigation is reducing the negative impact of climate change.
Nutrition	**	• Improved quality and quantity of forage availability can contribute to increasing livestock productivity. This, in turn, will contribute to improving dietary habits and intake of households from livestock products. • Crop diversification and productivity enhancement can also contribute to improving dietary habits of rural households, and to ensuring nutrition security for them.
Gender	**	• The project was designed to benefit smallholder farmers, with a particular emphasis to equally benefiting women and youth. Approximately 20 percent of the beneficiaries were women. • Women were involved in training sessions and various development interventions, such as backyard forage development, and nursery management for forage seed production and seedling multiplication.
Job Creation	**	• The project supported forage nursery establishment and management, which involved jobless youth and elders in nursery management activities, producing an estimated 10 679 665 seedlings of various forage tree species, such as tree lucerne, sesbania,

	Contribution (-,*, **, ***)	Brief explanation
		pigeon pea, elephant grass, vetiver grass. • Forage seeds and seedlings can be sold, and serve as a source of income for smallholders. • Women and youth are encouraged to produce forage seeds and seedlings as a business venture. • Increased productivity through better animal nutrition boosts the quantity of products processed, and creates job and added value in microprocessing.

Key: **-** = none planned; ***** = planned but did not achieve planned contribution, ****** = planned contribution achieved, and ******* = exceeded planned expectations

E. PROJECT IMPACT

Aspects of the impact of the project are outlined below, categorized under the two main components of the project, namely forage development and the IPM programme.

Forage development

Improved capacity and skills in place

Needs-based intensive training was provided to professionals at all levels, which helped them develop practical skills, and thus improved forage development extension service delivery to smallholder farmers in the pilot and other AGP woredas. Local level tailor-made training activities cascaded down effectively to farmers, and this enhanced the adoption and implementation of improved forage technologies and innovative practices integrated with their farming systems. The capacity built will greatly enhance the development and utilization of forage resources and livestock production, and thus will improve livelihoods.

Forage seed production and multiplication systems promoted and being pursued

Forage activities were effectively demonstrated in selected FTCs, CIGs and individual farmers' plots by growing improved forage crops, and introducing and promoting forage seed and multiplication systems. At local level, demonstration activities were technically supported by DAs, in integration with their regular promotion of improved agricultural technologies and practices. It was practically demonstrated that forage seed production can be effectively handled by smallholder farmers with regular technical support through DAs, even in woredas where landholding is very small, and farmers are intensive crop-livestock producers. Forage species were adopted and helped the smallholders, which is a best practice that can be scaled up (Fig. 9).

Further forage planting material (seed, seedlings, etc.) were multiplied for planting in selected watersheds, where they were utilized through a cut and carry system, as demonstrated

in the selected watersheds. The demonstration activities were instrumental, and helped farmers to familiarize themselves with the various forage development strategies and practices, and were implemented by integrating them into their farming systems.

Figure 9. Growing of improved forage grass species at Aruma in backyard during 2015, Wondo Genet, SNNPR

Forage planting material availability increased

This helped to ensure the continuity and sustainability of the forage production activities beyond the project period. A series of field days were organized around forage demonstration activities, and experiences were shared. Non-targeted farmers were also convinced of the benefits, and picked up some of the strategies and practised them in their plots. Through project support, enhanced knowledge of smallholder farmers regarding forage production encouraged them to grow improved forage, such as a mixture of oats and vetch. This was demonstrated effectively in one of the pilot project woredas, Basona Werana, located in North Shewa Zone of Amhara region, which covers more than 20 ha, utilizing a cluster approach, where interested farmers with adjacent plots were involved. This facilitated adoption and can be considered as a good practice to be drawn on in the future.

The forage that was produced enhanced the availability of good quality feed, which serves as supplementary feed to improve the productivity of animals. The mixture of oats and vetch crops contributes to improved quality and quantity of feed, integrated in most cases with dairy farming and fattening of beef cattle in Basona Werana Woreda, where it has been reported that milk productivity has increased. Furthermore, potential forage species for suitable agro-ecologies were effectively demonstrated through project support. Among the forage grass species promoted were high protein rich *Stylosanthes guianensis* or high biomass yielding Mulato II grass, desho grass, napier grass/elephant grass, phalaris, rhodes grass and oats. Forage legumes successfully introduced and promoted included: vetch, cowpea, lablab, pigeon pea, alfalfa, leucaena leucocephala, sesbania and tree lucerne.

Improved utilization of available feed resources

Farmers supplemented their animals' feed by using a combination of improved forage crops, especially leguminous species, and poor quality crop residues, hence improving the quality, availability and intake of major poor quality feed resources locally available. However, farmers still lack awareness and skills regarding the different methods of improving livestock feed and utilization efficiency using the available feed resources. This should be given emphasis in the future, to introduce more appropriate methods for improving feed utilization efficiencies, to contribute to increased livestock productivity. The livestock ration formulation and feeding guidelines manual developed during the project provides the necessary support to build capacity in improving feeding and feed utilization efficiency.

Self-sufficiency in planting material production

As a result of the increased amount of forage seeds through intensive seed production and multiplication, some of the pilot woredas reported that they were now self-sufficient in forage planting materials for some forage species, and in some cases they were re-serving them as seed sources to neighbouring woredas. They are also selling seeds to Non-governmental Organizations (NGOs), to be distributed to farmers within and/or outside the pilot woredas. This has improved forage seed availability at local level.

Contract seed production arrangement with the private sector established

An improved forage seed production scheme under a contractual arrangement was initiated and implemented with a private forage seed company, which was linked up through the project, in collaboration with AGP PMU, at local level. A contractual agreement was signed between Eden Field Agri-Seed Enterprise and smallholder farmers who were interested in engaging in forage seed production, which involved producing and selling high quality forage seeds. Eden Field Agri-Seed Enterprise agreed to purchase the seed produced for a price that was agreed on for specific forage crops. The price received for growing and selling forage crops was reported to be higher than that received for growing other food crops. This was initiated and implemented in one of the project woredas, Efratana Gidim, during the dry season in 2016, on land under irrigation. Based on the experience gained, forage seed production was further scaled up within the same woreda, and taken up in three others, neighbouring Kewet Woreda in North Shewa Zone, Amhara region, and the other two in Oromiya Region, namely Limu Bilbilo and Degelu Tijo. This was considered a good practice that actively involved smallholder farmers in running seed production as a business, to create market access and enhance sustainable production of quality seed production.

Developed training manuals to be used beyond the project period

As mentioned above, the needs assessment that was carried out informed the production of manuals serving as training and reference materials in the areas of forage production and livestock feeding, as well as providing source materials for more simplified training support. The manuals are mainly intended for field practitioners, including DAs, to guide them in effective and efficient extension service delivery; but can also be used and referred to by small-scale commercial producers. Fact sheets on major improved forage species, highlighting basic characteristics, environmental requirements, limitations and suitable agro-ecologies for production, harvesting procedures to be followed and their proper utilization, were also prepared and distributed to users for future reference.

Policy support

The project positively influenced and contributed to strengthening and supporting the Government in its efforts in policy and strategy development. As mentioned above, the project supported the development of two policy documents to guide policy and strategy formulation, which were developed on the basis of consultations and identified gaps, with the support of an experienced short-term international consultant.

Integration of forage into watersheds/Natural Resources Management structures

Forage tree species were integrated with watershed development programmes in 25 selected watersheds; and seedlings of various forage tree species were planted on a total of 585.6 ha of watershed areas. These areas serve as sources of forage seed for further multiplication, in addition to feed production and natural resources conservation benefits. Furthermore, integration of multipurpose tree legumes into the watersheds brought additional benefits to farmers, such as a supply of fuelwood, which can substitute cow dung fuel, and can be returned to the soil to improve soil productivity. Thus, integration of forage into the natural resources conservation strategy is essential for improved ecosystem services and sustainable natural resources management, and will thereby improve livestock production and productivity.

Exposure visits and peer learning as good extension tools in forage development

Exposure visits and peer learning brought about attitudinal changes and improved the knowledge of smallholder farmers, thereby increasing the adoption and implementation of forage development activities in their lands. However, it was observed that follow-up support was required to strengthen forage production and management, to identify appropriate

methods to increase available forage resources and forage utilization efficiency, which will increase productivity and reduce the impact of greenhouse gases.

Integration of forage into cropping systems

Vetch was effectively integrated into the cropping system of Basona Werana Woreda, which suffered from poor soil fertility, by breaking the traditional practice of skipping a planting season to enhance productivity from a plot of land. Planting vetch during the season that is normally skipped has resulted in benefits from added forage and/or forage seed production, and enhanced fertility of the land, owing to nitrogen fixation. This has now become a practice in many parts of this woreda, which can be scaled up to similar areas.

Farmer-to-farmer exchange scheme

The mechanism of fostering a farmer-to-farmer exchange scheme of forage planting material at local level has been shown to enhance the expansion of forage development, with little follow-up required.

Use of vegetative planting material

The main focus in forage development was almost exclusively hinged on the use of seeds. The use of vegetative planting material, especially in the farmer-to-farmer planting material exchange scheme at local level, was favourably promoted. This proved to be a very viable approach.

Shift from annuals to perennials

Focus was shifted from planting annuals to perennial forage species, wherever appropriate. The focus on earlier forage development had been on annual species.

New forage species introduced and tested

Forage development efforts focused on a very limited type of forage species. New species were introduced to selected sites and tested for adaptability, to increase the diversity of species. Some of the introductions showed good results.

IPM programme

Developed IPM implementation strategy

As mentioned above, the national IPM implementation strategy that was developed during the project guided efforts to effectively adopt and successfully promote IPM

implementation. In addition, identified major crop-pest combinations and effective IPM practices, with the active involvement of smallholder farmers, were further refined, and included in the IPM packages that were promoted.

Integrated IPM in Pest Management Support Service Strategy for Ethiopia

Integration of IPM into the government policies and strategies of sustainable crop production systems is essential for the effective adoption and promotion of the IPM programme. To this end, the project supported the development of the Pest Management Support Services Strategy for Ethiopia, where IPM was incorporated. This was considered a key milestone for the project, as it successfully influenced government policy on crop pest management. It also enhanced institutional capacities to reform and strengthen the policy environment, to effectively support pest management services.

Developed National IPM Guidelines

On the basis of the experience gained and best practices identified, the project developed National IPM Guidelines for selected crop-pest combinations, which will be used as a practical guide to further promote effective IPM practices, and scale up to a wider geographic scale, to reach more farming communities. The guidelines could be further refined, based on field experiences to be gained and research findings.

Capacity at different levels built

Capacity-building support enhanced the ability of field practitioners at all levels, including DAs, to acquire basic IPM knowledge, and developed practical skills to deliver more effective and efficient extension services to smallholder farmers, to effectively adopt and promote IPM practices, integrated with an improved crop production system, which contributed to reducing crop pests and increasing crop yields.

Capacitated farmers under FFS are instrumental for IPM promotion

Interested farmers who were involved in IPM-FFS groups were capable of identifying IPM practices in their localities, and used them effectively, in an integrated manner with their farming systems. They also monitored the effectiveness and failures of suggested pest management options, and gradually developed their skills to design and implement corrective measures to improve the effectiveness of the recommended pest management practices.

Reduced pesticide use and thus risks to people and the environment

The goal of IPM adoption and implementation is to reduce the risks associated with pesticide, including threats to human health and the environment. Although measuring pesticide use in smallholder agriculture in countries like Ethiopia can be challenging, owing to the difficulties involved in obtaining accurate data, in the IPM-FFS groups the use of pesticides was least emphasized, as the focus was on carrying out routine monitoring twice a week, and removing early infestations/infections.

For example, in Bale highlands, both stem and yellow rusts affected significant wheat areas in 2014 and 2015, and fungicides were used in significant amounts with emergency support received from the Government. However, the four IPM-FFS groups that were organized and worked on wheat did not use any fungicide, because they routinely monitored their crop fields, and succeeded in preventing disease development. Similarly, in six wheat growing woredas in North Shewa, Oromiya, pesticides were sprayed in 2015 and 2016 to control yellow rust on bread wheat in all of them, apart from in the IPM-FFS fields in Yaya Gulelie. This was a result of the intensive training provided on IPM practices, including the use of pesticide as a last option, which enhanced the capacity of woreda experts, DAs and the beneficiary farmers to identify pests, carry out routine pest monitoring, and take informed decisions, based on the collected data during the biweekly agroecosystem analyses. Thus, the IPM-FFS groups avoided the use of pesticides, and reduced pesticide-related risks to human health and the environment.

Reduced production costs and increased crop yields

Based on the experience of IPM practices gained from rainfed crops, smallholder farmers were also interested in and encouraged to practice IPM on high-value irrigated crops during irrigation seasons. This helped farmers to reduce the use of pesticides significantly, as well as to increase their incomes and diversify crop production, and improve their dietary habits. As a result of the adoption and implementation of IPM practices by smallholder farmers, pest control costs were reduced, yield losses decreased, and incomes increased. The reduced use of pesticides also helped lower the mortality rate of beneficial insects, such as bees, predators, parasitoids, and other pollinators.

F. IMPLEMENTATION OF WORK PLAN AND BUDGET

Work plan and budget

As mentioned above (Section B), the direct project beneficiaries were smallholder farmers who were actively engaged in crop-livestock production systems in pilot AGP-supported woredas. Initially, it was planned to reach a total number of 20 000 households, which is equivalent to 100 000 individuals. This figure was successfully achieved, and approximately 20 percent of the total population were women. The table below outlines the details of proposed direct beneficiaries, and actual beneficiaries.

Table 3: Number of actual direct beneficiaries

Disaggregated by Gender	Proposed direct beneficiaries	Actual direct beneficiaries
Total Beneficiaries	100 000	114 229
20% women	20 000	21 704

Resource partner contribution

The budget of USD 1 500 000 was provided by GAFSP. A no-cost extension was implemented in order to complete TA activities. The WB Ethiopia Country Office managed the USD 50 million GAFSP fund allocated for the investment cost funded to AGP-I, Ethiopia.

G. SUSTAINABILITY

a. Capacity development

Needs-based intensive training activities were provided to professionals of implementing institutions at all levels, including frontline DAs, which improved capacity, and thereby extension service delivery, in forage development and the promotion of IPM. These were demonstrated in effectively organized local level training activities, and by mobilizing communities actively involved in the two activities. These efforts laid the foundation for project beneficiaries to continue delivering training activities on their own, after the project phased out, using funds from AGP-II or other sources, and to sustain project-based initiatives beyond the project period.

In addition, institutional capacity was built through technical assistance, the training manuals developed and technical materials supported by the project, which will be used in the future to effectively organize and conduct local level training activities within the old and new AGP-supported woredas. Support was also provided for policy-related aspects, and for the

development of strategies in both forage development and the IPM programme, including a forage seed production and multiplication system, a livestock extension system, an IPM implementation strategy and Pest Management Support Service Strategy.

During the project, beneficiary farmers who were engaged in forage development and the implementation of IPM programmes received intensive training in the respective disciplines. The training activities increased farmers' awareness, enhanced their knowledge, and developed their practical skills. These will enable farmers to effectively adopt and implement improved technologies and practices of forage development and the IPM programme, and thoroughly integrate them in their farming systems, taking into consideration location specific situations, to ensure project sustainability.

Other project activities, such as AGP-I supported ones, were effectively aligned and implemented using the existing government structures at all levels. The institutional and technical capacities that were built through the intensive training courses will be used to continue project-based initiatives, by integrating them with regular annual plans. DAs assigned to FTCs, who were involved in project implementation, acquired the required capacity, which will ensure the continuation of technical support to beneficiary farmers.

b. Gender equality

During the project, adequate emphasis was given to actively and fairly involved women and youth. Approximately 20 percent of the total beneficiary households were female-headed. Efforts were made to involve women and youth in all project activities and training sessions. Despite these efforts, the participation of women remained below that of men. For example, the involvement of women in IPM implementation was limited because of the nature of the work. However, they were actively involved in backyard forage and nursery management activities.

c. Environmental sustainability

The improved technologies and practices promoted through the project, both under livestock/forage development and the IPM components, were environmentally friendly and contributed to reducing the impacts on the environment. In particular, forage development, integrated with the watershed development programme and crop production system, contributed to increasing the sustainability and productivity of soils. The increased forage biomass also contributed to soil and water conservation measures, and thereby reduced soil erosion and enhanced the infiltration of rainwater into the soil, thus enriching soil water holding capacity.

The forage species that were introduced into the watersheds contributed to increasing the availability of forage for honey bee foraging, or collecting nectars and pollen grains, helping to boost honey production. In addition, the increased biomass will potentially enhance carbon sequestration, and reduce the impact of greenhouse gas emissions. The integration of multipurpose tree legumes into the watersheds brought additional benefits to farmers, such as the supply of fuelwood, which can substitute cow dung fuel. Thus, integration of forages into the natural resources conservation strategy is essential for improved ecosystem services and sustainable natural resource management.

Similarly, IPM practices are focused on non-chemical control options. Pesticides are used as a last resort, and are implemented through integration with improved crop production systems. This has contributed to reducing the risks posed by pesticide use to people and the environment. In addition, reduced pesticide use means that farmers save money, as a result of purchasing fewer pesticides.

d. Technological sustainability

The project introduced and promoted improved forage crops, which were effectively demonstrated in selected FTCs, CIG plots and individual farmers' fields. The seeds and seedlings produced and multiplied in selected FTCs were suitable, and well adapted to the different agro-ecologies. Therefore, the seeds or planting materials will be used as a source to be distributed to smallholder farmers who do not have the required quality or quantity of improved forage crops seeds. In addition, the forage species integrated with the selected watershed activities can also be used as seed sources to be harvested and distributed to farmers interested in improved forage development activities.

The integration of forage development activities with watershed development was successfully established, and used as a feed supply through a cut and carry system. Similarly, IPM practices that were identified and implemented through integration with improved crop production, location specific situations, and actively involving smallholder farmers, showed promising results. However, on the basis of the field experience gained, it emerged that new research findings technologies could be further refined.

e. Economic sustainability

The specialized forage seed production schemes that were initiated, both under irrigation and rainfed conditions, could be used to establish seed production as a business, and to sell quality forage seeds to the surrounding farmers. The financial incentive introduced through the forage seeds production scheme on a contractual basis will encourage farmers to

continue forage seed production activities on a commercial scale. This would also sustain the forage seed supply as an integral part of forage development, and integrated with improved livestock feeding systems.

The introduction of leguminous tree species such as pigeon pea, tree lucerne, sesbania and leucaena, in combination with grass species integrated with watershed development activities, provided an opportunity for the production of a supplementary feed supply for livestock feeding during the dry season. This will also contribute towards ensuring year-round forage availability, and sustain the seed system. Improved quality and quantity of forage availability will increase livestock production and productivity, and thus increase the income of smallholder farmers.

H. LESSONS LEARNED

Table 4: Lessons learned and recommendations for future operations

	Lessons learned	Recommendations
Project Design (including process and participation)	There was strong commitment to project implementation throughout its cycle. However, it was observed that implementation capacity was still limited, frequent staff turnover was common, and suitable handover procedures were lacking.	Strengthen commitment, and effectively align project design and implementation to the priority areas of the long-term development programme. It is also advised that monitoring and follow-up be ensured, and that corrective actions be taken to increase impacts in a timely fashion.
	Suitable project design with clear measureable indicators is essential to guide the project, assess progress, and make necessary modifications.	During the project design a clear project monitoring and evaluation system should be developed, which includes precise and agreed upon indicators. This leads to better monitoring of project implementation, improved performance evaluation, and effective documentation of project impacts.
	Both technical and institutional capacity building is instrumental for putting in place more effective and efficient systems, and developing the skills of human resources. It is therefore necessary that sufficient financial resources be allocated to properly identify needs, and design and implement policies, strategies and programmes/projects.	It is recommended that both institutional and technical capacities be further strengthened, in order to enhance organizational capacity to put in place more effective and efficient systems, and develop skills of human resources, by allocating adequate financial resources to properly identify needs, and to design and implement policies, strategies and programmes/projects for improved impacts.
	The project was implemented using the existing government structures at all levels, and technologies were prioritized, in consultation with	During project design it is important to ensure the alignment of project activities with long-term development priorities of the Government, using the existing

	Lessons learned	Recommendations
	beneficiary farmers. The capacity of woreda level experts was built, which assisted the start of AGP-II implementation, which contributed to ensuring sustainability.	structures at all levels, in order to build capacity, improve implementation, closely monitor and evaluate the impacts of the project, and ensure sustainability.
Project Implementation (including institutional arrangement)	Crop-livestock integration was practically demonstrated by growing improved leguminous forage crops, either intercropped and/or planted in contour strips, or as hedgerows. This contributed to soil fertility enhancement, as well as to increasing forage availability for livestock feeding; and the quality of crop residues was improved by mixing with vetch grown in a mixture, or using other forage strategies.	Enhance crop-livestock integration with adequate emphasis on sustainable natural resources management. Integration will contribute and supplement each other, enhance the ecosystem service, and maximize the benefits to smallholder farmers from both crop and livestock enterprises. Therefore, it is important to properly document and scale up best practices learned during project implementation.
Collaboration (including with government counterparts, SE of associated investment project, civil society organizations)	The coordination platform of RED&FS Sector Working Group (SWG) and JRIS mechanism actively involving the Government and Development Partners (DPs) played a significant role; and assisted in informing and sharing project progress, and taking timely corrective measures to improve project implementation.	Strengthen the role of the existing coordination platform of RED&FS SWG and JRIS mechanism, as tools to harmonize approaches and procedures among initiatives, monitor project implementation, assess project progress, identify constraints and challenges to take corrective actions to improve project implementation, in order to realize objectives.
	The introduction and promotion of improved forage seed production under irrigation is a good practice to overcome feed shortages, and improve the feed supply, in terms of quality and quantity year round, and integrated with priority livestock production systems, such as fattening, dairy and draught animals.	Strengthen promotion of improved forage production under irrigation, in order to supply adequate quality and quantity of forage availability year round, and integrate with strategic livestock feeding system, giving priority to fattening and dairy animals to increase production and productivity.
…	The involvement and integration of research was minimal during project implementation in both forage development and IPM components. This resulted in limited availability of improved technologies and practices to be taken up and implemented.	Research support is strongly advised in order to test and assess the appropriateness of the technology for different agro-ecologies, and integrate with farming systems, to increase the adoption and implementation of improved technologies and practices to wider geographic areas, to reach and benefit more farmers.
	Integration of forage development into selected watersheds showed good results in increasing feeds availability for livestock, reducing soil erosion and enhancing rainwater infiltration into the soil, and improving water holding capacity.	Strengthen integration of improved forage species to suit different agro-ecologies, and adapt to the local farming system, to increase biomass and reduce soil erosion, and increase forage availability to livestock, using a cut and carry system, integrated with strategic livestock feeding systems.

	Lessons learned	Recommendations
	Open grazing is a major constraint for improved forage production. This was taken into account by putting in place a policy framework aligned with existing guidelines in some regions, to support zero grazing and/or control grazing system.	Policy initiatives and legal frameworks should be further strengthened and enforced, in order to effectively support the promotion of zero and/or control grazing. It is recommended that these be implemented with the active participation of smallholder farmers.
	Conducting baseline studies on both forage development and IPM during the early period of project implementation is essential for setting the baseline information, against which subsequent changes using performance indicators can be measured and evaluated.	It is important to conduct and establish baseline information of the project with clearly defined indicators. This can be used to guide and monitor project implementation, assess progress and evaluate project impacts against the established baseline data.
	If properly trained and organized into FFS, and appropriately guided and facilitated, smallholder farmers are both receptive and responsive to interventions, such as promoting IPM.	Continual capacity-building support and facilitation are crucial to increasing awareness, familiarizing smallholder farmers, and encouraging them to be actively engaged in IPM implementation in a more organized and coordinated manner, through organized IPM-FFS groups.
	IPM implementation should be guided and supported by simplified but standard pest management guidelines and a forage development practical guide, which is tailored for ease of use by woreda level experts, DAs and farmers, in order to effectively support forage development and IPM implementation.	In order to support the promotion and scaling-up of the IPM approach, it is highly recommended that a simplified pest management field guide be provided, which is tailored for ease of use by woreda level experts, DAs and farmers. It is advised that these be produced in local languages, considering economic crops and their respective key pests.
	Coordination and networking for both forage development and promotion of the IPM programme was not sufficient to facilitate experience sharing and enhance synergy among various initiatives working on forage and IPM technology development and implementation.	Promotion of the IPM programme requires more coordinated and effective networking, with active involvement of key stakeholders - both public and private - to facilitate experience sharing and enhance synergy among various initiatives working on forage and IPM technology development and implementation.
Any GAFSP specific matters	GAFSP strategic areas of support were found to be key to ensuring food and nutrition security, and benefiting resource-poor households, especially women and youth.	Strengthening support, integrated with country-led long-term development programmes, and putting in place strong M&E systems to assess progress and evaluate impacts, with the active participation of beneficiary farmers, will lead to maximum impact.

Obstacles and challenges

- *Weak technical support by the respective regions to project woredas.*

  Regional focal persons were periodically advised to further strengthen the technical support provided to the pilot woredas. This was improved gradually in Oromiya, Amhara and SNNPR.

- *Staff turnover and insufficient handover procedures for newly assigned focal persons created some gaps in the close follow-up of project activities.*

  Frequent staff turnover is a common feature within project teams. Thus, it was suggested to actively involve other experts in project implementation, in order to share the workload. In addition, agreed-on handover procedures were followed. This included handing over project documents to the substitutes, as well as providing briefings on project objectives, implementation arrangements and progress to date.

- *Delayed action in delivering quality performance reports from project woredas.*

  This was discussed with the respective regions and project woredas, and was subsequently improved. However, limited progress was made, and issues persisted in some project woredas, owing to frequent staff turnover.

I. FOLLOW-UP ACTIONS

Following the successful implementation of the GAFSP-supported AGP, including the FAO TS component, and given that further support was required for smallholder agriculture, the Second Agricultural Growth Programme (AGP-II) was designed, in order to increase agricultural productivity and the commercialization of smallholder farmers. Implementation of the programme began in October 2015 in 157 targeted agricultural potential woredas, including 61 new woredas, in addition to the 96 woredas supported during AGP-I.

AGP-II was designed to target a total of 1.6 million smallholder farmers, of which 40 percent are female-headed households. It aims to reach more smallholder farmers from a wider geographical area; enhance agricultural production and productivity through research-supported technologies and efficient irrigation water management; establish effective linkage with the market; and accelerate agricultural transformation by mainstreaming cross-cutting issues, such as climate-smart and nutrition-sensitive agriculture and gender, in all AGP-II components. AGP-II is one of the main pillars of the flagship programmes supporting the implementation of the second Growth and Transformation Plan (GTP-II) of the Government.

This will ensure the continuation of the implementation of the best practices gained during AGP-I, and maximize the cumulative impacts of AGP-II, to contribute to the overall agricultural growth of the country. Therefore, through the fourth call for proposals through the GAFSP public sector window, the Government submitted a proposal for USD 55.3 million for financing the gap to AGP-II, of which USD 52.3 million was estimated for investment costs to be administered by WB. FAO applied for USD 3 million from this fund, to continue to strengthen the technical support aligned with AGP-II, by scaling up best practices in the areas of forage development and IPM, and promoting climate-smart and nutrition-sensitive agriculture and gender, through capacity building support, to ensure effectively mainstreamed cross-cutting issues into all the AGP-II components.

J. GOVERNMENT ATTENTION

It is urged that GAFSP continue to provide support to key strategic areas of interventions for maximum impact, which are well aligned with beneficiary countries' needs, and strongly aligned with parallel initiatives, to ensure synergy and maximize cumulative impacts, for increased benefits to smallholder farmers.

Appendix 1

PROJECT IMPLEMENTATION PROGRESS AGAINST TARGETS OF THE PROJECT RESULT FRAMEWORK

Intervention Logic	Verifiable Indicators	Project target	Accomplishments		Means of Verification
			Project Total	% of the total target	
Impact					
More effective, inclusive and country-owned livestock development and IPM programme through strengthened national capacities	Improved delivery capacity of MoANR/MoLF at regional and woreda levels				TS-AGP project monitoring and progress reports
Immediate objective 1					
Improved human and organizational capacities to incorporate sustainable, intensified livestock production into integrated watershed development, in particular by male and female smallholder farmers	# of institutions capacitated			MoANR and MoLF at all levels	TS-AGP project monitoring and progress reports
Output 1					
Enhanced organizational and human technical capacities in sustainable, intensified livestock production enhanced at federal, regional and woreda levels	% of trained government staff reporting that they are applying new learning/experience/ skills in livestock feed production and management				Self-assessment, follow-up questionnaire 4-6 months after the completion of capacity development
	Availability of guidelines and training manuals on integrated animal nutrition and forage production			Two training manuals produced: Forage Production and Ration Formulation and Feeding Guidelines	TS-AGP project monitoring and progress reports
	# of government-led farmer training programmes			Trained 6 256 farmers	TS-AGP project monitoring and progress reports
	% of trained farmers (male and female) and applying new learning/experience/skills in livestock feed production and management			1 251	Self-assessment, follow-up questionnaire 4-6 months after the completion of capacity development

Intervention Logic	Verifiable Indicators	Project target	Accomplishments		Means of Verification
			Project Total	% of the total target	
1. Cross-cutting activities					
1.1 Ensure alignment/planning/M&E					
1.1.1 Consultations with AGP-PMU, Livestock and PHR directorates, regions and other stakeholders	# of consultations made with AGP-PMU and regions	16	16	100	TS-AGP project monitoring and progress reports
1.1.2 Align annual work plans with AGP	# of annual work plans and budget aligned with AGP-I	4	4	100	"
1.1.3 Visit activity sites, consult and provide technical backstopping to regions/woredas for co-planning/M&E	# of field trips conducted and back-to-office reports produced	16	16	100	"
1.1.4 Regular reports (monthly, quarterly, semi-annual, annual and completion)	# of periodical reports produced and communicated to MoANR and funding organization	29	31	106.90	"
1.1.5 Monitor and collect feedback from implementing partners (through monthly communication)	# of monitoring reports produced and communicated to stakeholders for feedback	48	52	108.33	TS-AGP project monitoring and progress reports
2. Component 1: Livestock (activities)					
2.1 Livestock feed development					
2.1.1 Forage seed multiplication and demonstration sites established in selected FTCs	# of selected FTCs where forage demonstration activities established		52		"
Provide training to farmers on forage feed production and management	# of farmers trained on forage feed production and management	1 100	6 256	568.73	"
Provide technical support and backstopping to regions, woredas and project sites (one visit/quarter)	# of technical backstopping and # of back-to-office reports produced	16	16	100.	"
2.1.2 Integration of forage development activities into watershed development in selected watersheds	# of watersheds where forage development integrated	12	25	208.3	"
2.1.3 Provide training to SMS and DAs in the area of livestock feed production and management.	# of SMS/DAs trained on forage feed production and management	166*	1 001	603.01	"
2.1.4 Conduct exposure visits for SMS and DAs	# of experience sharing visits conducted to SMS and DAs	208	462	222.12	"
2.1.5 Farmer exposure visits	# of experience sharing visits conducted to farmers	8 000	4 764	60.3	"
2.1.6 Prepare animal nutrition and forage production training manuals/guidelines					"

Intervention Logic	Verifiable Indicators	Project target	Accomplishments		Means of Verification
			Project Total	% of the total target	
Prepare training manuals/guidelines on forage production, ration formulation and feeding guidelines	# copies of training manuals/guidelines prepared	2	2	100	"
Training manuals/guidelines printed and distributed to MoANR/MoLF and other stakeholders for use (Printed and distributed 1 000 copies each)	# of training manuals/guidelines printed and distributed to MoANR/MoLF and other key stakeholders	2 000	2 000	100	"
Factsheets on forage species prepared in local language	# of fact sheets prepared	0	10		"
2.2 Livestock policy					
2.2.1 Prepare forage production and multiplication systems and livestock extension for Ethiopia					
Conduct review and field assessment, and hold consultation with stakeholders; and develop forage production strategy to support and guide forage development efforts in Ethiopia	# of final technical reports produced	1	1	100	Short-term International Consultant Report
Develop livestock extension system for Ethiopia, get clearance from FAO headquarters and distribute to MoANR/MoLF, and other key stakeholders	# of Livestock Extension System developed and shared with MoANR/MoLF, and other key stakeholders for use	1	1	100	Short-term International Consultant Report
Immediate objective 2					
Increased adoption of IPM approaches in Ethiopian crop production	# of public and private institutions adopting recommended IPM practices				
Output 2					
Enhanced organizational and human capacity of MoANR/MoLF to plan and implement IPM programme	% of trained MoA staff reporting that they are applying new learning/experience/skills in IPM				
3. Component 2: IPM (activities)					
3.1 Prepare basic IPM implementation-related documents					
Develop IPM implementation strategy/roadmap (International Consultant)	# of IPM strategy/roadmap developed	1	1	100	Short-term International Consultant Report
3.2 Conduct capacity-building activities					
3.2.1 Prepare training materials					
Develop/prepare national IPM training	# of training manuals/guidelines	3	2	66.7	TS-AGP project

Intervention Logic	Verifiable Indicators	Project target	Accomplishments		Means of Verification
			Project Total	% of the total target	
manuals/guidelines for experts, DAs and farmers	prepared				monitoring and progress reports
Training manuals/guidelines printed and distributed to implementing institutions and other stakeholders	Copies of training manuals printed and distributed to IAs and other SHs				
3.2.2 Strengthen and/or establish farmers groups on IPM-FFS in the fourteen target woredas (3/woreda - 46)					
Establish IPM-FFS on identified crop-pest combinations	# of IPM-FFS groups established and operational	46	72	156.5	TS-AGP project monitoring and progress reports
3.2.3 Provide training to experts, DAs and farmers					
Conduct training on IPM principles, techniques, and their implementation for experts	# of experts trained on IPM principles and techniques	174	1 007	578.74	TS-AGP project monitoring and progress reports
Training on IPM implementation facilitation for DAs	# of DAs received training on IPM principles and techniques	42	280	666.8	TS-AGP project monitoring and progress reports
Provide training to members of IPM-FFS (20 members per IPM-FFS)	# of farmers/IPM-FFS/ trained on IPM principles and techniques	920	3 420	371.74	TS-AGP project monitoring and progress reports
3.2.4 Organize exposure visits to experts and DAs					
Select participants from target woredas and conduct experience sharing visits to experts/DAs	# of participants (experts/DAs) attended experience sharing events	195	852	436.9	TS-AGP project monitoring and progress reports
Conduct visit in selected IPM-FFS (one per region and one at federal level)	# of experience sharing events organized and conducted at federal and regional levels	10	10	100	TS-AGP project monitoring and progress reports
3.2.5 Organize and conduct farmer exposure visits to IPM-FFS best practice sites					
Select participants (50 per IPM-FFS)	# of IPM-FFS members and non-members attended exposure visits	2 300	3 345	145.44	TS-AGP project monitoring and progress reports
Conduct visit in selected IPM-FFS (one per woreda site)	# of experience sharing events conducted at woreda level	21	21	100	TS-AGP project monitoring and progress reports

Intervention Logic	Verifiable Indicators	Project target	Accomplishments		Means of Verification
			Project Total	% of the total target	
3.2.6 Provide technical backstopping/ support to target regions/woredas and MoANR					
Quarterly technical backstopping mission to project areas	# of technical backstopping and # back-to-office reports produced	16	16	100	TS-AGP project monitoring and progress reports
Proactively participate and contribute at pest management fora, and share experience in IPM	# of fora attended	0	15	-	TS-AGP project monitoring and progress reports

Appendix 2

RESULT FRAMEWORK FOR GAFSP INDICATORS

Project Results

Direct project beneficiaries

	Project Target	Reached as of 30 June 2016	Reached as of 31 Dec. 2016	Revisions to Project Target, if any
Total Beneficiaries	100 000	95 000	102 360 (127.95%)	No revisions made
% women	20%	19 000	20 104 (100.52%)	No revisions made
Youths (optional)	-	-	-	-
Full-time skilled/semi-skilled workers (optional)	-	-	-	-
Part-time unskilled workers (optional)	-	-	-	-

GAFSP Core Indicators

GAFSP Core Indicator	Baseline	Reached as of 30 Jun 2016	Current Value (31 Dec. 2016)	End of Project Target	Revisions
Number of client days of extension services provided to farmers, community members, etc. (disaggregated by gender)	0	52 259 (41 807 male and 10 452 female)	114 229 (92 525 male and 21 704 female)	60 000 (51 000 and 9 000 male and female client days respectively)	No revisions made
Number of farmers who have adopted the technology being promoted in forage development	0	6 016	6 256	1 720	No revisions made
Number of client days of training to raise agricultural productivity provided to scientists, extension agents, agrodealers, farmers, community members, etc. (disaggregated by gender)	0	22 561 (18 048 male and 4 512 female)	24 281 (19 424 male and 4 857 female)	20 480 (15 360 and 5 120 male and female client days)	• No revisions made. • Client days of trainings for SMS, extension agents and farmers are taken as 5, 3 and 1 and the total number of trainees respectively

GAFSP Core Indicator	Baseline	Reached as of 30 Jun 2016	Current Value (31 Dec. 2016)	End of Project Target	Revisions
Number of targeted clients who are members of an association, including producer association, cooperative, water user association, etc. (disaggregated by gender)	0	1 940 (1 552 male and 388 female)	2 869 (2 292 male and 574 female)	1 030 (824 male and 206 female)	No revisions made
Number of policies, strategies, frameworks or investment plans adopted	0	Four policy and strategy documents produced	Four policy and strategy documents produced and circulated to stakeholders for use	Initially, five separate documents on policy guidelines, strategy and road map were envisaged, but were reduced to four documents	Two strategies on IPM: i) IPM implementation strategy for Ethiopia; and ii) a strategy for the overall pest management support services for Ethiopia; and two documents completed for forage development: i) Forage Development and multiplication system for Ethiopia; and ii) Livestock Extension system in Ethiopia
Percentage of targeted clients satisfied with provided vocational training (Disaggregated by gender)	0	85-90% 2007 (1 606 male; 401 female [woreda and zone experts])	Same as previous	85%	No revisions made
Number of participants in M&E workshops, training events, seminars, conferences etc. (disaggregated by gender and affiliation)	0	4 241 (3 824 male and 417 female)	8 987 (7 190 male and 1 797 female)	150	• No revisions made. • In the calculation included # of training participants and exposure visit

Project-specific indicators

Project Indicator	Unit	Baseline	Previous Value (30 June 2016)	Current Value (31 Dec. 2016)	Current Target	End-of-Project Target	Disaggregated by gender
Trained government staff applying their new knowledge, experiences and skills in livestock feed production and management, and IPM promotion and reduction of pesticide use.	No.	Limited trained government staff in forage development and IPM	4 241	4 241	1 400	340	
Formulated policies, strategies and systems adopted by government:	No.	• No policy, strategy and guidelines to promote organized forage seed system, Livestock extension system for Ethiopia; • Absence of policy, strategy and guidelines to promote IPM implementation in Ethiopia	4	4	5	5	
Best practices adopted by farmer cooperatives and associations and /or CIGs	No.	Limited adoption of forage-related technologies	6 forage-related technologies	6 forage-related technologies	10 forage-related technologies	10 forage-related technologies	
	%	Crop production 100% pesticide dependent	10-33% reduced use of pesticides from baseline in pilot IPM-FFS	10-33 % reduced use of pesticides from baseline in pilot IPM-FFS	10-33 % reduced use of pesticides from baseline in pilot IPM-FFS	Reduce pesticide use by 50% in pilot IPM-FFS	

Project Indicator	Unit	Baseline	Previous Value (30 June 2016)	Current Value (31 Dec. 2016)	Current Target	End-of-Project Target	Disaggregated by gender
Number of technical manuals prepared on forage development and IPM	No.	0	4 draft guidelines being finalized: two on ration formulation and feeding guidelines and forage production; and two on IPM for DAs and farmers	3 training manuals/guidelines published and distributed: two on forage development, titled Livestock Ration Formulation and Feeding guidelines, and Forage Production, and national IPM guidelines for experts (1 000 copies each)	2 training manuals on IPM for DAs and farmers are drafted but not completed (to be carried forward)	Only two manuals initially foreseen for both forage and IPM	-
Fact sheets	No.	0	35	0	0	Not planned	-

Appendix 3

List of regions, zones and pilot woredas identified for project implementation

No.	Region	Zone	Pilot Woredas	Interventions	
				Livestock/ forage development	IPM
1	Amhara	North Shewa	Basona Werana	√	√
			Eftratana Gidim	√	√
			Antsokiya Gemza	-	√
2	Oromiya	North Shewa	Yaya Gulelie	√	√
		Bale	Agarfa	√	√
			Sinana	-	√
		Arsi	Limo Bilbilo	√	√
			Munessa	-	√
		East Shoa	Lume	√	√
3	SNNPR	Sidama	Wondo Genet	√	√
		Guragie	Enemorna Ener	√	√
		Siltie	East Azernet	-	√
4	Tigray	South Tigray	Ofla	√	√
			Raya Azebo	√	√
Total	4	9	14	10	14

Summary of forage development activities in selected FTCs, CIGs and watersheds covered during the 2006/2007 EC planting season

Woreda	FTCs		CIG farmers		Watershed			Remarks
	No.	Area (ha)	No.	Area (ha)	No.	Seedlings planted	Area (ha)	
Efratana Gidim	3	0.32	96	26.75	5		66.5	Mainly pigeon pea and 678 beneficiary households
Basona Werana	12	4.575	750	189.15	5	1 209 665	409	The watershed area is for the whole watershed, and not the area covered by the planted seedlings and 793 households
Raya Azebo	5	1.75	160	94.5	5	155 000	90.5	100 kg of pigeon pea planted in integration with agroforestry activities
Ofla	10	3.375	324					
Yaya Gulelie	6	23.82	400	12				
Lume	8	0.2445	17	18.5	1		0.08	
Limu Bilbilo	25	4.9	105	26.1	4	9 000 000		
Agarfa	13	1.4	104	17.6	1		1.52	
Wendogenet	4	NA*	134		1	30,000		
Enemor	52	10.875	2839	35	3	285 000	19.0	
Total	138	51.26	4 929	419.60	25	10 679 665	586.6	

*NA-data not available; the area indicated is the watershed area, and not the area covered by the forage

Appendix 4

PROJECT STAFF

Name	Function	Dates of Service	
		Starting Date	Concluding Date
Alemu Yami	Livestock Specialist	1 Jan. 2013	31 Dec. 2016
Edmealem Shitaye	Nation Team Leader	17 Feb. 2013	30 June 2014
Hussein Kebede		9 April 2015	31 Dec. 2016
Bayeh Mulatu	IPM National Consultant	1 June 2013	31 Dec. 2016
Alan David Robertson	Forage Development and Livestock Short-Term International Consultant	1 Nov. 2013	31 May 2014
		1 June 2014	30 Aug. 2014
Khaled Alrouechdi	IPM International Short-Term Consultant	1 Nov. 2013	31 May 2014
Ahmed Muhie	Driver	1 Feb. 2014	31 Dec. 2016

Appendix 5

MAJOR ITEMS OF EQUIPMENT PROVIDED

Quantity	Item	Cost (USD)
2	Toyota Station Wagon	100 904.89
3	Desktop computers	2 958.45
2	Laptop computers	1 852.05

Appendix 6

DOCUMENTS PRODUCED DURING THE PROJECT

IPM Implementation Strategy for Ethiopia (supported by a short-term international consultant- International IPM Expert). K. Alrouechdi. Addis Ababa, Ethiopia, May 2014. 60 pp.

Forage Development and Multiplication System for Ethiopia (supported by a short-term international consultant- Forage Development and Livestock). A.D Robertson. Addis Ababa, Ethiopia, November 2014. 72 pp.

Livestock Extension System in Ethiopia (supported by a short-term international consultant). A.D Robertson. Addis Ababa, Ethiopia, January 2015. 21 pp.

Pest Management Support Services Strategy for Ethiopia (supported by IPM National Consultant). B. Mulatu. Addis Ababa, Ethiopia, May 2014. 60 pp.

Forage Production: Reference and Training Manual for Ethiopia (supported by National Forage and Livestock Specialist). A. Yami. Addis Ababa, Ethiopia, June 2016. 215 pp.

Ration Formulation and Feeding Guidelines for Selected Livestock Species-Training manual (supported by National Forage and Livestock Consultant). A. Yami. Addis Ababa, Ethiopia, June 2016. 213 pp.

National IPM Guidelines under Smallholder Subsistence Agriculture in Ethiopia-Training manual (supported by IPM National Consultant). B. Mulatu. Addis Ababa, Ethiopia, December 2016. 270 pp.