



BENEFIT Partnership – 2019 Annual Report

Bilateral Ethiopian-Netherlands Effort for Food, Income and Trade Partnership

Dawit Alemu, Irene Koomen & Mirjam Schaap, Amsalu Ayana & Gareth Borman, Eyasu Elias & Eric Smaling, Helen Getaw, Gertjan Beccx & Monika Sopov, Geremew Terefe & Ted Schrader, Tewodros Tafere & Remko Vonk

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(updated version with revised reach data)

Dawit Alemu, Irene Koomen & Mirjam Schaap¹

Amsalu Ayana & Gareth Borman²

Eyasu Elias & Eric Smaling³

Helen Getaw, Gertjan Becx & Monika Sopov⁴

Geremew Terefe & Ted Schrader⁵

Tewodros Tafere & Remko Vonk⁶

1 PCU

2 ISSD

3 CASCAPE

4 ENTAG

5 SBN

6 REALISE

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Executive Summary

1. Introduction

The bilateral project entitled “Bilateral Ethiopian Netherlands Effort for Food, Income and Trade Partnership (BENEFIT Partnership) supported by the Dutch Government through the Embassy of the Kingdom of the Netherlands has, since 2016, been implementing four agricultural development programmes: ISSD – Integrated Seed Sector Development, CASCAPE - Capacity building for Scaling up of evidence based Practices in agricultural production in Ethiopia, ENTAG - Ethiopia-Netherlands Trade for Agricultural Growth and SBN – Sesame Business network. In 2018 a fifth programme, REALISE - Realising Sustainable Agricultural Livelihood Security in Ethiopia, joined the BENEFIT partnership. The Partnership aims at increasing food and nutrition security, brokering Dutch expertise, and stimulating trade. The focus of the 2019 activities have been (i) further demonstration of evidences for the agricultural transformation agenda and enhancing the engagement to communicate the evidences for effective embedment in development and policy; (ii) strengthening the alignment with relevant initiatives including the Agricultural Transformation Agency, the Agricultural Growth Programme, the Productive Safety Net Programme and other public programmes for synergy but also sustainability; (iii) creating evidences for scaling of product & place and thematic collaborative activities; and (iv) strengthening of the mainstreaming of crosscutting issues mainly gender and nutrition in all BENEFIT programmes.

The activities have been carried out together with regional partners, the Universities of Addis Ababa, Arba Minch, Arsi, Bahir Dar, Haramaya, Hawassa, Jimma, Mekelle, Oda Bultum, and Woldia, and the Regional Agricultural Research Institutes in Amhara, Oromia, Southern Nations Nationalities and Peoples Region and Tigray, and the Oromia Seed Enterprise. Mainstreaming evidence and engagement to ensure embedment and institutionalization were performed mainly through four channels: (i) regular engagement with Ministry of Agriculture through the monthly meetings with the state ministers, (ii) active engagement in the different technical committees and taskforces of the RED&FS, (iii) active utilization of opportunities that emerge from invitations to events and policy dialogues, and to be a member in different committees and taskforces in recognition of BENEFIT staff expertise and demonstrated evidences at ground level, and (iv) the engagement and communication of evidences by the BENEFIT seconded experts within the Ministry of Agriculture through their day-to-day engagement.

The 2019 annual report presents the major achievements under each of the BENEFIT outcome indicators followed by the major challenges faced, opportunities, key lessons learnt and the way forward.

2. Major achievements in 2019

The major achievements of the BENEFIT partnership are summarized based on the result chain outputs (Figure 1), which are related with (i) enhancing portfolio collaboration among BENEFIT programmes, (ii) increasing quality and quantity of agricultural production, (iii) improving markets and trade, (iv) improving the enabling environment for the agricultural sector, and (v) enhancing partnership for synergy.



Figure 1 Key partnership indicators: 2016 - 2019 achievements

2.1 Collaborative BENEFIT Portfolio

In 2019, BENEFIT implemented product-place combination interventions in 17 *woredas* in Amhara, Tigray, Oromia and Southern Nations Nationalities and Peoples Region (SNNPR) covering five priority crops, namely sesame, malt barley, soya bean, potato, and bread wheat and some minor activities on sorghum, mung bean and chickpea. The improved performance in the collaboration was associated with factors that include (i) collaborative planning that started from identifying relevant stakeholders at all levels; (ii) the focus on interventions that addresses the specific interest and needs of farmer and stakeholders; (iii) addressing issues across the value chain using complementary expertise of each BENEFIT programme; (iv) promoting public private partnership in the process; and (v) the attention given to apply inclusive agricultural development where gender and nutrition are incorporated across all activities. These factors were key to gain commitment of key stakeholders, ensure sustainability of activities, institutionalize best fit practices and approaches and influence key decisions makers towards sustainable change.

The main achievements/progresses made in empowering the five BENEFIT priority value chains were:

Sesame and integration of rotational crops: This was implemented through collaboration of ISSD, CASCAPE and SBN in Tigray and ISSD and SBN in Amhara. The collaboration in Tigray aimed at capacitating seed producers in seed production and marketing, strengthening relations among stakeholders along the sesame value chain and enabling seed producer cooperatives record expense and revenues through financial literacy training. The joint effort in Tigray has resulted in advanced knowledge and skills of seed producer cooperatives and experts in sesame production, improved the financial skills of seed producer cooperatives, increased use of mung bean for its economical, nutritional and environmental values, created a venue where specific sesame issues in the value chain are discussed, and contributed to the scaling up of sesame improved technology and commercialization. Whereas, the collaboration in Amhara aimed at enhancing the availability and accessibility of improved, farmer preferred, quality seed of sesame and rotation crops as part of promoting competitive, sustainable and inclusive sesame value chain. Accordingly, nine sesame improved varieties and eight soya bean varieties were introduced reaching 300 farmers. Trainings on financial management, accounting and cooperative marketing was also provided to seed producer cooperatives executive committee and members.

Malt barley: the collaboration between ISSD and CASCAPE for malt barley value chain development focused in deploying improved varieties and enhancing grain market linkage targeting Amhara, SNNPR and Tigray regions. The interventions related with improving the availability of improved varieties, local seed production by capacitating seed producer cooperatives, provision of training, promotion of cluster farming, facilitating market linkages through stakeholders' platforms and contract farming have improved the level of production and productivity and hence marketed surplus and increased availability of quality malt barely grains to malt factories. The created stakeholders' linkages is expected to sustain the achievements.

Soya bean: The collaborative effort among ISSD, CASCAPE and ENTAG on soya bean value chain development in Oromia region focused on addressing supply side constraints through deployment of improved varieties, market linkage and platform facilitation. This has resulted in (i) addressing challenges related to deep-rooted malnutrition, particularly protein and vitamin deficiency, severe land degradation and decreasing soil fertility in Oromia West, (ii) boosted production and productivity creating marketable surplus, and (iii) increased performance of cooperatives in the marketing of soya through ECX, which has incorporated soya as one of the commodities to be traded in 2019.

Potato: The collaboration in potato targeted the testing and validation of different improved varieties of potato along with creating improved access to the adapted and preferred varieties. The collaboration activities were among ISSD, CASCAPE and REALISE in Amhara and Tigray. The joint effort has resulted in improved access to quality seed with affordable price that has contributed to increased productivity in the target areas. With the enhancement of seed potato availability, the achievements are expected to expand through farmer-to-farmer seed exchange to other areas in addition to the formal seed potato promotion that will be undertaken by the formal extension system.

Bread wheat: the activity was implemented through a collaboration between ISSD and REALISE programmes in Amhara regions to demonstrate for possible scale up the improved performance of improved varieties in drought prone areas. This was implemented through crowd sourcing and participatory variety selection models along with introduction of associated agronomic practices and capacity development. This has considerably enhanced the use of improved, quality, farmer preferred varieties and good agronomic practices along with increased farmers knowledge on variety evaluation and selection. The achievement is serving as a "proof-of-concept" that a combination of socio-economic studies, scientific methods and participatory varietal selection is needed for effective delivery of varietal portfolios to farmers under PSNP context.

2.2 Quality and quantity of sustainable agricultural production

The different activities implemented in 2019 to ensure improved quality and quantity of sustainable agricultural production were related with (i) increasing the availability and use of quality seed of farmers' preferred varieties at affordable price and place, (ii) validation and testing of best fit agricultural practices and scaling along with associated *woreda* capacity development, (iii) interventions targeted to reduction of production cost especially in sesame producing belt of the Northwest part of Ethiopia, and (iv) awareness and capacity development for market based production as part of promoting sustainability.

Through these efforts the following achievements were recorded in 2019:

- A total of 2,029,894 smallholder farmers (both directly and indirectly) were reached in 2019 of which 29% were women and 30% youth through various activities of the five BENEFIT programmes with the objective of increasing the quality and quantity of sustainable agricultural production;
- In 2019, seed of 343 varieties of 20 crops was deployed to 15,661 smallholders. Support was given to 73 SPCs, 16 small and medium domestic private seed companies and four public seed enterprises to produce and avail quality seed;
- About 16 best-fit practice manuals were prepared, associated training was given to 809 (89 female) SMS and experts and 192 (4 female) researchers were trained on various topics;
- Eight platform meetings were organized by ENTAG that initiated discussion on pertinent challenges and opportunities in relation to improving quality and quantity of agriculture sustainability.

2.3 Improved markets and trade

In effort to promote market and trade development, BENEFIT programmes had implemented diverse activities in 2019 related with (i) enhancing the performance of the seed value chain, (ii) facilitating product and market development for sesame, (iii) facilitation of backward and forward market linkages, and trade and investment integration among local and foreign agribusiness companies.

- In order to enhance the performance of the seed value chain, (i) over 175 business linkages among seed producers and inputs, services and markets were facilitated; (ii) the Seed Information Exchange a digital platform for sharing information on seed availability (started to be piloted in all four public seed enterprises; (iii) facilitated high-level dialogue on constraints to foreign direct investment in the country among members of the Ethio-NL Seed Committee; (iv) the long-awaited directive on Unregistered Varieties advocated by ISSD was approved and it is expected to increase foreign direct investment and foreign currency reserves from seed export, and (v) innovations in seed value chains addressing bottlenecks in seed sector governance, supply of early generation seed, seed quality assurance and seed marketing were scaled in 2019.
- The main achievement of SBN in the area of product and market development was demonstration of evidence for promoting marketing credit to cooperatives through a risk-sharing scheme that can be fully scaled up at national level. The scheme innovativeness was evidenced through the recorded 100% repayment rate, increased trust and collaboration between farmers' organisations and financial institutions, better relations between farmers, cooperatives and unions.
- The facilitation of ENTAG of backward and forward market linkages, and trade and investment integration among local and foreign agribusiness companies made through (i) creation of market linkages for pulse export (500 t of pulse exported to India), between Dutch technology suppliers and local poultry farms for farm supplies and inputs such as cages, feed mills, hatcheries, day old chicks etc, and market linkages among several local business companies were also facilitated; these include feed producers with livestock farms, poultry producers with input importers, and legumes farmers with input suppliers; (ii) organization of trade mission for emerging eight Ethiopian poultry farms in Ethiopia to Rwanda; (iii) provision of technical support and Front-desk services to 108 private companies from spices, aquaculture and poultry sectors on access to improved markets, investment opportunities and trade; (iv) facilitation of stakeholders platform meetings for poultry, aquaculture, and spices sectors, where discussion were made on pertinent challenges and opportunities in relation to improving quality, access to finance, private sector role in the sector and public-private coordination in addition to facilitation of networking and creating business-to-business linkages; (iv) support to entrepreneurship through innovation fund provision, where two innovation fund grantees have completed project implementation (packing national food varieties, and

innovative and patented product development - Calcium supplement for livestock); and (v) promoting investment through preparation of business opportunity reports for poultry, spices and herbs, assessment of context sensitive investment and sharing to Dutch companies, support foreign investors in Kunzula area in ensuring integrated development, and promotion of skills and awareness creation for private companies, commercial farmers and cooperatives and Unions.

2.4 Improved enabling environment

As a programme that targets demonstration of evidences for agricultural transition, different interventions for improving the enabling environment have implemented by the different the BENEFIT partnership programmes and the BENEFIT portfolio. These interventions covered a range of activities including: (i) identification of relevant policy issues for further discussions based on prevailing challenges and opportunities, (ii) documentation of demonstrated evidences for the identified priority issues, (iii) engagement with relevant stakeholders to ensure the communication of demonstrated evidences through different forums mainly workshops, and (iv) contribution & facilitation of the design of new directives and regulations.

In the area of improved enabling environment for enhanced performance of seed value chain, ISSD has facilitated (i) consultative process that led to the publication of the strategic document 'Transforming the Ethiopian Seed Sector: Issues and Strategies', (ii) chaired the panel finalizing the draft national seed policy; has prepared amendments to the 2013 Seed Proclamation; contributed in the development of the draft Plant Breeders' Right Regulation; and is an active participant in the National Seed Advisory Group; (iii) early generation seed production and marketing through new plans and contractual agreements signed; and (iv) the Ethiopian Seed Association was backed in the advocacy to address identified policy constraints to private seed sector development in the new draft seed policy.

In effort to strengthen enabling institutional environment for the agricultural sector, CASCAPE facilitated high-level policy debate with policy makers including members of parliament, heads of extension programmes of public institutions to ensure the scaling up of the need to test and validate agricultural technologies in an integrated manner for improved adoption.

Through the different stakeholders' platform meetings and high-level engagements, ENTAG has been serving as a catalyst in the national and regional policy, strategy and institutional reforms and drafting of new regulations on Ethiopian poultry, spices, aquaculture and pulses subsectors. Accordingly, it has facilitated (i) an incentive package for investors in aquaculture and fisheries sector, (ii) drafting of the poultry marketing legal framework, (iii) approval and legalization of export of poultry feed to other countries; and (iv) drafting of a proposal for establishing Ethiopian Pulse Council, a public-private partnership entity.

Strengthening enabling environment for the sesame sector was facilitated by SBN focusing on (i) adaptation of a digital information system for the sesame sector, (ii) extending of the application of the *kebele* agro-economic planning tool to 50 *kebeles* and ensuring a buy-in from regional stakeholders, and (iii) preparation and sharing of several lessons learned, experience papers and issue briefs on strategic issues.

Through its system innovation pathway, REALISE has engaged in strengthening enabling environment under PSNP context. The major achievements in 2019 were (i) introduction of "the 1,000 Birr package approach", where farmers use half the recommended amount of inorganic fertilizers with the equivalent of farm generated compost per ha in an effort to enhance affordability, (ii) enhancing resilience of farmers by promoting diversification of production (poultry and small ruminants), and (iii) capacity building on matching, adapting, validating and scaling best fit practices.

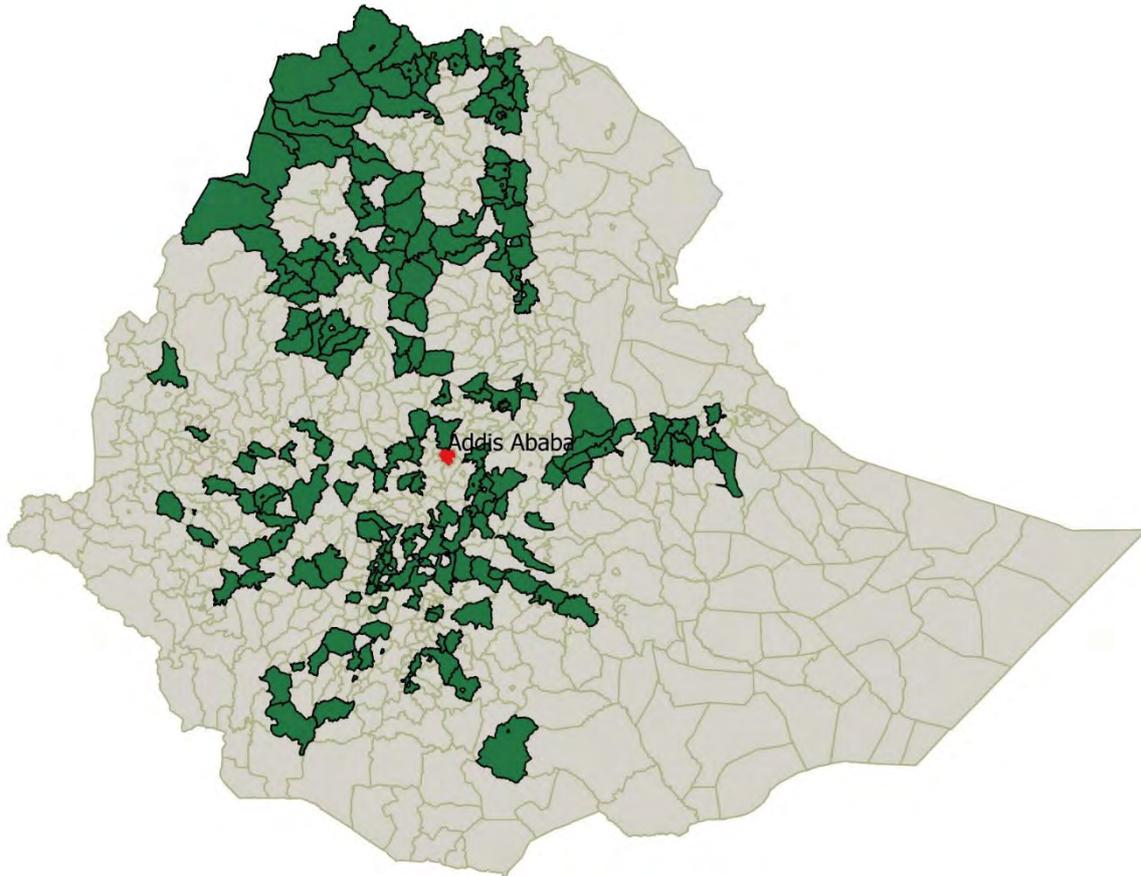


Figure 2 Overview map implementation woredas of all BENEFIT programme

2.5 Enhanced partnership for synergy

Coordination of the partnership for synergy among BENEFIT programmes and with other development programmes has been implemented by the BENEFIT Partnership Coordination Unit mainly through facilitation of (i) alignment of programmes and their collaboration; (ii) collaboration and alignment with other projects and programmes; (iii) facilitation of BENEFIT Level policy engagement; (iv) mainstreaming social inclusion and nutrition, and (v) fostering collaboration in BENEFIT portfolio.

Collaboration and alignment with other projects and programmes: The partnership has facilitated the formal and informal collaboration with relevant public and private initiatives at both BENEFIT and Programme levels to ensure effective alignment and synergy through:

- (i) The membership and active engagement in the newly restructured four technical committees of the RED&FS as BENEFIT have been instrumental to align and synergize efforts with relevant development partners. BENEFIT Partnership currently serves as co-chair for the agricultural input and output marketing development technical committee;
- (ii) the formal collaboration with ATA has enabled to jointly engage with relevant stakeholders in the areas of seed sector development, soil test based fertilizer application, sesame sector development, and also general agricultural market development;
- (iii) BENEFIT has continued collaborating with the Ministry of Industry in promoting investment in agro-industry parks, and
- (iv) BENEFIT partnership has continued in Engaging and facilitating the functioning of taskforces and technical committees like the National Seed Advisory Group, the Agricultural Development Partners Linkage Advisory Councils at national and regional level.

Facilitation of BENEFIT Level policy engagement: this has been implemented own facilitation and through participation in events organized by other partner organizations. Some of the important engagement were (i) regular engagement as BENEFIT with the relevant sectors of the MoA through

the monthly meetings; (ii) strengthening linkage among research-education-extension along with promotion of mandate zonation for member of the NARS; and (iii) active participation in different policy dialogues (institutionalization of ICT for agricultural extension, development of value chains, scaling climate-smart agriculture, Innovative Approaches to Evidence Uptake & Use in Africa etc.).

Mainstreaming social inclusion & nutrition: In 2019, BENEFIT PCU was mainly focusing on: (a) documentation and communication of gender and nutrition experiences and evidences of BENEFIT Programmes, (b) providing technical support and backstopping to BENEFIT programmes on nutrition and gender along with follow up and support the implementation of gender and nutrition collaborative activities, and (c) participation and sharing of experiences using the national level network meetings in the areas of gender and nutrition.

3. Major challenges, opportunities, lessons learned and way forward

The different BENEFIT programmes have been engaged in addressing the identified key challenges faced in the implementation processes. While it has been possible to address some of the challenges some of the challenges persisted and new challenges emerged:

- **The planned organizational restructuring within the MoA:** the limited clarity in the outcome of the on-going restructuring has influenced the different programmes to fully engage with relevant directorates and sections within the ministry for adequate embedding of demonstrated evidences;
- **Staff turnover including higher officials at all levels (federal, regional, zonal and woreda levels) in public and development partner organizations:** this has persisted resulting in limited timely implementation of planned activities esp. those related with policy engagements and in smooth mainstreaming of partnership for synergy;
- **Limited implementation capacity within the Ministry of Agriculture esp. in the area of policy, regulation and directives:** most of the approved directives and regulations are still to be implemented mainly linked with the limited implementation capacity. This demands active unplanned engagement in facilitation process at all levels;
- **Weak linkage with the national research systems and technology suppliers:** this has continued as key challenge in spite of the planned activities to address the problem. This has created limited access to required type, volume and number of technologies for testing, validation and/or scaling activities;
- **The moderate embedment of demonstrated evidences of BENEFIT Partnership:** this has remained as a challenge as some of the demonstrated evidences (validated technologies, financial literacy, policy options etc) by the different BENEFIT partnership programmes still require further engagement with relevant stakeholders to ensure their full adoption and sustainable utilization;
- **The short period of implementation for demonstrating more influential evidences:** this is the main challenge for the REALISE programme, which has only one production season making it challenging for demonstrating adequate evidences esp. related to issues relevant for policy for food insecure areas;
- **Low sensitivity of partners towards gender and nutrition:** there was a challenge to adequately ensure the mainstreaming of gender and nutrition related evidences due to the low interest and sensitivity at different levels;
- **Prevailing climate challenges:** the challenge persisted also in 2019 production in the form of unpredictable weather condition(drought, floods, frost), pest and disease incidence, especially for implemented activities related with testing and validation;
- **Programme staff turnover:** the staff turnover in some of the implementing partner organizations has demanded additional efforts from national staff creating compromises in timely implementation of some of the planned activities.

Opportunities

The main opportunities in 2019 were related with (i) endorsement of some of the strategic documents, (ii) increased interest of existing and emerging new initiatives to collaborate, (iii) engagement with the Rural Economic Development & Food Security committee (RED&FS) is creating an opportunity to communicate BENEFIT results, (iv) the increased visibility and continued recognition of the BENEFIT Partnership by stakeholders including policy makers.

- **The endorsement of some of the strategic documents** like the National Seed Transformation Agenda and Mandate Zonation for members of the national agricultural research system (NARS) is creating an opportunities for quicker adoption of demonstrated evidences;
- **Increased interest of existing and emerging new initiatives to collaborate:** this has continued in 2019, where there is increased interested to adapt BENEFIT demonstrated evidences in some of the initiatives like the agricultural commercialization clusters, integrated agro-industrial park. Similarly, there is high interest of other initiatives in collaborating on scaling BENEFIT demonstrated evidence by ATA, AGP, PSNP etc. This is a very good opportunity for synergy in scaling;
- **Engagement with RED&FS is creating an opportunity to communicate demonstrated evidences:** Currently, the BENEFIT Partnership is serving as the co-chair of the Agricultural Input and Output Marketing Development technical committee, as a member of Agricultural System Transformation technical committee, the Policy and Governance taskforce, the Extension and Capacity Building taskforce, and the Agricultural Research and Technology taskforce;
- **Increased visibility and recognition to BENEFIT Partnership:** This has facilitated continuous engagement with relevant stakeholders including policy makers, which is important for increased influence and wider impact of the BENEFIT partnership efforts. Senior staff of BENEFIT partnership are invited to many different engagements and taskforces.

Key lessons learnt and the way forward

The general key lessons learnt and the way forward for BENEFIT and its programmes were:

- Creating partnership for synergy demands adequate flexibility and follow up. Working in partnership with other initiatives eases the mainstreaming of evidences and engagement with policy makers. Accordingly, strengthening and mainstreaming of alignment will continue;
- The embedding of senior experts of the BENEFIT partnership, on seed systems, extension and sesame, in the Ministry of Agriculture contributes to the uptake of BENEFIT generated policy advice;
- Mainstreaming of gender and nutrition evidences requires working with existing networks like with National Gender Equality Network. This facilitates sharing of experiences and possible mainstreaming;
- Consideration of the specificity in terms of agro-ecology and socioeconomic aspects of target beneficiaries for demonstrating evidences played important role;
- Linked with the priority given to embedding and institutionalization of evidences and innovations demonstrated over the last four years of implementation of the different programmes of BENEFIT, we will continue ensuring partnership of synergy in the effort for sustainability of demonstrated evidences;
- Implementation capacity of the public sector is a key factor for successful mainstreaming of evidences in policy and development processes;
- Documentation of demonstrated evidences as a tool for engagement with policy makers and development practitioners continues to be very crucial. Accordingly, due attention will be given to document the demonstrated evidences of BENEFIT programmes in 2020.

1 Introduction

The 2019 BENEFIT annual report presents the fourth year of implementation of the BENEFIT Portfolio, which unites five programmes namely ISSD, CASCAPE, ENTAG and SBN and REALISE, and the umbrella unit PCU.

Along with the continued implementation of planned activities at field level to demonstrate evidences, the 2019 interventions targeted communicating and directly engaging with policy makers and other stakeholders to ensure embedding the diversity of demonstrated evidences by the different BENEFIT programmes. There were four major channels used in communicating the diverse evidences. The first was through the regular engagement with the Ministry of Agriculture (MoA) through the continued monthly meetings with the state ministers. The second channel was through active engagement in the different technical committees and taskforces of the RED&FS that has enabled to communicate better the demonstrated evidences. Currently, the BENEFIT Partnership is serving as the co-chair of the Agricultural Input and Output Marketing Development technical committee, as a member of Agricultural System Transformation technical committee, Policy and Governance taskforce, Extension and Capacity Building taskforce, and Agricultural Research and Technology taskforce. The third channel was active utilization of opportunities that emerged through invitations in recognition of BENEFIT staff expertise and demonstrated evidences at ground level by the MoA, the Ethiopian Institute for Agricultural Research (EIAR), and other development partners to participate in policy dialogues, events and to be a member in different committees and taskforces. To mention a few, engagement in seed sector transformation, promotion of ICT based extension system, mandate zonation for the members of the National Agricultural Research System, development of priority value chains, promotion of agricultural mechanization, revision of the national rice sector development strategy, and agricultural research agenda setting. The fourth channel has been through the engagement and communication of evidences by the BENEFIT seconded experts within the MoA through their day-to-day engagement.

This annual report is structured based on the result chain and considers the achievements made, challenges faced and lessons learned by the five BENEFIT Partnership programmes and the PCU. Accordingly, the report covers achievements in the areas of (i) Collaborative BENEFIT portfolio, (ii) increasing quality and quantity of sustainable agricultural production, (iii) enhancing market dynamics, (iv) improving enabling environment, and (v) enhancing partnership for synergy. Selected write-ups of lessons learned demonstrated by the different programmes are presented (Appendix 1), detail of the food & nutrition security indicators (Appendix 2) as are the detailed annual reports of the respective programmes (Appendix 3 to 7).

2 Collaborative BENEFIT portfolio



BENEFIT partnership product-place strategy aims at implementing diverse activities for a specific commodity in a specific target area by engaging BENEFIT programmes based on their respective areas of expertise and consideration of the whole value chain of a commodity. This strategy helps the partnership to achieve results and demonstrate evidences in an integrated and synergetic manner to farmers, practitioners and policy makers.

In 2019, BENEFIT implemented product-place combination interventions in 17 *woredas* in Amhara, Tigray, Oromia and Southern Nations Nationalities and Peoples Region (SNNPR) covering five priority crops, namely sesame, malt barley, soya bean, potato, and bread wheat and some minor activities on sorghum, mung bean and chickpea.

The collaborative activities that mainly focused on addressing challenges related with the seed system, productivity, market and policy have registered impressive results. The major success factors for increased interventions and successes include (i) collaborative planning that starts from identifying relevant stakeholders at all levels; (ii) the focus on interventions that addresses the specific interest and needs of farmers and stakeholders; (iii) addressing issues across the value chain using complementary expertise of each programme; (iv) promoting public-private partnership; and (v) the attention given to apply inclusive agricultural development where gender and nutrition are incorporated across all activities. These factors were key to gain commitment of key stakeholders, ensure sustainability of activities, institutionalize best-fit practices and approaches and influence key decisions makers towards sustainable change.

Nevertheless, there were a few activities in the areas of policy engagement, demonstration, field exposure visits, and seed multiplication in Tigray and financial literacy to seed producer cooperatives (SPC) members in Metema of Amhara that were planned but not implemented due to the unstable security situation in some parts of the country and limited budget and seed source.

2.1 Sesame: value chain development and integration of rotational crops

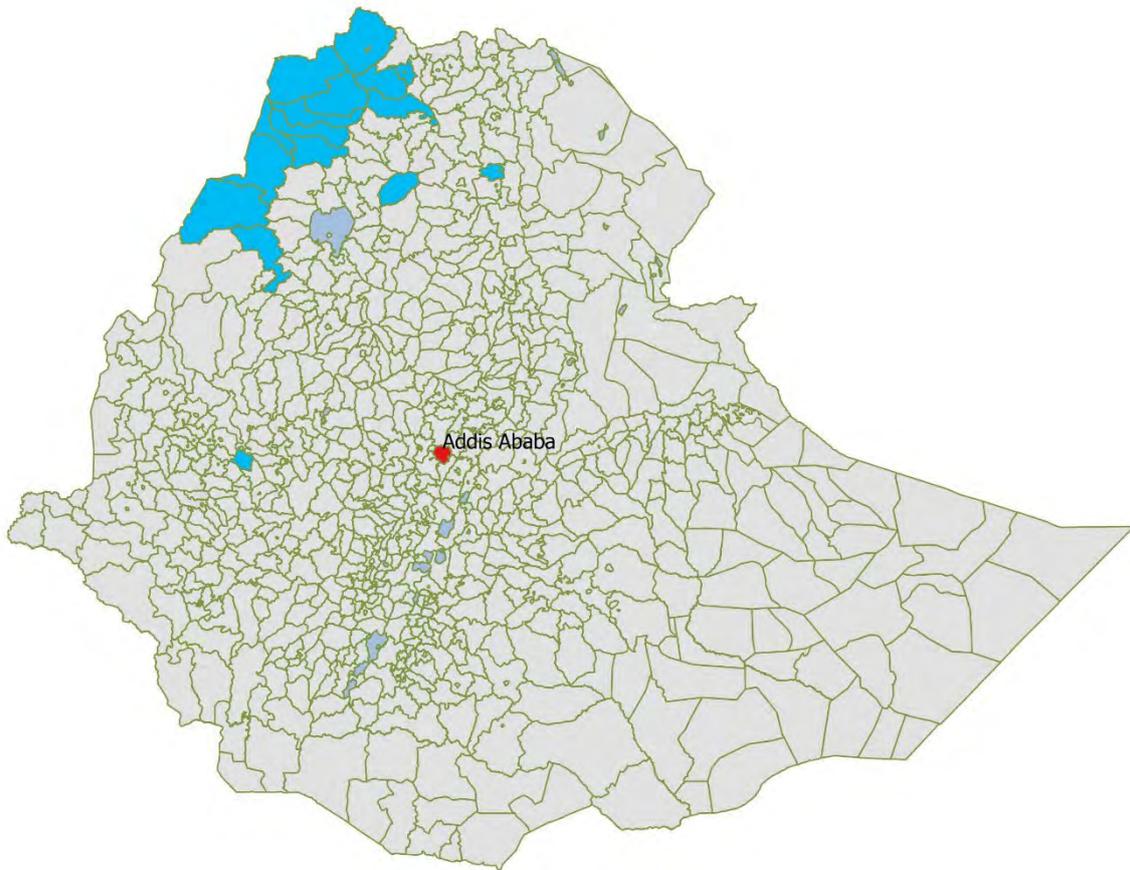


Figure 3 Target areas of BENEFIT collaboration to empower sesame value chains

Tigray

In response to seed producers' lack of skill and knowledge to produce quality sesame seed and grain, the collaborative effort among CASCAPE, ISSD and SBN in Tigray aimed at capacitating seed producers in seed production and marketing, strengthening relations among stakeholders along the sesame value chain and enabling SPCs record expense and revenues (financial literacy).

Some of the key activities implemented included training of 67 (59 male and 8 female) experts and SPC members from Welkayit, T/Adyabo, K/Humera, Tselemiti and Asgede Tsimbila *woredas* on sesame and rotational crops production, quantity sesame seed production, financial literacy, seed system, seed business, value chain development, and awareness creation on environmental degradation. In addition, with collaboration with Humera Agricultural Research Centre (HuARC) row planter and operator were provided to Wuhdet SPC in k/Humera *woreda* to demonstrate the technology for scaling.

The collaborative effort in Tigray resulted in advanced knowledge and skills of SPCs and experts in sesame production, improved the financial skills of SPCs, increased use of mung bean for its economical, nutritional and environmental values, created a venue where specific sesame issues in the value chain are discussed, and contributed to the scaling up of sesame improved technology and commercialization.

Amhara

Supporting a competitive, sustainable and inclusive sesame value chain through increased productivity and market linkages is one of the collaborative activities implemented in 2019 in Amhara region. The activities implemented by SBN and ISSD were designed to address issues related to the production and distribution of improved, farmer preferred, quality seed of sesame and rotation crops.

In 2019, with an overall aim of enhancing the availability and accessibility of improved seed in Quara and Metema *woredas*, the programmes partnered with Gondar Agriculture Research Centre (GARC) to provide training of trainers (ToT) on concepts of crowd sourcing (CS), participatory variety selection (PVS), gender, nutrition, finance, and ClimMob software to selected farmers, government officials, experts, development agents, SPC members. Nine sesame improved varieties and eight soya bean varieties were introduced reaching 300 farmers (150 for sesame and 150 for soya bean). Trainings on financial management, accounting and cooperative marketing were also provided to SPC executive committee and SPC members.

Overall, the CS and PVS approaches not only provided options for farmers to evaluate different types of varieties through their own management but served as a seed source for host and neighbouring farms. Women farmers (81 or 40.5%) participated in variety evaluation of CS and PVS trials and made selection against their own criteria. The trainings enhanced the capacity of farmers on cooperative management, quality seed production and post-harvest handling, and the platform served for sesame seed sector actors to discuss core challenges and set directions. Awareness on gender issues was promoted to SPC management committees, *woreda* agricultural experts and farmers.

2.2 Malt barley: deploying improved varieties and grain market linkage

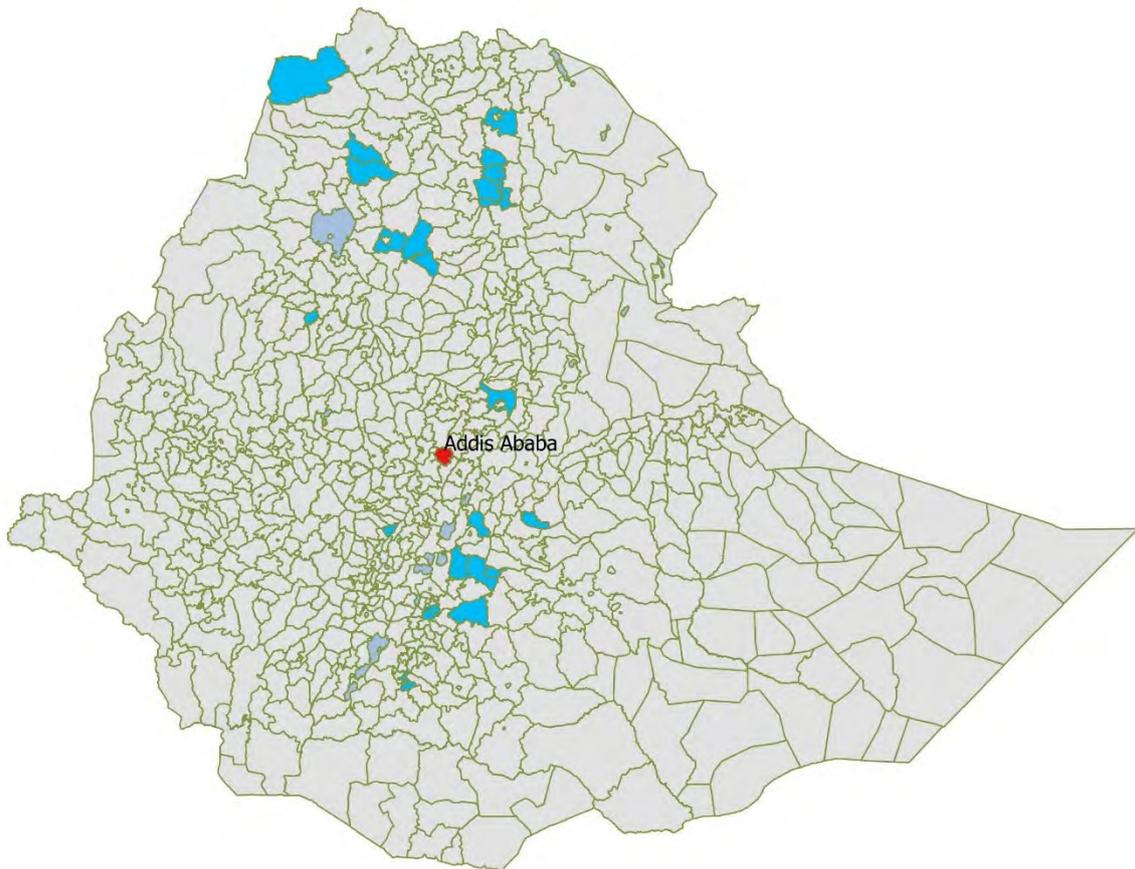


Figure 4 Target areas of BENEFIT collaboration in malt barley

Malt barley offers huge opportunities for farmers as a cash crop, and for the country as import substitution. Challenges with malt barley are however the required quality by the malt factory. As such BENEFIT has been working with stakeholders on production, management and quality of improved malt barley varieties.

Tigray

Malt barley is a newly introduced crop following the establishment of the Raya brewery in the region. The local community has limited knowledge on how to access quality seed and produce standard grain malt barley. In addition, there is limited availability of improved varieties of malt barley with required quality requirements. To address this situation, stakeholders were involved to start contractual malt barley production as well as value chain development. However, these efforts were not well integrated, limited to two trial sites and did not cover the whole malt barley value chain. To enhance malt barley production and marketing, training was provided to farmers on quality seed production and marketing, demonstration trials conducted, farmers were supported to enter into contract farming, a regional malt barley platform was established, market linkages created and exposure visit to successful malt barley producers in different areas were organized.

As a result of this collaboration, a malt barley regional platform was established, execution of training on quality seed production and marketing to *woreda* experts and members of three SPCs, a total of 289 grain producing farmers (17% female) from the three *woredas* were trained in malt barley production, marketing and contract farming, 45 executive members of 9 SPCs were trained in management of cooperatives, five quintal of basic seed was procured and supplied to Hadnet Raya seed union for seed multiplication, a new partnership was created with Global malting service, seed production, demonstration and adaptation trials and field days were conducted in two *woredas*, 2.3 ton (t) of certified seed was collected by Hadnet Raya seed union from SPCs, a total of 62.2 t grain malt was collected by Global malting service for Raya beer factory. The established regional platform is expected to sustain and expand the demonstrated evidences to other potential areas and stakeholders in the region.

SNNPR

In SNNPR, linked with the agro-ecological suitability and proximity to Asela malt factory, collaboration on malt barley was done in Malga and Gumer *woredas*, where a number of smallholder farmers are present that could reasonably allocate part of their land for malt barley cultivation. The core objective of the collaboration hubs were: i) to put in place the malt barley seed system; ii) to establish and strengthen the malt barley value chain development, and iii) to further foster its institutionalization in the research and extension system. Activities included value chain analysis, participatory varietal selection, demonstration and pre extension demonstration, capacity building and stakeholders' engagement.

Some of the achievements as the result of the collaboration were improved access to seed of preferred varieties, production of quality malt barely seed and grain, output market linkage, establishment of functional multi-institutional platforms, involvement of women in leadership of cooperative, and institutionalization of best-fit packages for malt barley. In the 2019 reporting period, 37 farmers, of which 8% women, were involved, covering the total area of 25ha malt barely seed production. The average seed productivity of malt barely in Malga and Gumer was found to be 4.5 and 3.6 t/ha respectively, as compared to farmers practice, an increase of 253% was observed. To achieve this, suitable agro-ecology, public-private partnership, proximity of market were some of the success factors resulting in import substitution. Overall, the intervention was deemed successful through an increase in production area to 10,000ha, increased productivity to 3.75 t/ha, and output market creation that contributed to increase volume of supply to the malt factory (1,800 t since 2014).

Amhara

In Farta *woreda*, malt barley production and marketing started some years ago. However, the introduction of new varieties was very minimal in the *woreda*. Activities have focused on strengthening the malt barley value chain through introduction of newly released varieties, capacity building of subject matter specialists (SMSs), development agents (DAs) and farmers, improving access to seed, linking the product with market and establishing a malt barley platform. Major accomplishments were: i) access to certified basic seed of malt barley to Addis Alem SPC by identifying the sources, linking the cooperative with the supplier and provision of basic seed to cooperative, ii) cooperative organization and seed marketing to cooperative committee members, and seed marketing and business planning to SMS and DAs, iii) the cooperative was linked with seed regulatory body, seed extension, seed union, and seed buyers, and iv) strengthening of the malt barley regional platform. A gender gap analysis for the seed-

producing cooperative was completed and documented, training was provided to cooperative members on gender balance and awareness creation event on nutrition was facilitated.

2.3 Soya bean value chain development

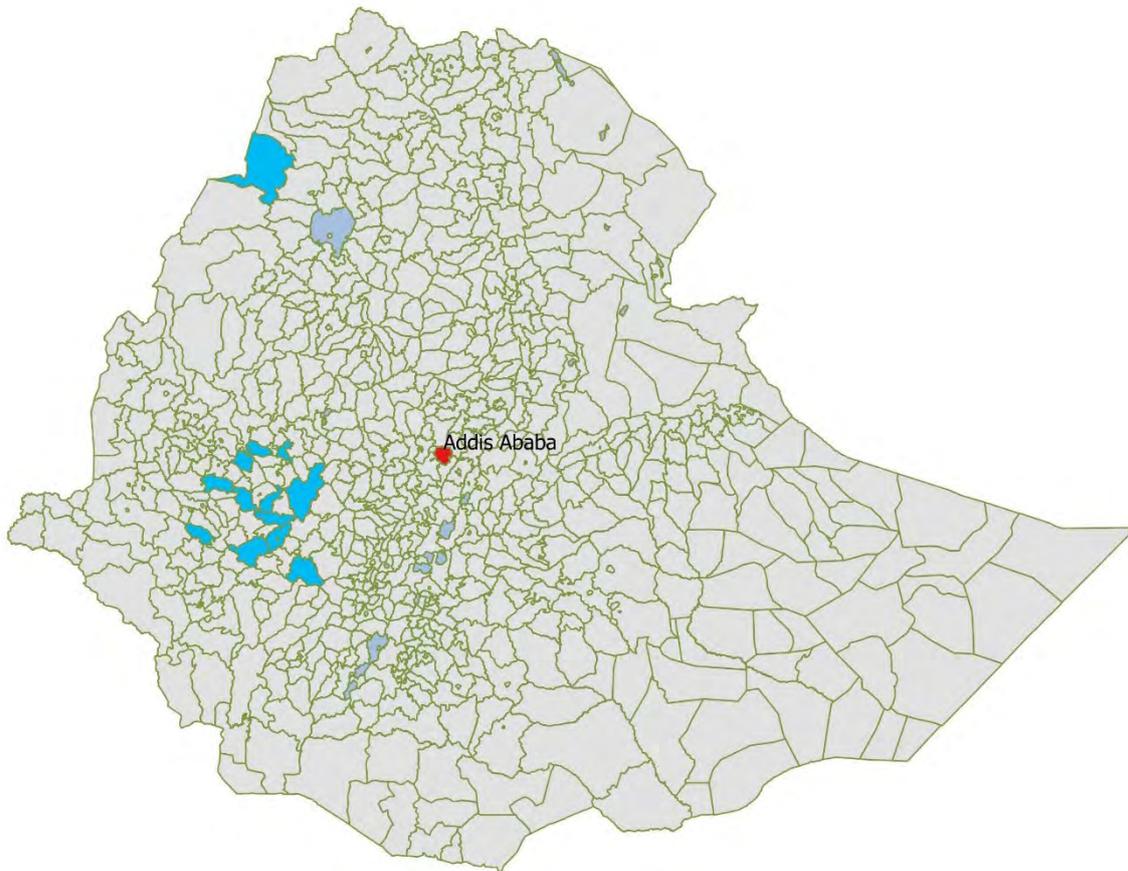


Figure 5 Target areas of BENEFIT collaboration in soya bean

Soya bean value chain development in Oromia region started to address challenges related to the deep-rooted malnutrition, particularly protein and vitamin deficiency, severe land degradation and decreasing soil fertility in Oromia West. Despite organized as well as unorganized efforts by different stakeholders, and a steady increase in soya bean production by smallholder farmers, the soya bean value chain remains fragmented.

Therefore, in 2019, a BENEFIT collaborative effort among CASCAPE, ISSD and ENTAG on soya bean value chain development at Wayou Tuka and Chora *woredas* focused on supply side constraints, market linkage and platform facilitation. Awareness creation campaigns were conducted in five *woredas* to promote soya bean production. These campaigns were well received by the farming community because of the recent attention given to soya bean by the government and inclusion of soya bean in ECX market. In 2019, BENEFIT Partnership was also engaged in supporting the agricultural growth programme (AGP) scaling up effort to reach more than 14,000 farmers with improved soya bean varieties in 45 *kebeles* found in 7 *woredas*. These have resulted in increased soya bean production in the *woreda*.

Soya bean seed producing common interest groups (CIG) were organized in Chora *woreda* and necessary support including capacity building on quality seed production and internal seed quality control mechanisms were provided. Cascading of ToT was successful reaching more than 4000 farmers. In addition, a meeting on the delivery of soya bean seed was organized and attended by 55 participants.

Towards institutionalization of soya bean technology, three soya bean varieties along with recommended and validated good agricultural practices that enhance productivity and quality were performed. In addition, a policy brief document on soya bean value chain intervention was prepared and shared.

In relation to market linkage, the platform was used to link grain producers to seed sources in Wayu Tuka and other *woredas* in the region. Eight primary cooperatives, ready to supply over 13,000 t of soya bean, were linked to nine soya processing companies.

2.4 Potato: Strengthening the value chain

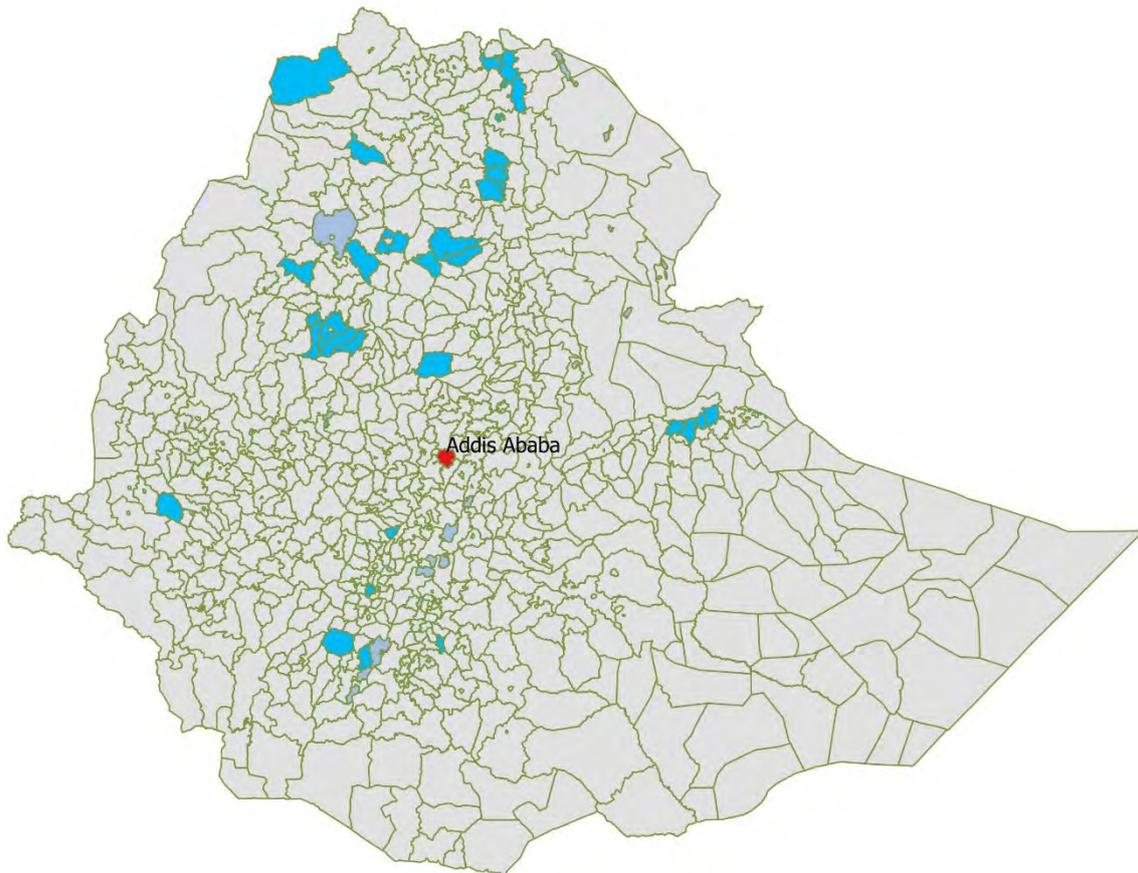


Figure 6 Target areas of BENEFIT collaboration in potato

Amhara

In Farta woreda, Amhara region, potato is a widely grown as food security crop. However, unavailability of improved seed potato, problems with pest and diseases, low soil fertility, poor agronomic practices and poor access to markets are major constraints responsible for low productivity and limited expansion of potato in the region. Therefore, the 2019 collaborative effort of ISSD and CASCAPE started with an overall objective to improve productivity of potato through production of disease free seed potato, capacity building of DAs, experts and farmers, improving seed access, creating linkage with market and establishing potato platform.

The major activities undertaken were provision of basic seed to selected farmers, improving the structure of an existing screen house, provision of supporting grants for net purchase, linking producers with market, and enhancing capacity of producers and partners at woreda level to ensure sustainability. Training was given to 24 members of cooperative and *woreda* experts on seed potato production, gender and nutrition and cooperative marketing. In order to promote and scale up the activities of producing seed potato in the screen house, various communication channels were used to

share the lessons learned, including organizing a field visit where 39 people from universities, producer cooperatives, agriculture offices, NGOs and seed core group members visited the cooperative. The potato platform and steering committee meeting were also used to discuss challenges, prioritize key issue and follow up on actions points.

As a result of this collaboration, the productivity of the seed potato increased from 35 t/ ha to 66 t/ha in the target areas, now farmers can access quality seed with affordable price, their income has increased (one farmer made 80,000 birr from 0.01ha), and knowledge of farmers on screen house management, seed handling and production enhanced. In addition, partners and SPCs are interested to scale up the activities, and SPCs are motivated to expand and increase production. Overall, 1.9 t of disease free quality seed potato was produced and distributed among 6 farmers and 29 t of 2nd generation seed produced and collected by nearby SPC to be sold to the surrounding farmers.

Tigray

Testing, validation and pilot scaling of high yielding and disease resistant potato varieties was conducted in Tigray for the last three consecutive years (2016 - 2018). In 2019, CASCAPE and REALISE in collaboration carried out PEDs of Belete potato variety in Alaje Woreda. The demonstration engaged 10 farmers (6 male and 4 female), where the programme supplied 100 kg of Belete seed tuber, planted on 1250 m² of land.

A total of 1000 kg of improved potato tuber was collected by Shewit SPC, a regionally certified disease-free potato seed supplier, to be sold to the surrounding farmers. Due to the application of improved management practices, the mean tuber yield was 32.5 t/ha, which is higher than the regional 24.7 t/ha reported by CSA 2018/2019. This clearly demonstrates that higher potato yield can be obtained with close support and improved management.

2.5 Bread wheat: value chain development

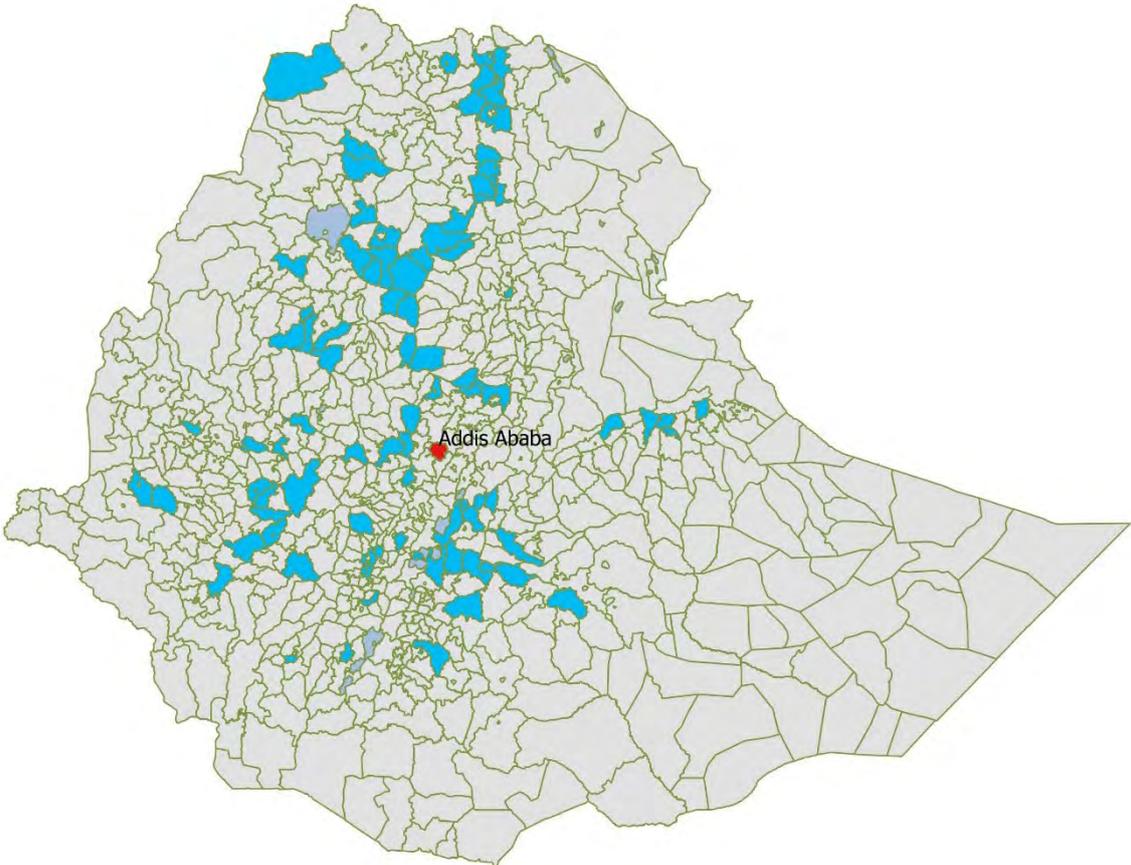


Figure 7 Target areas of BENEFIT collaboration in bread wheat

Amhara

The low productivity of bread wheat in Amhara region is mainly due to pest and diseases, frost, poor soil fertility, moisture stress (water logging and moisture deficit) and low yielding varieties. In response, the 2019 REALISE and ISSD implemented activities to increase productivity of bread wheat for Productive Safety Net Programme (PSNP) farmers in Dabat and Meket *woredas* through use of improved, quality, farmer preferred varieties and good agronomic practices.

Using CS and PVS models, BENEFIT introduced different varieties of bread wheat from regional and national research centres, provided trainings on CS and agronomic practices, and provided continuous technical support during the cropping season. In Dabat Woreda 250 farmers participated (38% females and 35% youths) while in Meket woreda 95 farmers participated (54 females and 64 male). Farmers from the districts evaluated, identified and made their variety selection based on their own criteria.

These activities have increased farmers knowledge on variety evaluation and selection process. Crop and varietal diversity and quality seed demand for several new, improved and adapted crop varieties have increased. Large number of farmers observed the performance of CS and PVS trials during field days. The methodology used served as a “proof-of-concept” that a combination of socio-economic studies, scientific methods and participatory varietal selection is needed for effective delivery of varietal portfolio to farmers.

3 Increased quality and quantity of sustainable agricultural production



ISSD, CASCAPE, SBN, REALISE and to a lesser extent also ENTAG, have contributed to the objective of increasing the quality and quantity of sustainable agricultural production in 2019. ISSD targeted improving the availability and use of quality seed of new, improved and/or farmer preferred varieties. CASCAPE with a focus on AGP *woredas* does so through testing and validation of best fit agricultural practices and making these available for dissemination, working together with *woredas* to increase the capacity to develop and implement agricultural development plans, including strategies for scaling and a focus on diversification of agricultural production with attention to nutrition. SBN targeted enhancing sesame production and cost of production reduction. REALISE with a focus on PSNP *woredas* works on improving access to quality seed of preferred varieties, development of best-fit practices, capacity development of beneficiary farmers and partners, and addressing issues related with enabling environment. ENTAG in this regard, facilitates creation of pull factor for increased production through improved market access and stakeholders' linkage.

Summary achievements



2,029,894 farmers reached with increased productivity (direct and indirect)

140,904 farmers reached directly: 29% ♀ and 71% ♂; 30% youth under 35 years.

972,482 farmers reached with improved access to input markets

61,692 persons reached/trained with improved technology and skills:
38% ♀ and 60% ♂; 28% youth under 35 years.

180,261 trained farmers in sustainable agricultural production & practices:
39% ♀ and 61% ♂; 33% youth under 35 years.



341,338 of hectares of farm land used more eco-efficiently (direct and indirect)

3.1 Outcomes achieved by BENEFIT programmes

ISSD – Increased availability and use of quality seed

Since 2016, the availability and use of quality seed of over four million farmers has improved as a result of ISSD’s interventions. In 2019, direct support was given to 26,309 individual seed producers. These include: 15,661 participants in PVS and CS; 73 SPCs; 16 small- and medium-sized private seed producers (PSPs); four public seed enterprises (PSEs); and several international breeding companies. Selected SPCs and PSPs produced 21,268 t of quality seed of grains, legumes and oilseeds; 1,090 t of seed potatoes; 65,500 mango, avocado, papaya and lemon tree seedlings and 3,120,000 sweet potato cuttings. In general, 343 varieties of 20 crops were deployed across 181 villages in 52 *woredas* of the country through PVS and crowdsourcing to generate demand for new and improved varieties. ISSD supported seed producers are profitable. About 88% of audited SPCs and 100% of all PSPs reported profits last year. Looking at other key performance indicators (KPIs), improvements across all four regions are observed. Women’s participation in the programme has more than doubled since 2016 to 35% of all farmers that were involved in programme activities in 2019. Through ISSD interventions, quality seed of 392 varieties of 35 crops became available, thereby making a significant contribution to food and nutrition security and climate resilience in the country.

Several SPCs face significant challenges in generating increased working capital to step up seed production by its members. The Koticha Kuyu Seed Producer Cooperative in West Shewa took up the suggestion of ISSD and the Regional Cooperative Promotion Agency (RCPA) to establish a Rural Saving and Credit Cooperative. This helped SPC members to obtain collateral free credit for interest rates between 1 and 5% and solved the capital constrains of the SPC.

The image shows two handwritten spreadsheets. The left one is titled 'Ottanama Dargama' and has columns for 'Ganyaa', 'Galla', 'Basaal', 'Dikala', and 'Maddaha'. The right one is titled 'Ottanama Fedra' and has columns for 'Galla', 'Basaal', 'Maddaha', 'Maddaha', 'Maddaha', and 'Maddaha'. Both tables contain numerical data for various entries.

CASCADE - Best fit agricultural practices & Scaling and woreda capacity development

CASCADE made a major leap in generating and scaling demand-driven innovations and best-fit practices (BFP) to increase quality and quantity of sustainable agricultural production. Farmer reach and area of farmland covered by CASCADE validated BFPs gone beyond the target set at the planning stage. This is mainly due to the organic scaling activities of the *woredas* supported by AGP. Yields of all crops tested have increased >50% hence contributing towards national and regional food security and household income. The establishment of a large number of home gardens and field crop (pulses, potato) demonstrations contributes towards household diet diversification and promotion of nutrition-sensitive agriculture. The BFP manuals delivered to the extension system and the technical skill training provided to experts at woreda and *kebele* levels contributes immensely for the sustainable production. More importantly however, participation of almost 865,000 of farmers in the testing and validation, scaling and on-spot training empower them to continuously innovate adapt agricultural technologies to their local conditions. The simplified extension training materials prepared in local languages and placed at farming training centres (FTCs) are important channels of information to experts and farmers.

ENTAG

ENTAG conducted several interventions in 2019 to increase the quality and quantity of sustainable agricultural production in the poultry, aquaculture and spices sectors through provision of:

- **Technical support:** 108 companies, entrepreneurs and SMEs got sector information, farm visit and operational advices.
- **Awareness creation:** ENTAG organized platform meeting to emphasize the critical situation of bio-security hazard in the country in the poultry sector, which resulted in relevant bodies taking the responsibility to devise a strategy to control and set up a safe bio-security system.

- **New Technology:** Spice cleaning, sorting, grading, polishing and pulverizing machines from India, along with solar drying technology, one modern spice packaging machine and one high duty turmeric slicing proto type machines have been introduced to sector actors and supporting research centres to improve the quality of spices and herbs.
- **Capacity Building:** ENTAG also organised ToTs for responsible government representatives on slaughterhouse inspection; gave slaughtering training for poultry sector company representatives, business management training for poultry start-ups; and entrepreneurship trainings for hosted interns.

SBN – Production cost price reduction

For six subsequent years, it has been evidenced that sesame yields can be doubled and production costs can be significantly reduced. Farmers can earn thousands of birr extra per hectare and the country can earn millions of dollars more. There is high interest and slow but steady progress towards the adoption of the '20 steps' extension package. Most farmers are partial adopters. This is due to the fundamental challenges: lack of input finance, seeds and agro-inputs and options to acquire machinery. Briefs for policy makers have been prepared to address these and other challenges. Field guides are available for sesame, sorghum, soya and mung beans and cotton. With the attention for rotation crops and home gardens, SBN has demonstrated the potential for a more balanced farming system and diet, and for reduction of production and market risk facing farmers. The training of farmers in record keeping and cost-benefit analysis has reached more than 20,000 farmers in the sesame zone. It improves farmers' entrepreneurial outlook and eligibility for input finance. After MoA has adopted financial literacy training as a component of the national agricultural extension system, hundreds of DA's and thousands of farmers were additionally trained at national level.



SBN supported the promotion of rotation crops in the sesame dominated areas. Emphasis was put on improving sorghum production and marketing, and introducing soya and mung bean. The pulses contribute to soil fertility management, reduced incidence of pests and diseases, have a market potential and provide proteins in the diets of farmers and farm labourers. Short cycle mung bean varieties also contribute to climate change adaptation. Following the pilot lessons were documented and recommendations for diversifying farming and marketing systems were formulated.

REALISE - Practices, seeds and capacity building

The REALISE programme contributes to increased quality and quantity of agricultural production through its practice, seed and capacity pathways. A number of activities (about 130) were conducted in 2019 by the REALISE clusters on validation, demonstration, pre-scaling and crowdsourcing based on farmers priority problems. The crowdsourcing was conducted to increase diversity of crop varieties and thus choices for farmers. In the practice pathway, 68 best-fit practices have been identified based on productivity, farmers' preferences for taste and marketability. Some of the introduced crop varieties and practices (such as orange fleshed sweet potato, papaya, green leafy vegetables, quality protein maize) contribute to nutrition security and household dietary diversity. Improved practices for the staple crops such as maize, sorghum, barley, teff for increased productivity have helped the PSNP households to close or narrow the food gap. The use of the best-fit practices increases yield of crops of participating farmers by 81-1073% compared with baseline data. Farmers' selected crop varieties for various purposes and specific adaptation. Open pollinated Melkassa maize varieties are preferred for low-moisture stress areas while BH661, which is relatively long maturing variety, is selected for areas with better rainfall. Early maturing sorghum and teff varieties have been selected for areas with low rainfall while long maturing but high yielding varieties were selected by farmers for areas with better rainfall. Seed crowdsourcing and other trials diversified crop varieties up to 1500% compared with baseline data and enabled farmers to access improved varieties of crops. The training provided to researchers and extension experts will help them to match, validate and scale best-fit practices.

The standardized extension package for wheat designed for 0.5 ha of land is costly and unaffordable for farmers with small landholdings in PSNP areas. REALISE developed a wheat extension package with seed and fertilisers for one timad (0.25 hectare) at a cost of 1000 birr (30 USD) and combined it with agronomic recommendations, interest free credit and hands on training and follow-up. This resulted in almost a 60% increase in yield, and when used in combination with compost to an almost 120% increase in yield in farmers' fields.



4 Improved markets and trade



ISSD, ENTAG and SBN, contributed through various activities to the objective of improved markets and trade. ISSD does this through enhancing the performance of the seed value chain. ENTAG contributed through increasing the performance of key sub-sectors and enhancing B2B linkages. SBN support the development of sesame products and markets.



35,094 farmers reached with improved access to output markets



60 companies with supported plan to invest, trade or provide services

4.1 Outcomes achieved by BENEFIT programmes

ISSD – Enhanced performance of the seed value chain

Over 175 linkages between seed producers and inputs, services and markets were facilitated in 2019. The Seed Information Exchange, a digital platform for sharing information on seed availability, has been expanded in its piloting to incorporate all four PSEs in the country with the strong encouragement of the State Minister for Agricultural Input and Output Marketing. A programme for a SeedNL mission of Dutch delegates from the ministries of Foreign Affairs and of Agriculture and breeding companies East-West Seed and Limagrain-Hazera to Ethiopia was organized including high-level dialogue on constraints to foreign direct investment in the country among members of the Ethio-NL Seed Committee, which was chaired by the State Minister of Agricultural Development and Policy.

The long-awaited directive on unregistered varieties, a directive ISSD has advocated, will increase foreign direct investment and foreign currency reserves in the country, was finally approved and two joint ventures with Enza Zaden and Rijk Zwaan have started. Lastly, innovations in seed value chains addressing bottlenecks in seed sector governance, early generation seed (EGS) supply, seed quality assurance and seed marketing were scaled in 2019. We observed several examples of increased public expenditure in the seed sector, including the recent establishment of the Oromia Agricultural Input Regulatory Authority, which brings the total number of independent seed regulatory authorities in the country to three; construction of new seed laboratories and upgrades to existing ones; and investment in seed marketing infrastructure.



One of the biggest challenges in raising the performance of the seed sector in Ethiopia is the current short supply of quality early generation seed of preferred varieties. Due to an unclear task division between research, government and seed producers, and the unclarity of actual quantity and variety for which early generation seed is demanded, supply has been inadequate. Seed units have been set up and are responsible for forecasting the early generation seed and translating it into production plans. Contractual agreements have been signed early generation seed and certified seed producers.

ENTAG

In the reporting year, the ENTAG programme worked on a range of activities on backward and forward market linkages, trade and investment integration among local and foreign agribusiness companies:

- **Market Linkage** – Following the legumes trade mission to India in 2018, close to 500 t of pulses has been exported to India in 2019. Demand has been much more than this number but has not been met due to lack of price and quality competitiveness. Ethiopian poultry commercial farmers have been linked to Dutch technology suppliers for farm supplies and inputs such as cages, feed mills, hatcheries, day old chicks etc. Market linkages among several local business companies were also facilitated; these include feed producers with livestock farms, poultry producers with input importers, and legumes farmers with input suppliers;
- **Trade missions** – A poultry training and trade mission has been successfully organized to Rwanda, Kigali. The mission that aimed at emerging poultry farms in Ethiopia took eight Ethiopian delegates to Rwanda to take part in a regional event that hosted a total of 43 poultry entrepreneurs from seven African countries. One incoming trade mission was also organized, whereby three Dutch companies came to Ethiopia to explore business potential on feed ingredients with Ethiopian counterparts;
- **Technical support and Front-desk services** - ENTAG has been supporting the private sector in Ethiopia on farm management, production quality, launching new businesses, investment opportunities, innovation fund grants, and challenges to improve their production. In this reporting year, ENTAG supported more than 108 private companies from spices, aquaculture and poultry sectors, on access to improved markets, investment opportunities and trade through its front desk, hands on advisory services and provision of graduate interns. Eight different poultry companies ranging from medium to commercial scale have been given technical support on new poultry farm establishment, poultry disease and feed management, and bio security. Besides, NGOs have also visited ENTAG front desk seeking information regarding challenges in poultry sector and the way forward in supporting the sector to identify intervention areas for development. Front desk request for spices mainly revolved around international market criteria, market linkage and sourcing options whereas for aquaculture it revolved around investment areas, potential and business start-up advice to the most part;
- **The major causes of ginger diseases** (*Phylostica*, *Fusarium* wilt and *Colletotrichum*) and possible integrated disease management technologies (Matico, Mancozeb and rape seed extract) were identified after a pilot project implemented at Areka, Tepi and Addis Ababa University, where the experimentation by the former two was under field condition and the latter one in a green house.

Awareness on ginger disease management along with field evaluation of the possible management technologies was done at Areka, where more than 122 participants from media, private sectors, government organisations, NGOs and smallholder farmers attended along with panel discussion on scaling up and out of the technologies. This is expected to boost domestic production, which was almost nil due to the disease incidence;

- **Platform meetings:** The programme organized eight platform meetings that initiated discussion on pertinent challenges and opportunities in relation to improving quality, access to finance, private sector role in the sector and public-private coordination. These platform meetings also highlighted nutrition and food quality issues in the Ethiopian poultry, aquaculture, and spices sectors. Aside from this, the meetings were a great tool to network and to create business-to-business linkages;
- **Innovation fund** - Two ENTAG Innovation Fund grantees have completed project implementation. The first innovation fund project is packing national food varieties (semi-processed and fully processed) with a food-grade packing material & labelling has been successfully implemented in 2019. The project helps supply national foods to local supermarkets and export markets without losing the original taste. The second project is an innovative and patented product called Calcium Supplement for livestock, which improves and maximizes the efficacy of animal feed and health, and productivity of poultry and livestock. The product is produced hygienically with minimal human contact and packed with quality packing material. Both innovations are proven approaches that can be scaled up and contribute towards increasing the quality of products supplied for human and animal consumption;
- **Business Opportunity Report** - ENTAG has been updating business opportunity reports on poultry, spices & herbs sectors. The updated business opportunity reports provide up to date information on the current status of the sectors in Ethiopia and serve as a tool for private investors, government and any other interested body to make informed decisions for tailored interventions;
- **Context Sensitive Investment:** following the recent attacks on foreign investments, 11 social impact assessments reports and guideline documents were prepared as ENTAG's intervention on context sensitive investment and shared with Dutch companies and clusters to modify their corporate social responsibility activities and engagements with the local community. The information of contest sensitive investment has also been disseminated to 188 foreign investments (65 Dutch and 123 other);
- **Foreign Investment:** ENTAG has taken up a new project delegated by the Netherlands Embassy to support the integrated development following four Foreign (2 Dutch, 1 German & 1 Belgian) investments in Kunzila, Amhara region. ENTAG in 2019 has coordinated two steering committee meetings in Bahir Dar with the Amhara investment commission, the companies and supporting development organizations. The programme has also mapped relevant stakeholders that would be valuable in the implementation of the sustainable development plan;
- **Capacity Building:** Skills and awareness of private companies, commercial farmers and cooperatives and Unions have been improved through exposure visits of new technologies and training programmes. Among these are:
 - A manual has been drafted to address Fish Products Handling and Quality Control (Simple Guide for Fishers, Fish Farmers, and Traders). It aims at improving existing low level of fish products quality at landing sites and markets. One training session was organized on aquaculture management for members of youth groups working on fish farming. Eight trainees and one intern received the theoretical and practical training at Ziway and Debre-Zeit areas;
 - Two capacity building trainings have been successfully held, where poultry professionals from key commercial farms have been equipped with the tools and practices for managing their poultry farm to increase production. These are:
 - Poultry feed production and poultry feed formulation training in collaboration with one of the Dutch African Poultry Partner, Aeres University of applied science. The training was aimed at capacity building of 18 poultry farms /feed mill managers from the major commercial farms in the country;
 - In collaboration with PAS Reform, which is one of the leading hatchery technology supplier from the Netherlands, hatchery management training to 20 hatchery managers in Ethiopia, has also been conducted.

To support the transformation of the Ethiopian spices sector, a business network has been established, market links with international buyers were brokered, and capacity building of Ethiopian farmers in Vietnam was facilitated. The trust developed between key stakeholders such as Ethiopian Coffee, Tea and Spices Agency, Ethiopian exporters, commercial investors, traders, development agents, model farmers, cooperative and union leaders was pivotal in strengthening the sector. However, contract defaults need ongoing attention.



SBN - Product and market development

The risk-sharing scheme for promoting marketing credit to cooperatives has a strong proof of concept: 100% repayment rate, increased trust and collaboration between farmers' organisations and financial institutions, better relations between farmers, cooperatives and unions and very encouraging signs of sustainability. Pre-harvest loans from cooperatives to members facilitated the financing of the last stages of the production season. On the basis of this proof of concept, the risk-sharing support scheme for cooperative marketing credit can be scaled. For years, the highly inflated Ethiopian commodity exchange (ECX) prices have made it practically impossible to post-harvest value creation and to develop relations among value chain operators. Because of the recent policy that prohibits buying beyond the international sesame price, this may change in the near future. With realistic domestic prices and accompanying measures for creating a level playing field, direct relations between international buyers and supplying farmers' organisations could be established. This would allow for aligning Ethiopian sesame to different promising market segments. There are good perspectives for product and market development for rotation crops. With market system change, the preparatory studies, trainings and business ideas could materialize for the purpose of product and market development, for sesame and rotation crops.



SBN has supported many initiatives to increase in country value chain development, but many did not lead to results. An analysis revealed that essential factors inhibiting product and market development include that high raw sesame prices make that farmers are not rewarded for investing in value addition; incentives for direct supplier-buyer relations are lacking, sesame is an expensive input for local processors and an enabling business environment is missing. Aligning ECX prices with the international market price would offer opportunities to create feasible post-harvest value adding activities. Additional fundamental changes would be needed.

5 Improved enabling environment for the agricultural sector



As a programme that targets demonstration of evidences for wider development, different interventions for improving the enabling environment have implemented by the different the BENEFIT partnership programmes and the BENEFIT portfolio. These interventions covered a range of activities including: (i) identification of relevant policy issues for further discussions based on prevailing challenges and opportunities, (ii) documentation of demonstrated evidences for the identified priority issues, (iii) engagement with relevant stakeholders to ensure the communication of demonstrated evidences through different forums mainly workshops, and (iv) contribution & facilitation of the design of new directives and regulations.



Contributed to 25 substantial policy changes/ reforms

5.1 Outcomes achieved by BENEFIT and its programmes

ISSD – Improved enabling environment for enhanced performance of seed value chains

ISSD facilitated a consultative process that led to the publication of the strategic document 'Transforming the Ethiopian Seed Sector: Issues and Strategies'. The document (henceforth referred to as the transformation agenda) is a stakeholder-owned and MoA endorsed strategic agenda for the seed sector. Twenty-four MoA staff members have been sensitized about the document and informed by the State Ministers to incorporate its strategies in their new multi-annual plan. ISSD chaired the panel finalizing the draft national seed policy; has prepared amendments to the 2013 Seed Proclamation; contributed in the development of the draft Plant Breeders' Right Regulation; and is an active participant in the National Seed Advisory Group. ISSD collaborated in the Netherlands

Enterprise Agency (RVO)-funded Institutional Mapping and Capacity Needs Assessment of Ethiopia's Public Seed Sector Services, and takes the study's recommendations on board. In 2017, the programme was handed the mandate by MoA to systematize EGS supply in the country and organized a series of meetings in 2019 to monitor and evaluate the progress made to date. New plans for EGS production and marketing in 2019/20 have been developed and contractual agreements signed. The Ethiopian seed association (ESA) was backed in their advocacy to address identified policy constraints to private seed sector development in the new draft seed policy.

After years of investment in piloting innovation and facilitating dialogue, ISSD Ethiopia has generated good rapport to pursue sector wide and inclusive strategy involving institutional and regulatory reform. In 2017, the National Seed Advisory Group was established to advise MoA on strategy and policy. In 2020, there exists a stakeholder-owned and MoA-endorsed seed sector Transformation Agenda, a draft seed policy and proposed amendment to the seed law. Key elements in guiding successful seed sector transformation have been: (i) embracing systemic change; (ii) manage adaptively and inclusively; (iii) investing in social capital.



CASCAPE - Strengthened enabling institutional environment for the agricultural sector

A wide range of workshops, and institutional advisory meetings have allowed key research and extension stakeholders to be continuously informed of the successful experiences gained and best practices generated by CASCAPE. High-level policy debate accompanied by policy briefs and technical notes are actively shared with policy makers including members of parliament, heads of extension programmes at MoA and the Bureau of Agriculture (BoA), Regional Agricultural Research Institutes (RARIs) and EIAR. For research and academia, who are important players in the policy formulation, scientific papers have been published and shared. One example of such papers that made sound impact on agricultural policy is the paper on "Explaining wheat yields" paper as result of which the MoA decides to stop importing wheat by 2023 by adopting site-specific blend fertilizer application in the 1.7 million ha of farmland conducive for wheat production in the highlands coupled with irrigated wheat production. Media attention was attained through documentary videos, press releases, media briefs and news channels allowed the dissemination of and increased awareness on BFP.



CASCAPE has generated 26 best-fit practices with accompanying extension materials. Seven have been included in the national extension system. They help to achieve significant higher crops yields across different locations and agro-ecological zones. This contributes towards national and regional food self-sufficiency in Ethiopia. It is estimated that if all wheat farmers would adopt the CASCAPE validated best-fit practices and obtain the same yields as the pre-extension demonstration field, the total wheat production would equal the national consumption and wheat import would no longer be needed. This would save over 56 million USD foreign currency annually.

ENTAG

The ENTAG program, through its platform meetings and other high-level engagements, has been serving as a catalyst for some of the national and regional policy, strategy and institutional reforms and draft of new regulations on Ethiopian poultry, spices, aquaculture and pulses subsectors. In light of this, ENTAG has been working on the below areas in 2019:

- An incentive package for investors in aquaculture and fisheries sector is under development by the MoA and Ministry of Finance. The package is expected to motivate entrepreneurs and investors to do business in the sector. ENTAG has collected inputs for this package on its platform and submitted to MoA;
- Catalysed the drafting of the poultry marketing legal framework through ENTAG poultry platform meeting;
- A go ahead has been officially granted by the Ethiopian Veterinary Drug and Feed Administration and Control Authority (VDFACA) to export poultry feed to other countries outside Ethiopia. This will support feed companies to attain self-generated foreign currency reserves to import essential inputs;
- The first draft proposal for establishing Ethiopian Pulse Council, a public-private partnership entity, has now been developed and endorsed by the ministry of agriculture; a formal launching of the Ethiopian Pulse Council is expected in the first quarter of 2020.

Pulses are important food and cash crops in Ethiopia. The sector however has its problems. In 2017 the first attempt to establish a council was strongly objected by Ethiopian Pulses Oilseed and Spices Processors and Exporters Association. In June 2019, representatives of the ministry presented the idea of Pulse Council and formal agreement was reached among key stakeholders that the idea should go forward with a leadership of the ministry. A major task ahead is to formally establish the council as an independent organization with active private-public sector participation and making it one that steers transformation of the Ethiopian pulse sector.



SBN – Strengthened enabling environment for the Ethiopian sesame sector

Much progress was made in 2019 in the areas of information management and stakeholder capacity development. A digital information system was adapted for the sesame sector and is ready to be shown with the data for four *kebeles*. Additional training materials (soya, mung bean and cotton field guides and sesame pest, disease and pest control guide) were prepared and printed. Capacity of farmers, women, youth, and experts was built on a broad range of subjects. The reach of trainings is beyond initially set targets, as a result of a larger intervention area and good collaboration with a range of partners. Efforts are made to make trainings more interactive. The application of the *kebele* agro-economic planning tool extended to 50 *kebeles* and has increased buy-in from regional stakeholders. The preparation and sharing of several lessons learned, experience papers and issue briefs on strategic issues is an important achievement for the SBN programme in 2019. This will be continued in the first semester of 2020. The papers and briefs have been input for strategic stakeholder meetings. Both at regional and national level there are improved perspectives for institutionalized regional and national platforms, based on collaboration with MoA, BoA, RARI's, the agriculture transformation agency (ATA) and other stakeholders.



The yield gap in sesame production is still large. The most important limiting factors for farmers' adoption of good agricultural practices are limited access to quality seed and inputs, row planters and to input credit. Addressing these bottlenecks require coordinated action of different stakeholders. For this purpose, SBN developed a practical tool for kebele agro-economic planning. Kebele teams with kebele staff, farmers and cooperatives and local financial institutions work on the profiling, assessment, and planning. The tool helps to identify agro-input and agricultural credit needs and gaps.

REALISE - System innovation pathway

- About 400 farmers participated (47% females) in pilot interventions being undertaken to address systematic bottlenecks. Farmers are complaining about high cost of inorganic fertilizers in general in the country and in particular in PSNP areas where agricultural potential is low. The REALISE programme introduced the 1,000 Birr package approach where farmers use half the recommended amount of inorganic fertilizers with the equivalent of 4t of farm generated compost per ha. There is also micro-dosing pilot trial where rate of fertilizer application is dramatically reduced because of better fertilizer placement closer to the plant;
- Pilots on poultry and small ruminants (sheep and goat) are underway to contribute to increased resilience of farmers and in other cases for off-farm income generation for youth;
- In-depth studies on future scenarios of Ethiopian agriculture under increasing population pressure, youth unemployment and integrated nutrition approach are underway;
- About 7,500 farmers participated (30% females) in farmers field days and shared experiences about improved agricultural practices used by farmers participating in the REALISE programme; and
- 541 research and extension staff (about 16% female experts) have been trained on different topics as a part of capacity building on matching, adapting, validating and scaling best fit practices.

6 Mainstreaming social inclusion and nutrition



6.1 Social inclusion

The establishment of gender and nutrition groups have strengthened and institutionalized the current efforts of the programmes to mainstream gender and nutrition in their project activities. The collaborative efforts were instrumental to build the knowledge base on gender, women and youth in different sectors.

Looking at collaborative efforts, ISSD and SBN worked together on enhancing sesame and rotational crop productivity and market linkage where almost 50% women participated in PVS and CS training and trails. The trials aimed at increasing the variety portfolio of sesame, soya bean and sorghum. During field days, women actively participated in evaluation of varieties and employed selection criteria which is often overlooked by male farmers. The soya bean processing activity that was implemented by CASCAPE, ISSD and ENTAG targeted almost 100% women as key beneficiaries. CASCAPE and REALISE worked with youth groups on papaya production and marketing where women participation was 50%.

ISSD and REALISE jointly trained 100 farmers including 50 women in marginal areas on quality seed potato production. In addition, based on the results of a gender gap analysis survey conducted by CASCAPE and ISSD, CASCAPE gave ToT on gender sensitive agriculture for 39 potato seed produces, 13 *woreda* officials and 4 zonal officials. ISSD assessed and documented gendered task division and dynamics in the potato value chains of Amhara and Oromia in collaboration with CASCAPE and REALISE, respectively. By scaling crowdsourcing to new areas, REALISE and ISSD have a better understanding of women's preferred crops, varieties and traits.

ISSD's pluralistic approach to increase the availability and use of quality seed of new, improved and/or farmer preferred varieties considers different groups in society including women, men, and youth;

farmers with small-, medium- and large-holds of land. Participation of women in the programme in general reached 35% in 2019, which is more than double that of 2016. To improve women's participation in local seed business, the programme provided training on gender awareness raising and advocacy to seed value chain actors, and facilitated amendment of cooperative bylaw to encourage increased women's equity in the business in general and participation at management level in particular. Another way in which ISSD mainstreams gender is that it gives a balanced representation of men and women in the demonstrations it organizes and news items it publishes.

In 2019, inclusion of different stakeholders in seed value chain interventions has been achieved foremost through the mixed composition of the regional seed core groups. The programme sensitized its investment decisions on gender by starting recording the impact of its investments from 2016 onwards and evaluate the programme impact on numerous areas of outcome, including social inclusion and nutrition. The overall female participation of CASCAPE in 2019 was 28% in general and 82% specific for nutrition sensitive agriculture.

In 2019, CASCAPE social inclusion efforts focused on disseminating labour saving technologies and no-harm effect best-fit practices. In order to ease the heavy workload on women and children, the programme introduced improved stoves and solar panels; potato harvesters; Enset scraper; bags to speed up fermenting of Enset, milk churner; maize sheller, and water fetching pulley. In the testing and validation activities, the practice has to pass no-harm effect on women to be qualified as best-fit practice. The validation protocol also integrated gender and nutrition dimensions as criteria for evaluation of technologies in screening process.

Under its Inclusive Business Model, ENTAG has been providing support to a company working with 300 smallholder women producing and processing spices & herbs. This pilot project has been picked up by another development organization as a best practice and the approach has been scaled up to 5,000 smallholder women in the same area, partnering with the same company.

Inclusion of women and the youth was given due attention during planning and implementation of sub-sector activities. Different activities in the aquaculture value chain engaged the youth and women more than other segments of the community. In addition, 106 new graduates, of which 70 male and 36 women, were placed to agribusiness companies as part of ENTAG's Internship program.

In SBN, proactive actions were taken to ensure social inclusion (gender, youth and labour) on significantly higher level in training, technology scaling and during field days. For trainings on good agricultural practices, separate sessions were organized for women and youth. Training on gender mainstreaming, sensitivity and inclusion was provided to SBN agronomists and researchers from GARC, who in turn trained *woreda* experts. Gender awareness and mainstreaming training was provided to 32 SPC member farmers (4 women) and development agents.

Soya and mung beans are being promoted by SBN as rotation crops for sesame in the lowlands of Northwest Ethiopia. Many women are interested in cultivating soya and mung beans as a cash crop. They are easy to grow and have less labour requirements. To promote uptake of these rotation crops in local consumption patterns, recipes using soya and mung bean were developed and shared, mainly with women, during practical training sessions. Mung bean is becoming more important as a nutritious food to farmers and day labourers.



A higher level of women participation was observed in SBN home gardening and financial literacy training. The interventions on access to finance continue to increasingly benefit women; 28% of the more than 5,000 farmers benefiting from on lending of marketing credit were women. This is

encouraging as it is inline or even beyond the proportion of female membership of the participating cooperatives.

Despite their importance for sesame production and their share in production costs, labourers are often overlooked. In 2019, over 3,300 farmers participated in labour sensitisation events, where information is given on labourers' and investors rights and responsibilities, labour and living conditions, health and security. Labourers were also informed about improved production practices. Brochures on the labour proclamation and on labourers' living and working conditions were distributed. Short movies on the same subjects were shown using mobile cinema.

REALISE mainstreaming of social inclusion received attention during staff recruitment, training, PRA activity planning, implementation and monitoring and baseline surveys. In 2019, a total of 22,445 farmers were directly reached by the programme out of which 9,636 (43%) were women and 4,069 (18%) were youth. From the 112,107 indirect beneficiaries reached this year, 45% were women. In addition, a total of 70 women benefited from Enset processing technology to minimize the time and labour of women.

The in-depth studies and research pilots mainly deal with systemic bottlenecks and issues of social exclusion, which among others focus on youth, gender and economically weak section of the community. Most of the pilot interventions designed to ensure social inclusion of the marginalized section of the community. In the total of 13 pilot activities implemented or started in 2019, 441 participants were reached out of which 59% and 47% were women and youths resp. REALISE bring forward youth unemployment, gender and food insecure households causes into its programme operation. The programme demonstrated that if appropriate interventions are designed and institutional support provided women and youths, the poor and vulnerable groups can actively participate in development activities and share from equitable distribution of benefit.



Youth unemployment is a major challenge in Ethiopia. REALISE piloted small-scale commercial poultry production as an employment creation activity for rural youth. Sixteen young men and women were organized in a group, trained and provided with 800 chicken, chicken feed, and chicken house construction materials on a credit basis. Group members save with the Rural Saving and Credit Cooperative to repay the credit. This is then reused to finance another youth group to engage in income generating activities. The results are promising: each group member can potentially earn 80 dollars per month.

6.2 Nutrition

One of the activities under the 'Sesame value chain development and rotational crops seed production and business' was a collaborative effort among SBN, CASCAPE and ISSD that focused on providing a training on production packages for mung bean, where farmers and experts learned about the economic and nutritional importance of mung bean.

SBN in collaboration with ISSD provided awareness creation training on nutrition for 32 SPC farmers and development agents. The programmes gave due emphasis and awareness creation to seed producers to promote increased production and marketing of nutritious dense crops and seedlings such as grain legumes, fruits and of omega three rich crops like sesame. In addition, the collaborative effort between ISSD, CASCAPE and ENTAG on promoting soya production and marketing was to ensure household level nutrition.

During the first regional gender and nutrition working group meeting SBN, CASACAPE, ISSD and REALISE shared their experiences in improving the nutrition security of rural households in Ethiopia.

Fundamental to ISSD's strategy is to mainstream nutrition by diversifying crop and variety portfolio for which quality seed is available. In 2019, specific attention was given to include nutrient dense crops in our variety deployment efforts. By facilitating Dutch/international breeding companies trade with and investment in Ethiopia, we have created opportunities to broaden the grain, vegetables, fruits, forage variety portfolio for which quality seed was offered.

About 769 women farmers accessed quality seed of important leguminous crops for their household including chickpea; common bean; faba bean; field pea; and lentil; 110 farmers (70% women), participated in food fairs and nutrition education; and 5,500 farmers participated in nutrition awareness creation and field days in Oromia (south & west).

In 2019, CASCAPE nutrition activities focused on home gardening, food exhibition, field days, nutrition and behavioural change communication training. The overall rate of female participation in all nutrition-sensitive agriculture activities was 62%. The capacity building training for experts and researchers targeted both women and men with female participation of 16%.

In the reporting year alone, 337 home gardens were established that included seven different types of vegetables and some fruit trees (avocados, mangoes) to bridge the nutrition gap. Other activities included pulse-based food preparation and food exhibition, food recipe training, and food fair exhibition. The field level crop-based nutrition activities included demonstration of chickpea, soya bean, faba bean and mung bean that are protein rich crops and are source of cash income.

In collaboration with CANAG women were trained on establishment and management of the vegetable gardens. ToTs were organized for DAs to train women on seed bed preparation, vegetable production, consumption and preservation. Regarding CASCAPE Nutrition and Gender project's (CANAG) effort on nutrition education and behavioural change, initiated to understand intra-household food distribution and gender dynamics, diet diversity score (DDS) assessment materials were purchased and wet season data was collected, analysed and the reported. The programme also developed a policy brief on 'Enhancing Soya bean value chain to bring nutrition security and environmental sustainability' and shared this with relevant stakeholders.

ENTAG run platforms with MoA and the value chain actors to come up with strategies of increasing consumption of fish and poultry within the daily diets of the communities. The programme organized eight platform meetings that highlighted nutrition and food quality issues in the Ethiopian poultry, aquaculture, and spices sectors. The meetings were a great tool to discussion on pertinent challenges and opportunities in relation to improving quality, access to finance, private sector role in the sector and public-private coordination and network and create business-to-business linkages.

SBN promoted nutrition through integrated farming systems (rotation crops, home gardens, horticulture, crop-livestock integration). To contribute to dietary diversity and farmer income improvement SBN promotion of home garden continued in 7 *woredas*. The home garden pilot stimulated the production of diversified and nutritious food, such as leafy vegetables, okra, onion, tomato, papaya, mango, citrus and others. The products were mainly used for home consumption and contributed to a more diverse diet.

Building further on the 2018 experiences and results, a training that focused on home garden set-up, production techniques of different vegetables and fruits, water management, pest and disease control, post-harvest handling and health and nutrition benefits of fruits and vegetables, was scaled to five *woredas*, reaching 218 farmers (45% female). The trainings also covered topics on seed production, importance of nutrition, food groups, causes and consequences of poor nutrition. The training sessions were organized in collaboration with HuARC and Gondar Agricultural Research Centre (GARC) and the respective *woreda* office of agriculture (WOA). The experiences of farmers using home garden products as nutritious food were documented and shared.

To address challenges related to labourers that are essential for sesame production but live and work under poor conditions and have a very monotone diet, the programme organized awareness creation events on labour rights and responsibilities, health and nutrition for more than 3,300 labourers.

One of REALISE's key performance indicators is to increase the DDS of its target households over project period. Therefore, in its nutrition interventions the programme gave special attention to women due to their nutritional requirements as well as their socio-economic and cultural vulnerabilities to food shortages. Out of 3,919 farm households who benefited from nutrition sensitive agriculture interventions 50% were women farmers and 17% were youth.

REALISE nutrition sensitive agriculture interventions include demonstration of legumes (faba bean, field pea, haricot bean, mung bean, orange fleshed sweet potato, quality protein maize, papaya and vegetables among others); diversified home gardening using at least four (4) vegetable varieties; bio-fortified crops (haricot bean, orange fleshed sweet potato) and improved varieties of Irish potato and sweet potato. With regard to fruits, a total of 1,896 (40% women) farmers received papaya seeds and seedlings. Among these farmers, 376 (19.8%) were youth, out of which 46% were female youth. In addition to papaya, other fruits such as avocado, mango and banana were also demonstrated. The small ruminant and poultry related resilience pilots demonstrated that small ruminant introduction with full package can improve the resilience of poor households and contributed to asset holding, improved nutrition and income.

In relation to capacity building experts from the *woreda* office of agriculture, development agents, extension workers and researchers were trained on seed production and nutrition sensitive agriculture.

In 2019, the programme also initiated two in-depth studies 'Integrated nutrition development for resilience building' and 'Assessment of key Barrier and Bottlenecks to Improve Nutritional Status of Mother and Children' to generate evidences and adequate insights to systemic challenges to imitate dialogues with policy makers in 2020.

7 Major challenges, opportunities, lessons learnt and way forward



7.1 Major challenges

The different BENEFIT programmes have been engaged in addressing the identified key challenges faced in the implementation processes. While it has been possible to address some of the challenges some of the challenges persisted and new challenges emerged:

- **The planned organizational restructuring within the MoA:** the limited clarity in the outcome of the on-going restructuring has influenced the different programmes to fully engage with relevant directorates and sections within the ministry for adequate embedding of demonstrated evidences;
- **Staff turnover including higher officials at all levels (federal, regional, zonal and woreda levels) in public and development partner organizations:** this has persisted resulting in limited timely implementation of planned activities esp. those related with policy engagements and in smooth mainstreaming of partnership for synergy;
- **Limited implementation capacity within the MoA esp. in the area of policy, regulation and directives:** most of the approved directives and regulations are still to be implemented mainly linked with the limited implementation capacity. This demands active unplanned engagement in facilitation process at all levels;
- **Weak linkage with the national research systems and technology suppliers:** this has continued as key challenge in spite of the planned activities to address the problem. This has created limited access to required type, volume and number of technologies for testing, validation and/or scaling activities;
- **The moderate embedment of demonstrated evidences of BENEFIT Partnership:** this has remained as a challenge as some of the demonstrated evidences (validated technologies, financial literacy, policy options etc) by the different BENEFIT partnership programmes still require further engagement with relevant stakeholders to ensure their full adoption and sustainable utilization;
- **The short period of implementation for demonstrating more influential evidences:** this is the main challenge for the REALISE programme, which has only one production season making it

challenging for demonstrating adequate evidences esp. related to issues relevant for policy for food insecure areas;

- **Low sensitivity of partners towards gender and nutrition:** there was a challenge to adequately ensure the mainstreaming of gender and nutrition related evidences due to the low interest and sensitivity at different levels;
- **Prevailing climate challenges:** the challenge persisted also in 2019 production in the form of unpredictable weather condition(drought, floods, frost), pest and disease incidence, especially for implemented activities related with testing and validation;
- **Programme staff turnover:** the staff turnover in some of the implementing partner organizations has demanded additional efforts from national staff creating compromises in timely implementation of some of the planned activities.

7.2 Opportunities

The main opportunities in 2019 were related with (i) endorsement of some of the strategic documents, (ii) increased interest of existing and emerging new initiatives to collaborate, (iii) engagement with the Rural Economic Development & Food Security committee (RED&FS) is creating an opportunity to communicate BENEFIT results, (iv) the increased visibility and continued recognition of the BENEFIT Partnership by stakeholders including policy makers.

- **The endorsement of some of the strategic documents** like the National Seed Transformation Agenda and Mandate Zonation for members of the national agricultural research system (NARS) is creating an opportunities for quicker adoption of demonstrated evidences;
- **Increased interest of existing and emerging new initiatives to collaborate:** this has continued in 2019, where there is increased interested to adapt BENEFIT demonstrated evidences in some of the initiatives like the agricultural commercialization clusters (ACCs), integrated agro-industrial park (IAIPs). Similarly, there is high interest of other initiatives in collaborating on scaling BENEFIT demonstrated evidence by ATA, AGP, PSNP etc. This is a very good opportunity for synergy in scaling;
- **Engagement with RED&FS is creating an opportunity to communicate demonstrated evidences:** Currently, the BENEFIT Partnership is serving as the co-chair of the Agricultural Input and Output Marketing Development technical committee, as a member of Agricultural System Transformation technical committee, the Policy and Governance taskforce, the Extension and Capacity Building taskforce, and the Agricultural Research and Technology taskforce;
- **Increased visibility and recognition to BENEFIT Partnership:** This has facilitated continuous engagement with relevant stakeholders including policy makers, which is important for increased influence and wider impact of the BENEFIT partnership efforts. Senior staff of BENEFIT partnership are invited to many different engagements and taskforces.

7.3 Key lessons learnt and the way forward

The general key lessons learnt and the way forward for BENEFIT and its programmes were:

- Creating partnership for synergy demands adequate flexibility and follow up. Working in partnership with other initiatives eases the mainstreaming of evidences and engagement with policy makers. Accordingly, strengthening and mainstreaming of alignment will continue;
- The embedding of senior experts of the BENEFIT partnership, on seed systems, extension and sesame, in the MoA contributes to the uptake of BENEFIT generated policy advice;
- Mainstreaming of gender and nutrition evidences requires working with existing networks like with National Gender Equality Network. This facilitates sharing of experiences and possible mainstreaming;
- Consideration of the specificity in terms of agro-ecology and socioeconomic aspects of target beneficiaries for demonstrating evidences played important role;
- Linked with the priority given to embedding and institutionalization of evidences and innovations demonstrated over the last four years of implementation of the different programmes of BENEFIT,

we will continue ensuring partnership of synergy in the effort for sustainability of demonstrated evidences;

- Implementation capacity of the public sector is a key factor for successful mainstreaming of evidences in policy and development processes;
- Documentation of demonstrated evidences as a tool for engagement with policy makers and development practitioners continues to be very crucial. Accordingly, due attention will be given to document the demonstrated evidences of BENEFIT programmes in 2020.

8 Enhanced partnership for synergy



Coordination of the partnership for synergy among BENEFIT programmes and with other development programmes has been implemented by the BENEFIT Partnership Coordination Unit (PCU) mainly through facilitation of:

- Alignment of programmes and their collaboration;
- Collaboration and alignment with other projects and programmes;
- Facilitation of policy engagement;
- Mainstreaming social inclusion and nutrition, and
- Fostering collaboration in BENEFIT portfolio in terms of (i) BENEFIT portfolio management; (ii) provision of centralized administrative services (finance, human resource management etc.) to the four BENEFIT programmes; and (iii) communication and use of evidence-based information through an effective M&E system linking the four BENEFIT programmes and other partners.

8.1 Alignment of programmes and collaboration

The facilitation of alignment and collaboration has continued in 2019 through organization of review and planning events, regular reporting, organization of peer-to-peer meetings, and engagement with EKN.

- **Collaborative activity review and plan development:** The PCU facilitated the development of collaborative activity plans for 2019 by organizing review and planning programmes. These workshops also facilitated the possibility of learning among clusters in ensuring better collaboration along with possible collaboration across regions.
- **Shared learning within BENEFIT:** Regular and timely dissemination of information regarding the BENEFIT Partnership and its programmes has continued to be facilitated by the PCU in coordination with the respective programmes in 2019. The PCU continued serving as a hub for liaising and communicating with external stakeholders for those issues that are not specific to respective programmes based on the BENEFIT communication strategy.

- **Engagement with the Embassy of the Kingdom of the Netherlands (EKN):** this has continued through meetings to updating progress and through invitation of relevant EKN staff in BENEFIT Partnership engagements with stakeholders including the different workshops and field days organized.
- **Regular reporting:** The preparation and submission of regular reports (quarterly finance and annual narrative and finance) was facilitated by the PCU. Programme level reports assisted in tracking progresses made against planned targets of the individual programmes and collaboration among programmes.

8.2 Collaboration and alignment with other projects and programmes

The PCU has facilitated the formal and informal collaboration with relevant public and private initiatives at both BENEFIT and programme levels to ensure effective alignment and synergy. Specifically, the key areas and organizations with which BENEFIT and its programmes continued to collaborate were:

- (i) The membership and active engagement in the newly restructured four technical committees of the RED&FS as BENEFIT has been instrumental to align and synergize efforts with relevant development partners. BENEFIT Partnership currently serves as co-chair for the agricultural input and output marketing development technical committee;
- (ii) The formal collaboration with ATA has enabled to jointly engage with relevant stakeholders in the areas of seed sector development, soil test based fertilizer application, sesame sector development, and also general agricultural market development;
- (iii) BENEFIT has continued collaborating with MoI in promoting investment in agro-industry parks, and
- (iv) The BENEFIT partnership has continued in engaging and facilitating the functioning of taskforces and technical committees like the National Seed Advisory Group, the Agricultural Development Partners Linkage Advisory Council (ADPLACs) at national and regional level.

8.3 Facilitation of policy engagement

The policy level engagements were facilitated in diverse areas through own facilitation and through participation in events organized by other partner organization. The following policy engagements were the most important ones:

- Coordination of a field visit of the state ministers H.E. Dr. Kabba Urgessa, State Minister for Natural Resources and Food Security and H.E. Mrs. Aynalem Nigusie, State Minister for Agricultural Input and Output Marketing Sector of the Ministry of Agriculture. The visit was attended by Mr Thijs Woudstra, Deputy Head of Mission and Dr Worku Tessema, Senior Policy Officer for Food Security & Sustainable Development of EKN in Ethiopia;
- The regular engagement as BENEFIT with the relevant sectors of the MoA through the monthly meetings specifically with the state minister for agricultural sector development and with the state minister for agricultural input and marketing development sector has played crucial role in communicating the demonstrated evidences for mainstreaming and consideration in policy processes;
- Participation at a policy dialogue institutionalization of ICT for agricultural extension in Ethiopia, where the current status and potential of ICT solutions that can be considered were presented and discussed;
- Organized subsequent seminars at the extension directorate of the MoA on the importance of Mandate Zonation for Members of the NARS and Institutionalization of Agricultural Technology Testing and Validation for Wider Adoption, which is adopted for piloting in 2020;
- Participation on the policy dialogue on the role of agricultural professionals in ensuring agricultural transformation in Ethiopia organized by the MoA;
- Participation of the policy discussion on piloting of the development of value chains for maize, sorghum, sesame, avocado, and coffee organized by the MoA, which allowed sharing of BENEFIT experiences;

- Participation on public dialogue on scaling climate-smart agriculture in Eastern Africa organized by NWO-WOTRO Food and Business Global Challenges Programme;
- Participation in a National Seminar on Agricultural Mechanization and Commercial Agriculture in Ethiopia organized jointly by MoA and the Japanese International Cooperation Agency;
- Participation in an international conference held in Nairobi entitled "Towards a Pan-African Transformation: Innovative Approaches to Evidence Uptake & Use in Africa", where more than about 100 practitioners, policy makers, academics, researchers, activists, funders and implementation scientists participated who are engaged in the generation and implementation of evidence-informed decision-making and practice in Africa. This has created the opportunity to share the experiences of BENEFIT Partnership in ensuring evidence uptake.

8.4 Mainstreaming social inclusion & nutrition

In 2019, the BENEFIT portfolio coordination unit (PCU) was mainly focusing on: (a) documentation and communication of gender and nutrition experiences and evidences of BENEFIT Programmes, (b) providing technical support and backstopping to BENEFIT programmes on nutrition and gender along with follow up and support the implementation of gender and nutrition collaborative activities, and (c) participation and sharing of experiences using the national level network meetings in the areas of gender and nutrition.

- a. **Documentation and communication of gender and nutrition experiences:** The experiences and evidences were documented in the form of case stories, briefing notes and the results of the documentations were communicated to BENEFIT-staff as well as at national level through stakeholders' workshops. End-line assessment of gender mainstreaming was conducted using gender audit tool to identify strengths as well as areas that needs to be strengthened in areas of gender along with comparative analysis between 2016 and 2019 gender audit results to identify the progresses and the results can serve as a source to advance gender equality in BENEFIT and similar programmes.
- b. **Technical support in Gender and Nutrition:** Technical support and backstopping on nutrition and gender was provided to all BENEFIT programmes on demand bases. Some of these are:
 - ToT provided on gender for CASCAPE Nutrition and Gender experts/focal persons;
 - Sensitization on gender equality strategy for agriculture sector in Ethiopia for REALISE gender and nutrition staff;
 - Facilitation of the sharing of CASCAPE validated home gardening manual to SBN staff;
 - Sharing of relevant gender and nutrition documents including (i) the updated version of Ethiopian Health and Demographic survey (2019), (ii) Integrating gender considerations in Ethiopia's National Adaptation Plan;
 - Provision of technical backstopping to all BENEFIT programmes during planning and implementation including development of checklists;
 - The revised ToR of the Gender and Nutrition working group was made available and shared with members of the working groups in each regions, which has an increased focus on monitoring gender and nutrition activities, collection and documentation of best practices.
- c. **National level networking:** BENEFIT actively participated in the national level network meetings in the areas of gender and nutrition and systematically reflected BENEFIT experiences and shared relevant information back to BENEFIT staff. This has helped in scaling of the gender and nutrition related innovations and evidences demonstrated by the different BENEFIT programmes.

8.5 Fostering collaboration in BENEFIT portfolio

8.5.1 BENEFIT portfolio management

The management meetings held in 2019 were BENEFIT Portfolio meetings, managers, and coordinators' meetings.

- **BENEFIT portfolio board meeting:** this was held in the presence of programme managers and coordinators targeting (i) a follow up discussion on directions made during the advisory board about priority issues for 2019 implementation, and (ii) preparatory activities for the no-cost extension phase. Accordingly, the portfolio board decided the activities to focus on institutional embedding of the demonstrated evidences with proactive engagement with policy makers and development actors considering the emerging opportunities. It was also decided to engage with EKN to explore the possibilities of future programme and framed the key framing of its content.
- **Management & coordination meetings:** Regular meetings were held with a focus on progress made in collaborative activities and to ensure the smooth implementation of planned activities and creation of synergy.

8.5.2 Monitoring and Evaluation

2019 being the final year of implementation of the portfolio, 2019 PCU M&E plan mainly focus on result harvesting and documentation of lesson learned at portfolio level and supporting on the same issue at programmes level. In general, the focus for 2019 implementation were result harvesting & documentation of lessons learned, facilitation of collaborative activities M&E and facilitating partnership level M&E.

The following are major activities and result achieved:

a. Facilitation of BENEFIT M&E framework implementation

- Indicator tracking: Indicator values for all programmes were tracked;
- Reporting: this covered (i) facilitation sharing of quarterly and bi-annual collaborative reports by regional collaboration leads, (ii) compilation and sharing of the compiled report for BENEFIT management team, and (iii) facilitation and compilation of BENEFIT level bi-annual report which was shared with BENEFIT management;
- Technical support for programmes in refining their M&E system (ENTAG, REALISE) and implementation of M&E tools as requested (REALISE). Active participation in REALISE M&E system establishment, like input provision for M&E documents and different M&E related consultative sessions. Similarly, with ENTAG team refining of their M&E system especially for 2019 and 2020 implementation year.

b. Facilitation of stimulation of learning culture

- As it has been known in the past few years, collaboration activity planning and reporting process has been implemented using a tool, which was inspired by capitalization Experience approach. This tool has contributed for better result focused planning and reporting. Therefore, it has been used as good template for collaborative activity reporting and planning. In addition, quarterly and bi-annual collaboration update was compiled and shared for management. In this year, joint monitoring could not be materialized because of security related issue in the country during the planned joint monitoring time;
- Producing BENEFIT lessons learned documentation guide and successful implementation of the familiarization sessions on lessons learned exercise with BENEFIT M&E experts and with REALISE regional teams;
- Successfully conducted lesson learned session with all BENEFIT gender and nutrition experts to guide documentation of BENEFIT gender and nutrition lessons, and
- Facilitation of the documentation and publication of lesson learned products. The final version of shared SBN lesson learned documents were published and other programmes are in the process of compiling their lessons for publication and sharing.

c. BENEFIT representation

- Representing BENEFIT in M&E related issues (with EKN, CTA, MoA both face to face and online);

-
- Lead participation of BENEFIT M&E experts in EKN organized IATI workshop and share the result of the meeting with the remaining M&E colleagues and with BENEFIT management.

8.5.3 Communication

The communication interventions in 2019-targeted facilitating internal and external communications towards promoting the activities of BENEFIT and its programmes, build consistent branding and share knowledge and information for effective management. The main achievements are:

a) External communication

The focus on the external communication was development of different communication products and ensuring access through:

- BENEFIT website: A total of 72 articles (news, events, announcements, and programme updates) were posted on BENEFIT website. The website design was also updated to reflect changes (e.g. changes in website links and logos). The changes and the increased number of postings have resulted in doubling the number of visitors per month (above 800). BENEFIT-REALISE website is now operational.
- Publications: together with respective programmes the following publications (developed, edited, formatting, process printing) were shared with relevant stakeholders at various meetings and through BENEFIT website:
 - A four page brochure that highlights BENEFIT 2018 annual achievements
 - Four BENEFIT Quarterly Newsletters
 - Transforming the Ethiopian Seed Sector guideline
 - BENEFIT-REALISE PRA Studies (8) BENEFIT-REALISE Baseline Survey (8)
 - Promoting Best Fit Practices in Crop Production and Pre-scaling: The CASE OF BENEFIT-REALISE Mekelle University Brief
 - Aflatoxin in Pulses: the case of BENEFIT-ENTAG contribution to the spice, herbs and pulses sectors in Ethiopia Brief
 - Gender Mainstreaming Contribution to Women's Empowerment in Informal Seed System Brief
 - Food Safety and Quality in Poultry Sector of Ethiopia, case of BENEFIT-ENTAG Brief
 - Lessons Learned in developing a complete, sustainable and inclusive sesame sector in Ethiopia: Sesame Business Network (SBN)
- Impact stories: The following impact stories were developed and shared with appropriate audience:
 - From substance to commercially oriented agriculture -Papaya production in Southern Zone of Tigray
 - The new face of wheat - unlocking the potential of wheat farmers in Omonada district, Southwestern Ethiopia
 - Investing on landless women ripping multiple benefits
 - Dairy goat provision in Raya Azebo
 - Taking potato from backyard gardens to small commercial farming in Eastern Zone of Tigray
 - Reviewed MSC videos to select clips to produce one BENEFIT MSC video
- Posters: three gender related posters were developed, :
 - Dairy goat intervention building the residence of rescue poor women - REALISE
 - Enset scraper - small investment big benefits
 - Use of polythene bags proven successful in Kocho fermentation

8.5.4 Finance and administration

With the centralized finance and administration system, appropriate support functions related with (i) financial management, (i) human resource management, (iii) procurement, and (iv) pooled resource use facilitation were provided in 2019. The overall achievements and challenges faced are presented for each of the functions below:

Financial management: As per the approved BENEFIT financial management guide put in place in 2016 and overall accounting system, all finance related activities were performed centrally for all BENEFIT partnership programmes. The activities include: (i) financial demand projection, (ii) facilitation of payments and preparation of associated financial documents including settlement,

(iii) regular financial reporting, (iv) contract management, (v) salary preparation and payment, (vi) audit facilitation, and (vii) financial monitoring, support and advice on financial management and compliance requirements of the partners for their fund transfer, as well as reporting requirements were provided.

In the process, the WUR has been backstopping in terms of (i) providing remote and direct advises, (ii) financial reporting, (iii) facilitating transfer of finance, (iv) financial settlement for partners that have direct contract with WUR, and (v) participation in the development and revision of BENEFIT financial guide.

Human resource management:

The human resource management at BENEFIT Partnership level was managed centrally, which is related to recruitment, documentation and personnel management. Follow up and adherence to hosting government rules and regulations and facilitation and support on visa processing of our partners from WUR and others.

Appendix 1 Lesson learnt

‘A drop of water creates a lake’: collateral-free credit for Koticha Kuyu Seed Producer Cooperative members in Oromia

Despite a rising number of members, growing area under seed production and accumulating volumes of seed produced, Koticha Kuyu Seed Producer Cooperative (SPC) faced significant challenges in generating the corresponding increased working capital needed to procure all this seed from its members. Neither members were willing to increase their share in the business by paying greater contributions nor financial institutes prepared to offer affordable financial credit to the cooperative. The members themselves were also too strapped of cash to consider providing their seed upfront against delayed payment and dividend from the SPC, having many household expenses to pay for. The success of the SPC in local seed business was at serious risk of failing.

It was at this point in time that ISSD Ethiopia and the Regional Cooperative Promotion Agency (RCPA) of Oromia analysed the situation and suggested that the members established a Rural Saving and Credit Cooperative (RuSACCo). Chairman at the time, Ato Mulugeta, explained the importance of the suggestion to the SPC’s members using the local proverb “cimmis mana guutte qunxur mana fixxe”, which translates “a drop of water creates a lake, while small leakage empties the lake”. In 2015, Koticha Kuyu SPC members established Gamachu RuSACCo and have managed to significantly reduce their financial constraints.

Koticha Kuyu SPC is located in Lokloka Abe *kebele* in West Shewa zone, approximately 70 km west of Addis Ababa on the highway to Ambo. The SPC was founded in 2013 by 41 members including four women with an initial capital of ETB 19,000. Today, the total number of members has reached 59, 12 of whom are women, and capital has more than doubled. The area under seed production in 2018 was 92.5 ha, which yielded an estimated 1,843 quintal of quality seed.

The suggestion by ISSD Ethiopia and Oromia RCPA to Koticha Kuyu SPC’s members to establish a RuSACCo was done with two outcomes in mind. The first was to mitigate members’ personal financial constraints through the provision of low interest rate and collateral-free loans and the second was to secure the timely procurement of seed through the provision of input vouchers.

Since 2015, Gamachu RuSACCo has lent ETB 166,700 (~ € 4,765) through 93 individual loans

to its members with an interest rate of 5% or less having been applied. It wasn’t until 2018 that the scheme really took off. In 2018, 46 SPC members borrowed ETB 131,900 for as low an interest rate as 1%, and current savings are up to ETB 230,000. Gamachu RuSACCo has enacted two forms of saving in its cooperative bylaw. The first is a mandatory saving of each member, which was increased last year from ETB 50 to ETB 100 per month. The second allows for voluntary monthly savings of whatever is affordable for members. Today, over a fifth of the cooperative’s members contribute ETB 200 more than the mandatory amount of ETB 100 per month.

What worked well

- Koticha Kuyu SPC benefited from its members’ participation in the Gamachu RuSACCO.
- Loans increased in frequency and size, whilst interest rates dropped to as little as 1%.
- Collaboration among Koticha Kuyu SPC, Oromia RCPA and ISSD Ethiopia resulted in solving the capital constraints of the SPC’s members and business as a whole.
- Whilst enacting bylaws that stipulate mandatory savings of members was important, voluntary savings resulted from the members’ belief in the value of the scheme.

What did not work well

- It took three years to generate the proof of concept needed to convince members to save and borrow larger volumes of money.
- The SPC has not developed the appetite to borrow greater sums of money from commercial banks or micro-finance institutes to grow the working capital of the business more significantly.

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Promotion of rotation crops in the sesame dominated production and market systems in the lowlands of Northwest Ethiopia

In the lowlands of north-west Ethiopia, farmers mainly depend on sesame and sorghum, respectively for cash and food. Together these two crops account for more than 90% of the cultivated land. This situation bears different risks: (i) mono-cropping leading to soil depletion and increased pest and disease infestation; (ii) farmers' dependency on single cash crop that has a volatile market and (iii) a monotonous diet (low diet diversity score) of resident population and seasonal labourers.

The promotion of rotation crops has three main objectives: sustainable agricultural production, farmer income improvement and diversification, food and nutrition security and diversity. Emphasis was put on the improvement of sorghum production and marketing, and especially on the introduction of soya and mung bean, as these can importantly contribute to soil fertility management and reduced incidence of pests and diseases. Pulses are furthermore providing proteins and have market potential.

What worked well

- The recommended practices for sorghum, mung bean and soya bean were developed and consolidated, in collaboration with GARC, HuARC and BoA.
- Three field guides for farmers were prepared and distributed (for sorghum in 2017, for mung and soya bean and for cotton in 2019). The promotion of rotation crops was part of the collaboration agreements with BoA and ARCs. This institutional collaboration helped to make the promotion of rotation crops a success.
- Between 2014 and 2018, rotation crops were demonstrated at farmer training centres (FTC's) and in farmer fields. Tens of thousands of farmers observed these plots and were triggered to consider growing them. Feedback of farmers was used to set priorities for scaling out rotation crops. Farmers have been supported to grow and market sorghum, soya and mung bean. Quality seed was made available for this purpose. Mung beans are particularly important in Tigray and soya bean production is developing very well in Amhara.
- Short-cycle mung bean varieties were demonstrated and scaled out, mainly in Tigray and in Belesa. These varieties are important in the context of climate change. When other commodities are not feasible, mung bean is still possible. Mung bean is becoming more

important as nutritious food to farmers and daily labourers. The adoption and expansion of soya bean is very encouraging in Amhara and has potential for providing food and oil processing companies.

- Recipes using soya and mung bean were developed and shared, mainly with women, during practical training sessions. As they are easier to grow and have less labour requirements, many women are interested in soya and mung beans, especially as crops for sale. As of recent, the Ethiopian Commodity Exchange (ECX) has included soya and mung bean in their marketing system, which may facilitate sales. Concerning sorghum, a malt sorghum variety (Deber) was tested on field performance, as well as on its suitability for brewing. Unions were supported to enter in contract agreement with Diageo for the delivery of malt sorghum to malting factories.



Challenges

- Both in terms of quantity and quality, the seed supply was not good enough. Currently, seed supply depends on research centres. Seed producer cooperatives or private investors are not in place for seed multiplication for rotation crops.
- Some of the tested soybean varieties tested were not uniformly mature. Soya bean processing companies require a minimum seed size, which is not easy to produce in the lowlands. Without proper management, field and storage losses of mung bean is very high.
- In hindsight, more attention for pest and disease control and storage in hermetic bags should have been given. This was done in 2019. For sorghum marketing, there was a good start in linking producers with buyers but this did not continue; farmers defaulted because of price volatility.
- More attention could have been given to cotton as an existing alternative cash crop and to the farmers' adoption of sunflower, as a new

emerging rotation crop that is important for in-country production of edible oils. Similarly, more attention could have been given to fodder crops.

Recommendations for diversifying farming and marketing systems

- Explore, test and demonstrate a broad range of crops and varieties in collaboration with farmers and mandated research institutes and extension services.
- Give explicit attention to rotation crops that are most important for sustainable farming practices, diet diversification and that have market potential, with due attention for seed supply, food habits, storage and farmer-company relations and, if appropriate for the feeding of livestock.
- Produce and share practical field guides explaining recommended agricultural practices to farmers.
- Plan the rotation crop promotion programme in collaboration with several stakeholders, both at the production and market side.
- Make sure that required quality seed and other inputs are timely available. In this context, ensure that the seed chain is operational, from (pre-)basic seed to farmers' seed.
- Align (relatively new) rotation crops to prevailing food habits and ensure awareness raising on food and nutrition. Prioritise local uptake of these rotation crops for local consumption (resident population and labourers).
- Play a facilitating role in connecting companies to sourcing areas, including the facilitation of the good understanding of delivery contracts. Invite companies to visit the production zone and discuss with farmers.



Without mechanization no transformation of the sesame sub-sector

Sesame production in NW Ethiopia is mainly based on human labour, except ploughing. Costs are increasing because wage rates are escalating because of labour shortages. Sowing is mainly done by broadcasting. Row planting is an essential part of the recommended practices for improving sesame yields and quality. Because of improved timeliness and quality of farm operations, mechanization can contribute a lot to productivity improvement and production cost price reduction, representing a value of millions of dollars. Although the sesame zone is very suitable for mechanisation, adoption of tested mechanisation options is limited due to several reasons: (1) limited knowledge on how mechanization contributes to productivity improvement; (2) skill limitations in operating and maintaining machineries; (3) lack of loan facilities for different farmer groups and absence of lease financing mechanism; (4) underdeveloped machinery supply chain, with limitations of after sales services and spare parts; (5) under-used potential of machinery rental services.

What went well

Based on years of testing of a broad range of machineries, tailored recommendations for the mechanisation of different categories of farms are available. Getting access to appropriate tractors is the key challenge. Several seeding machines addressing small, medium and commercial farmers were tested for efficient sesame seed sowing. These included animal drawn (3-5 rows), tractor mounted (4-14 rows) or chest held (3-5 rows); and ranged from simple local made to pneumatic precision planters and seed drillers (5-11 rows). There are increasingly options for mechanising weeding and harvesting; adaptations and further testing are however required.

What did not go well

While there has been a lot of effort and interest in machinery testing (the hardware), less attention has been given to the financing of mechanization and business model development (the software). Lease financing and machinery rental services are required to move to a real process of mechanization in the sesame zone. Furthermore, mechanization programmes do not give sufficient attention to the preparation of skilled labour to professionally operate and maintain tractors and equipment. The same holds true for repair and replacement facilities, especially in the remote rural areas. Due to poor performance of locally made animal drawn planters, mechanized row

planting for smallholders remains however a challenge (and an opportunity for manufacturers).

Opportunities

- Due to labour shortages and high costs of labour, farmers have a high interest in mechanisation. It can relieve farmers from dependency on animal power and human labour at critical periods during the agricultural season (planting, weeding and harvesting).
- Seeding and fertilizer application can be done at the same time, reducing costs and increasing efficiency. Improved timeliness of field activities can improve soil, water, pest and weed management.
- Investments for mechanizing the sesame sector in NW Ethiopia can significantly contribute to increased production, representing millions of US dollars.
- As of recent, the Government of Ethiopia allows tax-free purchase of machineries for farmers, cooperatives and unions, which removes an important financial barrier for mechanising the sector.
- Mechanisation can contribute to professional job creation (labourers, machinery operators, workshops providing maintenance service, rental service providers, ...).



Recommendations for action

- Support innovation centres for continuous technology development, testing, selection and promotion of machineries and implements like ploughs, planters, cultivators, harvesters and ripper binders, that are durable, efficient, easy to operate and maintain.
- Encourage and implement lease financing for sesame farmers and cooperatives, with active role and dedicated sesame sector mechanisation lease financing budgets of DBE, Walya and Kaza.
- Vision 2025: facilitate hundreds of mechanisation cases. Short-term action:

- support advanced cooperatives eligible for lease financing to exploit the tax exemption privilege and acquire a mechanisation package (tractor, row planter and trailer). Accompany the process for tax-free purchase (own contribution, business planning, lease financing and tax exemption request, issuance of certificate for implements); ten cases require 25 million ETB.
- Ensure optimal and efficient utilization of machineries: agreements between farmers/farmers' organizations and machinery suppliers: training of operators, technical support and after sales service.
- Create conducive working environments for qualified and equipped private enterprises, cooperatives and organised youth groups to engage in providing agricultural machinery rental service to farmers. Develop viable business models and train on efficient service provision, business and client management.
- Periodically revise economic policies, including loan products and interest rates, as well as legal and regulatory frameworks.

Options tested for field preparation	Options tested for row planting	Tested options for other operations
<p><i>Range of soil tillage machineries and implements:</i> The Massey Ferguson tractor is most commonly used and can be locally maintained. Mould board, disc and chisel ploughs increased sowing efficiency, improved water infiltration, reduced weed and pest infestation, enhanced crop development, thereby increasing productivity.</p> <p>- Encourage tractor makes that can be locally maintained; Use mould board and disc ploughs every year; Use chisel plough once every 3-5 years.</p>	<p><i>Lemken precision 6-row planter:</i> Efficient in maintaining seeding interval in the row and depth, and in seed economy (1.5 kg/ha as opposed to 4-5kg/ha seed in the traditional sowing).</p> <p>- Highly recommended for commercial farmers use</p>	<p><i>Agromaster cultivator:</i> Able to remove weeds within row. With narrow inter-row spacing, cultivation was only possible at seedling stages.</p> <p>- For sesame: Increase inter-row spacing from 40 to at least 60cm or change tractor wheels to slim types in order to avoid trampling of plants; Use it for wider row spaced crops like cotton, sorghum and sunflower.</p>
<p><i>Lemken rotary power harrow:</i> Efficient for seedbed preparation as it performs tillage, pulverizing, levelling and sowing at a time. Requires a heavy-duty tractor (>120hp), which is expensive.</p> <p>- Use on commercial scale with possible rental service to surrounding farmers.</p>	<p><i>SFOGGIA precision, 5-7 row planter:</i> Works well for cotton planting, not for sesame as it crushes sesame seeds while sowing, resulting in wetting of passage and blocking flow of seeds with uneven seed distribution.</p> <p>- Use for big seeded crops like cotton and sunflower</p>	<p><i>Alvan Blanch tractor-mounted harvester:</i> Was able to cut 0.6-0.8ha/hr; bind and convey bundles.</p> <p>- Recommended for use for sesame harvesting; train operators for managing the flow of strings; further testing for soya, sorghum, finger millet, sunflower and rice is needed.</p>
<p><i>Rumptstad walking tractor:</i> Very good in tilling the soil and easy to operate. It can have multiple functions (ploughing, planting, fertilizer application, weeding, threshing) and can be used for off-season activities (transporting, generating electric power and water pumping).</p> <p>- Appropriate for small and medium scale farms</p>	<p><i>SFOGGIA seed driller:</i> Comes in different row sizes (7, 9, 11 or 14). Very good in drilling, can sow 25 ha per day at 1.5kg seed rate per ha. Can be lifted by 70hp tractor and is easy to operate and maintain; and is durable and robust.</p> <p>- Highly recommended for wider use</p>	<p><i>MAZZOTTI tractor, model SAHARA 1-4x4:</i> Self-propelled, effective in cutting, strapping and throwing the bundle to the cut side of the field. Can harvest one hectare within 1.5hrs with minimum loss (<10%), low fuel consumption.</p> <p>- Recommended for use in sesame harvesting.</p>
<p><i>30hp Kyota tractor:</i> Very good in soil tillage (15-17cm depth). Can lift diverse light weight implements.</p> <p>- Use for slashing, ploughing, harrowing, cultivation, planting, harvesting and transporting by medium scale farmers and/or a group of small holder farmers.</p>	<p><i>Chest held seeding equipment:</i> Good in seed release, but requires furrow opener and seed covering implements additionally. Reduces the bending of labourers.</p> <p>- Recommended for family use and for youth offering specialised sowing labour services; Demonstrate at various locations in 2020.</p>	<p><i>Agromater tractor-mounted reaper binder:</i> Was good in cutting but poor in collecting, binding and conveying the cut sesame to the side. Losses are higher (15-20%).</p> <p>- Improve the operating system – only use it under severe labour shortage conditions</p>
		<p><i>Agromaster rotary cutter:</i> Was very effective in mowing weeds after sesame and other rotational crops harvest and before shading their seeds. It is an alternative solution for labour deficit areas. - Demonstrate at various locations in 2020.</p>

‘One Timad package for PSNP households’: a way for food self-sufficiency and resilience building

Wheat is one of the major crops grown on more than half a million hectares by more than 1.6 million smallholder farmers in the Amhara region. A baseline study in the PSNP *woredas* where REALISE is working, has indicated that productivity of wheat is about 1.6 tons/ha which is a fourth of the potential yield of improved wheat technologies released by the research system. One of the challenges faced by PSNP households is the standardized extension package for wheat designed for 0.5 ha of land is costly and unaffordable. The REALISE pilot developed a wheat extension package for one timad (0.25 hectare) at a cost of 1000 birr (30 USD). The pilot is also demonstrating the need for customizing extension to farmers in PSNP *woreda*'s with small landholdings.

A total of 60 PSNP client households were selected from Tach Gayint and Enebise Sarmidir *woredas* to participate with 0.25ha of land. The improved wheat varieties namely Tay and Qaqaba were used with recommended seed and fertilizer rate and improved agronomic practices. Small packages (13.5-15 kg) of NPSB fertiliser NPSB and small (12,5) packages of UREA were prepared according to the recommendations, and distributed on credit with cash repayment arrangements.

The one timad package is designed with three objectives in mind: (i) to downscale the package size of seed and fertilizer that match the need and capacity of PSNP households; (ii) to provide PSNP farmers access to improved practices through an interest free credit arrangement (iii) to minimize risk for farmers in taking up new technologies by introducing the proven technologies at the right (small) scale, and giving adequate hands-on training and follow-up.



Yield gain and return on investment

Compared to the baseline and the kebele average productivity of 1,65 t/ha, the Tach Gayint *woreda* the pilot has resulted in a yield of 3.5 t/ha, which is 118.75% increase in productivity of wheat when using compost together with the small 1000-birr wheat technology package. It resulted in a yield of 2.53 t/ha, an 58.31% increase, using the small 1000-birr package only. In Enebise Sarmidir *woreda* the small 1000-birr wheat technology package has resulted in a yield of 2.89 t/ha, which increase of yield by 81.25%.

The small 1000-birr package applied together with compost had the highest return on investment.

Return on investment

In Tach Gayint *woreda* farmers have invested ETB 1662.78 and ETB 1750.66 in Enebise Sarmidir *woreda* for seed and fertilizer to cover 0.25 ha of land. For fertilizer application and planting in a row they used additional labour of two man-day and those who applied compost used an additional two man-day for transporting. The Highest Net return (NR) was obtained with a small package applied with compost followed by small packages applied without compost.

What worked well

The small 1000 birr package of improved wheat technology proved to benefit PSNP farmers and similar interventions may result in higher return due to:

- By offering it in a small package tailored to 0,25 ha farmers use the recommended seed and fertilizer.
- The in-kind credit arrangement allowed them to use the package and suitable repayment period has encouraged them to use technology.
- The combined push of technology with the necessary hands-on training and follow up enhance the confidence of PSNP farmers.
- The yield increase in 0.25 ha assured calorie self-sufficiency.

What did not work well

- Initially the one timad package was designed for 1000 Birr investment considering that the inorganic fertilizer in the package would be supplemented by application of farm compost. But because of the late approval of the pilot, only 5 farmers in Tach Gayint prepared the farm compost. Hence, the pilots were done in most of the cases with application of inorganic fertilizers only.
- The downscale packaging of fertilizer and seed required legal approval and initially stakeholders showed low interest to participate.

Contractual agreements bolster early generation seed supply in Amhara regional state

One of the biggest challenges in raising the performance of the seed sector in Ethiopia is the current short supply of quality early generation seed (EGS) of preferred varieties.

EGS includes three different classes of seed, namely: breeder; pre-basic; and basic, that are used as the starting material from which certified seed is produced. Hence, by a different nomenclature, EGS is referred to as foundation seed.

Up until very recently in Ethiopia, research centres took on responsibilities of producing all four classes of seed, including certified in selected cases where no interest is shown by commercial enterprises to incorporate the variety in their product portfolios. Certified seed producers, both public and private with the exception of Corteva Agriscience (which recently acquired Pioneer Hi-Bred), have historically limited their focus to certified seed only.

Due to this division of labour, coordination between both parties is essential. However, due to a lack of clarity in responsibility, task division and the actual quantity and variety for which EGS is demanded, supply has been inadequate. Confounding the problem is that researchers have other responsibilities too. They are expected to develop and release new varieties; maintain already released varieties; and research, develop and popularize other technologies that lead to crop improvement.

Dialogue facilitated by ISSD Ethiopia led to the agreement to shift the current division of tasks to extend the responsibilities of certified seed producers to incorporate basic seed production as well, and focus the orientation of researchers on breeder and pre-basic seed multiplication exclusively.

Prior to 2017, weak integration of and coordination among key stakeholders in (early generation) seed production resulted in inadequate planning for EGS supply in the region. Even if a request for basic was made, two years would often pass by before sufficient quantities became available, during which time demand had lapsed.

Often, a mismatch between the supply of EGS by researchers and the demands of farmers was

observed. Between them were seed producers trying to make do with the quantities and varieties on offer and their constraints in responding to the needs of farmers. Either too much or too little EGS of a given variety was supplied at great cost or missed opportunity demanding on how you look at it. Important questions like 'who wants what; when; and how much?' were left unanswered.

The goal of the ISSD support was to sustainably improve the linkage and coordination between researchers, (early generation) seed producers and farmers for sufficient and efficient supply of quality EGS of demanded varieties in the region.



Contractual agreements between EGS and certified seed producers signed in the presence of Ato Agdew Molla, Amhara Bureau of Agriculture.

Results

A seed unit or dedicated team of researchers was established within the Amhara Regional Agricultural Research Institute (ARARI) responsible for forecasting EGS demand and translating it into production plans for centres under its management.

Forecasts have been conducted by expert groups uniting researchers and (early generation) seed producers including Amhara Seed Enterprise (ASE) and selected private seed producers and seed unions.

Specific agreements were reached on who produces what for whom, which by in large practice this shift in orientation of researchers towards breeder and pre-basic seed exclusively and certified seed producers towards basic seed production as well. Bilaterally, contracts were signed between both parties defining the specific terms of EGS procurement, including quantity, date of delivery and payment.

ISSD Ethiopia has facilitated these discussions and (re)organization of forecasting, joint planning and procurement. Through the inclusion of more actors, forecasts have improved in reliability and consensus and trust have been generated.

The seed unit within ARARI creates capacity for managing the process, whilst the involvement of both the regional seed core group and Bureau of Agriculture (BoA) enhance accountability.

In all cases, the BoA serves as a witness to and mediator of contractual agreements between EGS and certified seed producers.

What worked well

- Joint forecasting and planning for EGS production generated consensus and trust among actors.
- Contractual agreements gave clarity, can be enforced by both parties and were monitored and mediated by BoA.
- The system reduced the burden of BoA in managing sufficient EGS supply in the region.

What did not work well

- Contracts were weakly enforced, as deviations from and defaults on agreements were not uncommon.
- Actors are reluctant to commit to contractual agreements without external facilitation and pressure.
- Land shortages constrained EGS production.
- Contractual agreements between EGS and certified seed producers signed in the presence of Ato Agdew Molla, Amhara Bureau of Agriculture.

Enhancing Export Market of Ethiopian Spices

The Ethiopian spices sub-sector has been characterized by use of poor yielding varieties, traditional production technologies and agronomic practices, with a lengthy value chain, adulteration, improper post-harvest handling, and high market volatility. Subsequently the export of Ethiopian seed spices never passed USD\$ 2.6 million in value.

To enhance the Ethiopian export trade and private sector development the ENTAG program has been working on addressing market constraints of the spice sectors through creating better market linkages, technical and financial support to innovations, capacity building activities, and platform meetings. In 2019 ENTAG helped 14 private companies and two unions to introduce modern spices production technologies and out-grower scheme business models.

To transform the spice sub-sector of the country, ENTAG has been working on market linkages support with buyers based in United Arab Emirates and India and this resulted in export of Ethiopian spices worth more than one million USD.

ENTAG facilitated a forward market linkage with a contract volume of 1617MT of Turmeric, Rosemary and Ajwain seed, and worth \$1.075 million among three Ethiopian exporters and three foreign buyers based in India and United Arab Emirates. A business network has been established among 14 Ethiopian private companies, two unions, international spice and herbs buyers and technology suppliers.

What worked well

- Inclusive trade support with technical capacity building training on production and marketing worked well. As did trade missions, both forward and backward integration, and active involvement of private and government actors across the whole value chain.



An Ethiopian commercial farmer on a training mission in Vietnam – Vietnam trade mission, 2019.

- ENTAG worked in parallel with key stakeholders at regional state and federal levels, such as Ethiopian Coffee, Tea and Spices Agency, Ethiopian exporters, commercial investors, traders, development agents, model farmers, cooperative and union leaders. This created familiarity and trust at all levels making communication and follow-up effective.
- The increasing credibility of ENTAG was also of crucial importance in these achievements, thus ENTAG's collaboration with other partners was pivotal.

What did not work well

- Limited technical support in export contract facilitation and backward integration along with lack of export procedure and technical manuals caused contract defaults.
- Ginger disease outbreak and adulteration practices that corrupts the quality of products have also caused reduction of export volume.
- The political turmoil that has been erupting in different parts of the country hindered mobilities of ENTAG staff and stakeholders that would have resulted in better outcomes.

Post-harvest value creation and market linkages: Ethiopian sesame sector at the crossroads?

In past 5 years, SBN has conducted many studies and supported several specific initiatives, with the aim to increase country value creation, to establish constructive relations between value chain operators, and to improve the income of farmers and their organisations.

Except for some small successes, these did not lead to the targeted results (10% higher farmer income from value addition and market linkages). A three-page lessons learnt paper was prepared in the summer of 2019, highlighting all initiatives of the past 4 years and analysing the current situation and essential factors that inhibit product and market development.

Concerning the current context, the paper concluded that: (i) farmers can get a relatively high domestic price for raw sesame and are not rewarded for producing quality sesame or investing in value adding activities; (ii) there are no incentives for direct supplier-buyer relations; (iii) sesame is an expensive input for local food processing and (iv) policies for creating a more enabling business environment are missing (i.e. imported oil is subsidised, domestic/local oil is taxed).

As a result, post-harvest value creation is virtually absent and mainly confined to cleaning and artisanal oil production for the local market.

What worked well

In this context, the following project efforts worked out well: yield improvement for cost price

reduction, farmers' access to input credit, marketing credit for cooperatives to operate on spot markets (taking advantage of high ECX prices and reducing the risk of traders' collusion), first cleaning by cooperatives and unions, artisanal oil production for local markets using poorest sesame quality, production and marketing of rotation crops.

What did not work well

Many initiatives did not lead to results: direct export of unions, trade missions, sesame quality management and grading, storage and conservation, investments in cleaning and oil extraction, development of organic value chains. Under prevailing circumstances, it proved almost impossible to develop feasible business initiatives. At hindsight, less efforts should have been made, as product and value chain development proved to be an uphill battle.

Opportunities

Ethiopia has comparative advantages for producing highly valued white varieties (suitable for bakery industry), tasty varieties (suitable for tahini and halva consumers) and varieties with high oil content. There are opportunities for value added products such as hulled, toasted, roasted, and grounded sesame, oil, tahini and halva. Higher value markets (Middle East, Europe, North America, Japan and Korea) have clear requirements for the appearance, aroma, taste, oil content and purity of the product. Buyers from these markets are currently hardly interested to directly source sesame from Ethiopian producers, mainly because of quality and food safety problems.



Post-harvest value creation: a fundamental challenge for the Ethiopian sesame sector

Case overview
In 2017, SBN has made efforts to promote post-harvest value chain development and supplier-buyer relations. Studies were done and specific initiatives were supported. Based on the other disappointing results, this case shares some lessons learned. It appears that in the current situation, it is most realistic to report raw, undifferentiated sesame and if almost impossible to develop feasible business initiatives.

Background
More than 90% of the Ethiopian sesame is exported in bulk with the purpose to earn hard currency. This leads to highly offshored domestic market prices: the domestic sesame market price is higher than the international market price. Ethiopian sesame exporters are generally importers of other crops products. Foreign currency earned with sesame exports is used to finance the import business. Losses on sesame exports are recovered from the high margin on imports.

Low value international markets, mainly China, are the main destination of Ethiopian sesame. Current clients buy large volumes and are less concerned with quality. Higher value markets (Middle East, Europe, North America, Japan and Korea) have clear requirements for the appearance, aroma, taste, oil content and purity of the product. Buyers from these markets are currently hardly interested to buy Ethiopian sesame, mainly because of quality and food safety problems. Ethiopia has comparative advantages for producing highly valued white varieties (suitable for bakery industry), tasty varieties (suitable for tahini and halva consumers) and varieties with high oil content. There are opportunities for value added products such as hulled, toasted, roasted, and grounded sesame, oil, tahini and halva.

The Ethiopian Commodity Exchange (ECX) system considers seed purity and colour as grading criteria. Other parameters, such as oil content and seed size are ignored, leaving buyers who would like to target specific markets. For the current exporters, volume is more important than quality. Higher quality does not fetch a higher price. As a result, farmers and traders miss any kind of sesame quality before offering to the market.

The limited domestic market for sesame products is further exacerbating the situation. Sesame-based food products are not traded in the national food culture. Considering the market for edible oils and the current heavy reliance on imports, sesame oil production for the domestic market would be an option. Imported palm oil is however subsidised to make it accessible for the Ethiopian population, while locally produced oils are taxed. This hinders a transformation to Ethiopian production of edible oils.

The consequences of the current market organisation are that: (i) farmers can get a relatively high domestic price; (ii) farmers are not rewarded for producing quality sesame (iii) sesame is an expensive input for local processing; (iv) post-harvest value creation is virtually absent but mainly confined to cleaning and artisanal oil production.

Objectives
It is the context that SBN seeks to contribute to the development of a competitive, sustainable and inclusive sesame sector to improve farmers' income and create economic spill-over effects. Product and market development could contribute to achieving this goal.

- Initiatives**
In the past years, SBN, in collaboration with different stakeholders, has undertaken the following support activities to support business initiatives:
- Collection and analysis of international, ECX and spot market prices. Multi-annual data are available.
 - The analysis of the grading system helped to assess the needs of the current marketing system.
 - Study the option of putting crop residues to value (use of stalks for production (biomethane)).
 - Study of the existing storage and cleaning infrastructure in the Ethiopian.
 - Training of unions in the requirements of international markets and support for their participation in the annual ECX/ECM meetings and an international fair in Paris.
 - Support of an investor cooperative to visit potential business partners in Israel.
 - Co-organisation of a visit of Dutch entrepreneurs to the Ethiopian sesame zone.
 - Support to different entrepreneurs to develop local sesame oil extraction for the local market.
 - Support to an entrepreneur to develop and test a local cleaning machine suited for the spot market and managed by a local cooperative.
 - Support to Selen Clinic to mobilise internal capital put on the large cleaning machine into operation, followed by technical and financial support.
 - Support to organic sesame production and development of farmer-company relations, in Tigray and Benishangul.
 - Business development training and coaching for different entrepreneurs: among others sesame group and bioenergy production.
 - Support to entrepreneurs to develop a contact note for grant applications.
 - Cooperative marketing training for sesame cooperatives and unions, with support to their participation in fairs for promoting cooperative products in regional fairs.
 - Promotion of organic, honey bees and soy bean production and facilitation of marketing and sales.
 - Support to the development of recipes for organic and pulses for food preparation, with the aim to add value to the primary products, to create local small enterprises, mainly run by women, to sustain of farming households and livelihoods.

Achievements
The results obtained with the mentioned initiatives are very limited. In the current context, post-harvest value creation is hardly feasible, even if local entrepreneurs are motivated. Only the support for sesame cleaning and the processing and marketing of rotation crops worked relatively well. The business relations of several unions with buyers (other unions and one was successful) for two years, but collapsed after increasing domestic market prices, leaving the farmer default. Soy beans and mung beans now have to be traded through ECX. No organic sesame value chains, the current situation is that farmers are mainly organic producers (in fact not) and are mostly engaged in organic sesame business aimed off-peak/off-season in the context of the inflated domestic market.

Recommendations in the context of the current market system

- In the current system, wherein the country primarily exports sesame to the value-added markets and domestic prices are inflated, it is most realistic to focus on the following strategies for the improvement of farmer income and export earnings:
- Focus on selling to the ECX for farmers to take advantage of inflated ECX prices. This implies working efforts for quality improvement and direct market linkage, which have to be tested.
 - Reduce the cost of sesame production by yield improvement, which contributes to farmers' higher margins and for the country at large (higher production).
 - Improve access to formal input credit to reduce credit costs, to enhance the uptake of recommended agricultural practices and to reduce the dependency on informal money lenders.
 - Enhancing the presence of cooperatives at spot market level to reduce the risk of trader's collusion.
 - Promote the production, processing and marketing of current rotation crops, for sustainable production, risk spreading, nutrition, improvement and employment creation.
 - Explore the potential for other rotation crops, such as sunflower and labers.

This scenario is not necessarily the disadvantage of farmers. However, without market reform value chains are not developed and Ethiopia increasingly slides to competitive position in the international sesame market.

Recommendations for system change

- For developing post-harvest value creation and to establish real value chains with collaboration and transactions among different operators a package of fundamental changes is required, among others:
- Export licenses for professional sesame exporters, of which the business depends on successful market relations and who are not allowed to be engaged in import business as well. This would create a level playing field, as cooperatives and unions are also not allowed to export.
 - Alternative sources of hard currency for importing companies, who are then no longer needing additional inflows for currencies of import goods, as currently the losses of sesame trade are compensated by high prices for imported goods.
 - Grading system that facilitates improved traceability and quality and market differentiation, with additional parameters like oil content, seed size and free fatty acid. This would allow for market segmentation and price differentiation according to quality.
 - Promotion of direct farmer-trader/company relations and a quality-based marketing system, which starts at field and spot market level.
 - Stepping the subsidies on imported edible oil and tax exemption for locally produced oils.
 - Provision of sesame based consumer goods for the domestic market.
 - Policies for required mixed farming systems in the sesame production zone, to avoid mono-cropping, reduce risks of soil fertility losses and pests and diseases, increase production, processing and marketing of grapes and/or crops for edible oil production.

In this scenario, ECX prices would be aligned to international market prices, which in the short run is not to the advantage of farmers. Conditions for feasible post-harvest value adding activities would remain to be tested: cleaning, storage, drying and verification, processing, branding and labeling, packaging, marketing and sale of food products. An important challenge to develop these activities in a farmer-inclusive manner, e.g. to develop cooperative business entities.



A three-page lessons learnt paper was prepared in the summer of 2019, highlighting all initiatives of the past 4 years and analysing the current situation and essential factors that inhibit product and market development.

The inflated ECX prices are not to the disadvantage of farmers. Without market reform value chains are however not developed and Ethiopia is losing its position in the increasingly competitive international sesame market. As of recent, the Government of Ethiopia has set out to control ECX prices, so as to avoid that these are higher than international market prices. This may create a new business context, wherein ECX prices would be aligned to international market prices. In the short run, this would not be to the advantage of farmers. Conditions for feasible post-harvest value adding activities would however be created: cleaning, storage, tracing and certification, processing, branding and labelling, packaging, wholesale and retail of food products. An important challenge is to develop these activities in a farmer-inclusive manner, e.g. to develop cooperative business activities.

Recommendations for system change

For developing post-harvest value creation and to establish real value chains with collaboration and transactions among different operators, a package of fundamental changes is required, some of which are the following:

- Export licenses for professional sesame exporters, who are not allowed to be engaged in import business. This would create a level playing field, as cooperatives and unions are also not allowed to import. An important accompanying measure is to promote alternative hard currency sources for importing companies.

- Development of a grading system that facilitates improved traceability, quality and food safety, with additional parameters like oil content, seed size and free fatty acid, allowing for market segmentation and price differentiation according to quality.
- Promotion of direct farmer-trader/company relations and a quality-based marketing system, which starts at field and spot market level. This would be feasible if ECX prices reflect world market prices. Joint investments in cleaning and storage facilities and management would be important in this context, as food safety is a major concern.
- Tax exemption for locally produced edible oils (sesame, sunflower and others) and promotion of sesame-based consumer goods for the domestic market. In the current situation, imported palm oil is subsidized to make it accessible for the Ethiopian population, while locally produced oils are taxed. This hinders a transformation to Ethiopian production of edible oils.

Sesame cooperatives as farmers’ business organisations: an action plan

In the sesame zone, in NW Ethiopia, there are 247 cooperatives and ten cooperative unions. Most farmers are member of a cooperative. Although there are exceptions, most cooperatives are quite weak, with limited member ownership and internal capital. In the past years, SBN has increasingly cooperated with farmers’ primary cooperatives and cooperative unions, both at the production, market and institutional side. This note concentrates on a visionary, yet practical action plan, which is ready to be shared with high level officials.

The overall goal of SBN is to contribute to competitive, sustainable and inclusive sesame sector development for farmers’ income improvement and spill-over effects. Cooperatives which, also in Ethiopia, are defined as farmer-owned enterprises, can importantly contribute to this objective. What is strongly motivating this cooperative action plan is the one-liner: “If farmers earn thousands of birr, the country earns millions of dollars”.

What worked well and what is motivating an action plan for cooperative development?

Cooperative involvement in financial literacy training: more than 100 cooperatives involved and more than 20,000 farmers trained. Some 800 farmers were awarded a recognition certificate.

Four years of experience with providing marketing credit to unions and cooperatives, with support of a risk-sharing modality (Guarantee fund), involving three unions and 22 cooperatives.

In 2018-19, three banks provided a loan amount of 30.5 million (1 million USD).

Over 5000 farmers benefitted from on-lending, which helped to finance the last part of production season.

For three years, the repayment rate has been 100%. Trust increased between banks and unions/cooperatives, as well as between farmers and their coops and between cooperatives and unions. Many members purchased shares and opened bank accounts.

Methodology for kebele agro-economic (AE) planning, facilitating evidence-based planning for seeds, agro-inputs, machinery, farmer production clusters (FPC’s), training and input credit. First steps towards the establishment of a ‘triangle of collaboration’, involving farmer cooperatives, kebele administration/DAs, financial institutes, and loan committee.

What did not work well and what is motivating a plea for addressing the cooperative challenge?

Cooperative capacity development, which starts with cooperative auditing and assessment and internal resource mobilisation, has not been a major point of attention for SBN. Limited training of cooperatives, although there is strong demand.

The potential of farmer-to-farmer extension could have been better harnessed, which could have led to more farmer ownership. Practical farmer field schools and farmer business schools, owned by cooperatives, could have been established.



Ten actions

Ten key actions are suggested to improve conditions for cooperative self-reliance, cooperative roles for increasing production, value chain development and addressing the agri-finance challenge and for moving towards a cooperative inclusive development approach.

Practical recommendations for each of these actions are provided in the table below.

Farmer to farmer extension system

- Select performing farmers as trainers (Certificate of Competence);
- Organise Farmer Field Schools & Farmer Business schools as a joint effort of cooperatives and BoA. Organise Farmer Production Clusters (FPC's) on voluntary basis. Move towards an extension system that is less sensitive to high staff turnover, and combine it with new roles and incentives for DA's;
- Reach gots (sub-*kebeles*) that are not sufficiently reached;
- Use ICT, tablets, mobile phones and have a network of farmer 'plant doctors'.

Cooperative auditing and assessment

- Address auditing backlog in collaboration with RCPA and cooperative contribution;
- Profile and assess cooperatives, including self-assessment;
- Categorize cooperatives, with related support services and eligibility for loans.

Cooperative training

- Tailor FCA modules to sesame zone realities; Develop capacity of RCPA/WCPO and Unions to train, coach and support cooperatives;
- Develop and apply interactive training methods for adult learning.

Financial literacy farmer households

- Sustainable scale financial literacy training, based on current experiences and human resources and based on collaboration between Unions/cooperatives, RCPA/WCPO and BoA/WOoA;
- MoA scaling of institutionalisation of financial literacy training of DA's.

Kebele-to-Region agro-economic planning

- Scale and institutionalise *kebele* AE planning, based on current experiences;
- Involve farmers in seed production and marketing and in agro-input supply;
- Target farmers for input finance based on clear criteria (GAP training, proof of willingness to apply GAP, loan repayment history, local credit committee appraisal).

- Develop financial product, e.g. input credit of 6,000 ETB/ha for full package adopters with ceiling of 50,000 per farmer, disbursed in two phases (July-Aug and Sept-Oct);
- Develop a target acreage with full adoption for NW Ethiopia (for instance 300,000 ha in 2025) with annual targets and milestones, and corresponding input credit facilities and budgets.

Lease financing for appropriate mechanisation

- Mechanisation action plan, based on suitability of sesame zone, VAT exemption of agricultural machinery and expressed cooperative interest (confirmed machinery package: tractor, row planter, trailer / cost: 2.5 million ETB);
- Accompany interested cooperatives to acquire machinery (20% own contribution, business planning, lease financing and tax exemption request);
- DBE, Walya and Kaza lease financing for agricultural sector and cooperatives;
- Development of cooperative rental services.

Marketing credit for cooperatives and unions

- Pursue facilitation of marketing credit for unions and cooperatives with institutional risk sharing facility;
- Vision 2025: significantly higher loan amount, lower risk sharing (Gov/project: Bank), significant cooperative presence in marketing.

Cooperative post-harvest value creation

- Internal capitalization campaign - own assets and collateral important for self-reliance and access to finance;
- Cooperative value creation: storage, transport, cleaning, oil extraction, rotation crops, ...;
- At input side: cooperative or union input shops.

Direct supplier-buyer relations

- Linkage of cooperatives and unions to international buyers, based on international interest for Ethiopian sesame varieties and quality requirements (colour, size, taste, oil content, ...);
- Need for updated marketing policy after ECX pricing instruction / Need to create level playing field.

Sector information system

- Build further on *woreda* databases and piloted digital information system (EProd), based on collaboration between public institutions and cooperatives and unions;
- Vision 2025: digital planning, monitoring and reporting system, institutional memory ensured.

Guiding seed sector transformation

This case documents the success of ISSD Ethiopia's approach in achieving systemic change in recent time. It takes as its point of departure a year and a half ago and the pinnacle to the efforts described below. We look specifically at the achievement of the strategy document 'Transforming the Ethiopian Seed Sector: Issues and Strategies', draft national Seed Policy and proposed amendment to the 2013 Seed Proclamation.

In 2017, the opportunity for partnership at federal level presented itself when a former regional seed core group member was elected to office. Having become the Minister of Agriculture, the request to ISSD Ethiopia to engage in formal partnership was quick to arrive. The objective of the agreement was to facilitate greater stakeholders involvement in identifying, prioritizing and overcoming key challenges in the seed sector. In the second half of 2017, the National Seed Advisory Group (NSAG) was established to advise MoA on strategy and policy.

In April 2018, ISSD Ethiopia facilitated a workshop on seed sector governance to develop a shared vision for the transformation of the Ethiopian seed sector; support seed core group members to revise regional strategies on how best to transform the seed sector; and reflect on differentiated roles and responsibilities in governing seed sector transformation.

During this workshop, a vision of the sector in 2040 was conceived, intended outcomes and strategies for each building block of the sector defined, and the structures through which the seed sector would be governed in each regional state proposed.



Dr. Yitbarek Semeane presenting to workshop participants, including Ato Sani Reddi, State Minister for Agricultural Development and Policy, and Dr Dawit Alemu, BENEFIT portfolio manager, front and centre.

In November 2018, a workshop was organized to consolidate these efforts and to propose a national agenda.

By December 2018, the document 'Transforming the Ethiopian Seed Sector: Issues and Strategies' (henceforth, Transformation Agenda) incorporating these inputs was presented to the State Minister of Agricultural Development and Policy who endorsed it as the guiding document for seed sector transformation, nationally. This would later be published in 2019 by the MoA.

Hot on the heels of the Transformation Agenda's endorsement was the assignment to finalize the new draft seed policy. ISSD Ethiopia was tasked with facilitating that the differences between two competing versions of the seed policy be reconciled and a final draft emerge. The resulting draft seed policy was presented during a National Agricultural Research Council meeting in February 2019, and subsequently endorsed by MoA. It still awaits final approval by the council of ministers. To align the 2013 Seed Proclamation with the proposed new policy, an amendment has been drafted. The proposed amendment aims to more clearly define seed marketing in line with the concepts presented in the draft seed policy, Transformation Agenda and contemporary widespread practice of direct seed marketing.

A decade of ISSD in Ethiopia

2019 marked a decade of ISSD in Ethiopia. Ten years have passed since the concept note on Integrated Seed Sector Development in Ethiopia was endorsed by the Ethiopian Ministry of Agriculture (MoA), FAO and the Embassy of the Kingdom of the Netherlands (EKN) at Ghion Hotel in Addis Ababa. During this time, ISSD Ethiopia has achieved a great deal. It has introduced the model of local seed business (LSB) to more than 270 seed producer cooperatives and 50 development organizations across the country and enhanced pluralism in seed production. Farmers' use of quality seed increased 28% between 2014 and 2016, and since then ISSD Ethiopia has improved the availability and use of quality seed for more than four million smallholder households. To reduce bureaucratic burden, inefficiency and costly rates of carryover seed in store in some cases by as much as 85%, ISSD Ethiopia introduced the concept of direct seed marketing (DSM), piloted it, and helped scale its practice to 313 districts across the country. ISSD Ethiopia pioneered the establishment of independent seed regulatory

authorities in Amhara, Oromia and SNNPR to enforce regulation and to improve delivery of public services to the sector, including licensing, certification and quality assurance.

A strategy which greatly contributed to these achievements was the establishment of regional seed core groups in the four regional states where ISSD Ethiopia operates. These unite selected key decision-makers in the regional state arena, including: deputy-/heads of the BoA; directors of research institutes; representatives of public and private seed producers and farmers' organizations; and coordinators of seed related NGO- and multi-/bilateral projects. Jointly, they formulated interventions to overcome strategic challenges, coordinate developments, facilitate partnerships, channel financial and technical resources, monitor and support interventions and embed successful interventions in working practices. Much of the attention has been directed at underlying causes of systemic problems. As ISSD Ethiopia's presence continued and results materialized, collaboration was increasingly solicited at federal level. After years of investment in piloting innovation and facilitating dialogue, ISSD Ethiopia has generated good rapport to pursue sector wide and inclusive strategy involving institutional and regulatory reform.

ISSD project impact

Today there exists a stakeholder-owned and MoA-endorsed seed sector Transformation Agenda, draft seed policy and proposed amendment to the seed law. Whilst these results of the process outlined above are an achievement in itself, they are yet to lead to positive impact on the performance of the seed sector. What is a necessary and challenging task still to come, is translating these documents into action and the actual implementation thereof. ISSD Ethiopia has already started raising awareness for the strategies proposed in the Transformation Agenda. The Transformation Agenda has been presented to 24 MoA staff in the presence of the State Ministers, who informed their staff to incorporate the strategies proposed in their new multi-annual plan. With the same outcome in mind, a process has been started at the regional level and 700 copies have been distributed for public reference.

What worked well

Embrace systemic change

- ISSD Ethiopia did well to focus its narrative on systems, systemic change and the root causes

of stubborn problems the seed sector, and to raise the ambitions of its partners in this way;

- Developing the vision of tomorrow was a far better point of departure than dealing with the pressing problems of today, as it elevated the dialogue to a far more strategic level;
- ISSD Ethiopia employed a sector model, which helped participants in the process unpack complexity, realize the interdependencies between building blocks of the sector, and create a shared language.

Manage adaptively and inclusively

- ISSD Ethiopia worked in parallel with key stakeholders at regional state and federal levels, which created familiarity and trust at both levels making communication and follow-up effective;
- Exchange of experiences between one regional state and another created confidence for those lagging behind;
- The political environment in Ethiopia has been very dynamic and ISSD Ethiopia has been strategic in adapting to unfolding circumstances.

Invest in social capital

- The credibility of ISSD Ethiopia was also of crucial importance in these achievements, so ISSD Ethiopia's collaboration with other partners was pivotal;
- 'Having boots in the mud', has earned ISSD Ethiopia government's trust as a respected adviser;
- Finally, ISSD could not have embarked on a process of sector transformation without its dedicated and skilful staff.

Challenges

- It can be a challenge to work on systemic change with professionals from different organizations as they tend to approach issues and solutions primarily from their own field of expertise and interest;
- The turnover of staff in public institutions in particular has been an enormous obstacle (but also an opportunity if you consider ISSD Ethiopia's history with officials that have come to power);
- Systemic change is a slow game, considering that much of ISSD Ethiopia's efforts from as far back as 10 years' ago are only recently coming to fruition.

Institutionalize of CASCAPE’s validated Best Fit Practices in the National Extension System

BENEFIT-CASCAPE has been engaged in participatory action research activities involving testing, validation, scaling and capacity building for generation and uptake of innovations and agricultural best practices among smallholder farmers.

During 2016-2019, the implementation period, the project generated 26 best-fit practices that have been scaled out in 65 *woredas* reaching 863,495 farmers and covering 215,874 ha of land.

In most cases, the yields of cereals (wheat, maize, teff, barley and sorghum) and vegetables (potato, onion) and pulses (faba bean, soybean) have been more than doubled.

The higher yield is due to best fit practices composed of improved varieties (high yielding, disease resistant, early maturing) and management practices (soil-crop specific fertilizer recommendation, row planting, disease and pest management).

The 26 best-fit practice manuals for production of major crops were submitted to the extension directorate of MoA of which seven were already included in the national best practices extension package.

The national and regional research institutes have developed a wide range of agricultural technologies (e.g., improved varieties and management practices) but these have not been delivered to the farmers where the technologies are most needed to boost agricultural production.

Often, lack of farmer participation and contextualization of the research priorities with the needs, priorities and interests of farmers is presented as the major cause of failure for technology transfer to farmers.

BENEFIT-CASCAPE adopted a participatory action research approach involving researchers, extension workers and farmers in diagnosis, planning and searching for solutions to address production problems. This is conceptualized in the project as the “innovation path ways”, involving testing-validation-pilot scaling-pre-extension demonstration and scaling support.

Testing/validation activities are implemented in 10 so called “high intensity *woredas*” and scaled out to 55 other *woredas* in agro-ecologically similar settings. In order to facilitate the scaling process, a best fit manual is prepared for each technology after pilot scaling activities. The best fit manual consists of information about agronomy practices (variety, land preparation, planting time, fertilizer rate, etc.), crop protection, harvesting and post-harvest handling. This manual serves as an extension material to facilitate the innovation process.

CASCAPE aimed at institutionalizing the CASCAPE’s validated BFPs in the National Extension System.

As mentioned earlier, CASCAPE has followed a participatory approach. The CASCAPE approach has its own unique characteristics. Some of the distinguishing features of the CASCAPE approach are demand driven, bottom up planning, a high degree of participation of farmers and other stakeholders, local innovation and capacity development support and a value chain approach. This has contributed to generate different best fit agricultural practices.

The project has screened and documented 26 best-fit practices into manuals and handed them over to the extension directorate of the Ministry of Agriculture. Seven best-fit manuals have already been incorporated into the national best practice extension package: potato from Bahir Dar; garlic from Mekelle; soybean from Jimma; malt barley, maize and faba bean from Hawassa; and wheat from the Addis Ababa cluster. In addition, these practices are translated into Amharic and become the part the extension system.



CASCAPE’s Best Fit Practices Manual

More importantly, the best-fit practices validated and disseminated by the BENEFIT-CASCAPE programme have helped to achieve significant higher crops yields across different locations and agro-ecological zones. The yield advantage of CASCAPE Pre Extension Demonstration over local practices and national averages ranges from 40.80 to 97.39% and 31.98 to 120%, respectively. This indicates that overall, all CASCAPE-validated best-fit practices significant yield advantage contributing towards national and regional food self-sufficiency in Ethiopia.

For example, wheat is grown by 4.64 million smallholder farmers on a total area of 1.7 million ha in Ethiopia with a national average yield of 2.7 t/ha (CSA, 2018). With average yield of 4.9 t/ha in CASCAPE PED fields, annual production would be 8.33 million tons ($4.9 * 1.7 \text{ million} = 8.33$) if all wheat farmers adopt CASCAPE best practices.

This volume is approximately equal to the current national consumption level of hence substituting subsidized wheat grain import with outlay of the most scarce foreign currency of over 56 million USD annually.

We therefore argue that implementation of CASCAPE validated wheat-best practices holds the promise of bridging the production gap to achieve national wheat self-sufficiency.

What worked well

CASCAPE's strategy of technology development and scaling (development pathways) combined with its participatory approach has played a crucial role in generating different best fit practices. The standard protocol developed by CASCAPE project to evaluate the applicability and scalability of the best fit practices worked well. The involvement of different stakeholders (e.g. extension and research) in the preparation and review of best fit practice manuals was also a crucial contributing factor to the uptake of the best fit manuals.

What did not work well

- Only seven best fit practices were incorporated into the national best practice extension package
- Delay in delivering the best fit practices manuals to the Ministry of Agriculture. Some of the manuals which were recently handed over had already been prepared in the previous phase of the CASCAPE project.



Handing over CASCAPE's Best Fit Practice Manuals

What would you do differently?

- Incorporating all the available best fit practices in the extension system.
- Hand over best fit practice manuals timely by creating a strong linkage with the extension system.

Recommendations

In order to be successful, others who are working on a similar project can adopt the CASCAPE best fit practice development pathways. It is also advisable to undertake joint planning and implementation with relevant stakeholders across the value chain in order to identify demand driven best fit practices.

Suggestions

To bring about a wider impact in the livelihoods of smallholder farmers, scaling of different best fit practices of CASCAPE using the BFPs manuals in similar agro-ecology is of paramount importance to increase production and productivity and thereby to contribute to food security at the national level.

The Journey to Establish the Ethiopian Pulse Council

Pulses are important food and cash crops in Ethiopia. The country produces close to 3 million tons, exports over 265 USD million per year and millions of farmers earn their livelihood from pulses. Ethiopia is the second major producer in Africa and can grow almost all types of pulses. Pulses are grown for food and nutrition security, cash source and soil health. Ethiopian people have a strong and long tradition of consuming pulses as a crucial source of protein.

The sector however has its problems: it has been suffering from disease, lack of input, poor quality and market orientation, weak coordination and harmonization among different stakeholders.

ENTAG has been facilitating a legume business platform and sector coordination for the last four years with an aim to bridge some of the foregoing gaps. The legume business platform aimed at (1) facilitating dialogue on critical policy and operational issues aimed at addressing systemic bottlenecks within the pulse value chains (2) facilitating market linkages among actors at different levels of the chain (3) strengthening the institutional base of the pulse sector by creating a dynamic public-private partnership platform.

The idea of Establishing Ethiopian Pulse Council has been a major subject of discussion for the last three years on ENTAG legume business platform meetings. Establishment of private-public organization in the form of council is believed to bring (1) harmony and synergy of investments within the pulse sector (2) leverage room to pro-actively address pressing issues such as aflatoxins/MRL, disease outbreak and regulatory bottlenecks (3) develop the capacity of the sector and bring balanced public-private contribution.

In 2017, a team of people from the private sector, regularly participating on ENTAG legume business platform, and representatives of Ethiopian Pulses, Oilseed and Spices Processors and Exporters Association with backing from ENTAG have been assigned to develop a concept paper for the establishment of Ethiopian Pulse council. However, the formation of the council did not progress until the ministry of agriculture took the lead role in 2019. The first attempt to establish a council without leadership of appropriate government ministry was strongly objected by Ethiopian Pulses Oilseed and Spices

Processors and Exporters Association (EPOSPEA) mainly because on the one hand the association wanted to use the council as an important pillar to advocate the interests of its exporting members with key policy makers and on the other hand there was a concern that the newly to be established council would compete with the former in terms of membership and resources.

In June 2019, representatives of the ministry presented the idea of Pulse Council on the seventh legume business platform and formal agreement was reached among key stakeholders that the idea should go forward with a leadership of the ministry. The participants of the platform nominated twelve people from the public sector, private sector and research to develop the establishment proposal for Ethiopian Pulse Council. This team is led by the Crop Director of the Ministry.

The first proposal write-up workshop was organized in November 2019 in the presence of all the eleven members of the team and facilitated by ENTAG. The team formulated a proposal that highlighted the key problems encountered by the pulse sector, the opportunities, the rationale for the pulse council, potential service assortment of the envisaged council and its vision, mission and objectives.

The draft proposal was presented and endorsed by two State Ministers of Agriculture, both showed strong interest to make the pulse council as a show case to possibly extend the concept to other sectors. After including feedback from different experts and officials, the Ethiopian Pulse Council Proposal writing team met and finalized the proposal early January 2020 to be tabled to Minister of Agriculture and ultimately to the Council of Ministers for official approval.



Consultative meeting with high level stakeholders on the formation of Ethiopian Pulse Council, 2019.

Vision, Mission and Strategic Goals of Ethiopian Pulse Council

Vision: By 2030, Ethiopian Pulse Council aspire to create an internationally competitive pulse sector driven by technology and knowledge that significantly contributes to food and nutrition security, environmental resilience, increased income for smallholders, processors, exporters and local traders.

Mission: Explore new frontiers for sustainable, economically profitable, traceable and marketable pulse production, processing, marketing in Ethiopia.

Strategic Goals

- Improve productivity and production by enhancing access to inputs (seed, agrochemicals, fertilizer-bio), service (finance and insurance, logistics, quality assurance, infrastructure), farming practice (extension).
- Improve Ethiopian Pulse Quality Competitiveness and achieve zero rejection from the international market by implementing quality assurance mechanisms across the value chain- traceability, certification, standard, institutional capacity, extension.
- Support value addition in pulses by mobilizing partnerships product development, processing, fortification over the coming ten years.
- Enhance market competitiveness- of Ethiopian Pulses by improving market-orientated production, quality focus, branding, promotion and packaging.

Potential impact

The Ethiopian Pulse Council establishment documents are more or less finalized and developed with active participation of the private and public sector, and endorsed by the two state ministers of agriculture. While the process to reach to this stage is a result by itself, the final outcome and ultimate impact on the sector is yet to come. A major task ahead is to formally establish the council, establishing it as an independent organization with active private-public sector participation and making it one that steers transformation of the Ethiopian Pulse sector in the long term. The proposal writing team and also state ministers involved strongly believe that the Ethiopian Pulse Council could potentially be a model for other sectors on how to create a sound platform and sector institution with active participation of all relevant stakeholders and move away from the traditional silo and top-down state driven models towards a more inclusive and private friendly and -driven sector transformation

agenda. The envisaged institution is foreseen to address issues across all the value chains with a key role of mobilizing the private, development, research and public sector to make the appropriate investment in harmonized way and address issues in systemic and proactive manner.

What worked well

Shadow Role and Inclusive Proactive Drive

- ENTAG took a shadow role in facilitating the process and creating a space for full ownership core actors led by the ministry of agriculture;
- The Ethiopian Pulse Council is developed with the vision to address current problems and drive future growth of the sector in an inclusive approach.

Holistic View

- The Public-Private partnership model as an organization for addressing structural and systemic issues within the sector is being deployed as a first of its kind in Ethiopian Agriculture;
- The idea of the pulse council when presented to the management of the ministry of agriculture created an inspiration to replicate it to other sectors, though ENTAG insisted the model first have to be proven before replication;
- The political landscape in Ethiopia has been dynamic and there is strong willingness to listen to new ideas for transformation of pulse sector.

Building trust and relationship matters

- The credibility of ENTAG and building trust and relationship played an invaluable role in embedding the leadership of pulse council establishment process to the ministry;
- The ENTAG management team and sector coordination team has shown agility in resolving differences and listening to feedback from EPSOPEA and other sector actors;
- Finally, the composition of the proposal development team from public, private and research was a complete team with different lines of thought and brought a comprehensive outlook to the concept.

What did not work well

- At the beginning ENTAG was playing a more front push role without proper backing of the public sector and encountered objection from EPSOEA.
- Coordinating the process takes time due to several changes within the government sector and hence delayed the final formation of the council.

Kebele Agro Economic Planning: supporting bottom-up planning and stakeholder collaboration for successful sesame-based farming systems

Since 2017, with the aim to address the smallholder sesame farmers' challenge to access seeds, agro-inputs, training and input finance, SBN has been promoting bottom-up planning. The *Kebele* Agro-Economic Planning (KAEP) was piloted in 2017 and 2018 in 24 *kebeles* (2 *kebeles* per 12 *woredas*). In 2019, after getting the buy-in from stakeholders at different levels, the activity was extended to 50 *kebeles*.

The yield gap in sesame production is still large. Instead of 8-10 quintals, most farmers do not get more than 4 or 5 quintals per hectare. This implies that farmers earn less than what is possible and it means that Ethiopia earns less from sesame exports, which are crucial for reducing the large trade deficit of the country. In addition, the yield gaps of rotation crops are large as well.

The most important limiting factors for farmers' adoption of good agricultural practices are limited access to quality seeds and agro-inputs, row planters and to input credit. These bottlenecks have so far been insufficiently addressed. This requires coordinated action of different stakeholders, working together as a team.

For this purpose, SBN developed a practical tool for KAEP that is composed of a planning format, accompanied by an explanatory guide. The tool envisages that a tripartite *kebele* team works on the profiling, assessment, mapping and planning. This team is suggested to be composed of: (1) *Kebele* administration and DA's; (2) Farmers and cooperatives and (3) Local financial institutions and the *kebele* credit committee.

The main objective of the activity is to strengthen the collaboration and synergy among the *kebele* level stakeholders. Specific objectives are: (i) Collaboration between DA's and cooperatives for training and coaching of farmers and for adequate and timely supply of the required quantity of quality seeds and agro-inputs; (ii) Better information of financial institutions on the best targeting of agricultural credit (to trained farmers, who are seriously interested in the adoption of best agricultural practices and who have a good credit repayment history) and (iii) Organisation of clusters of collaborating farmers, allowing them to improve

results and organise themselves for mechanization solutions, with a focus on row planters. The collaboration would create a 'win-win' situation for the collaborating partners: better training and coaching of farmers, adequate and timely supply of required quantity and quality of seed and agro-inputs, better risk management for financial institutions and effective uptake of the recommended agricultural innovations.

What worked well

- KAEP tool has been piloted and updated, based on experiences in 2017 and 2018.
- Higher officials of ACSI, DECSI and BoA were actively participating in the 2019 exercise, indicating that collaboration and bottom-up planning is increasingly seen as relevant for the sector.
- During training of KAEP committees and elaboration of 48 KAEP documents it was recognized that the planning tool helps to (i) define and visualize the realities of the *kebele*; (ii) identify agro-input and agricultural credit needs and (iii) to define the credit amounts per hectare (for sesame and possibly rotation crops).
- Joint identification of agricultural credit needs, using the following criteria for farmer selection: confirmed sesame farmers, training in 20 steps, application or will to apply good practices, capacity to finance part of the farming activities, no outstanding loan.
- The analysis of credit needs and gaps, per *kebele*, *woreda* and the sesame zone at large can be used to provide input for discussing the efforts to be made to avail enough credit to the farmers, without which the increase of production will not be possible.

What did not work well

- In the first two years, the newly developed tool was tested, but, at hindsight, it has to be acknowledged that formal buy-in of the regional authorities, cooperative unions and headquarters of the financial institutions should have been sought.
- Both in 2018 and 2019, the follow-up on the planning was not successful due to the late start of the activity and farmers' outstanding loans with the financial institutions.
- Although it varies from one *woreda* to another, credit allocation to identified farmers is not up to expectation.
- The KAEP is largely done by the development agents. The actual commitment of other

stakeholders is still limited; doing business as usual is still quite strongly prevailing.

Recommendations

- Ensure official approval from higher level officials. Formal approval in writing is indispensable for lower level officials. Invest in thorough discussions with higher officials so that the bottom-up planning can be an integral part of their work.
- Start the process much earlier, preferably in November-December, so as to have *kebele* plans and consolidated *woreda* plans ready at the beginning of the European calendar year.
- Define the credit amounts per hectare (for sesame and possibly rotation crops), with consideration of a minimum percentage of farmers' own capital. This allows to assess the credit needs for the next season, per *kebele*, *woreda* and the sesame zone at large.
- Set clear targets for acreages with full adoption, define the input credit amounts per hectare and per farmer for full adopters, with the aim to decide on the amount of credit available for the next season, preferably specified per *kebele* and/or *woreda*. In dialogue with regional administration, regional BoA, Union leaders and DECSI/ACSI.
- Aim at introducing KAEP in all sesame producing *woredas* and *kebeles* by 2020.
- Consider the KAEP bottom-up planning tool and process as a method for RAISE-FS. Pilot KAEP in other regions for other food systems.



Towards a digital information system – first experiences for the sesame sector

To support the sesame sector, SBN has promoted the use of information management systems. This started with an Excel database (2016-17) and evolved with a pilot in four *kebeles* to establish a sector management information system, based on a tailored, more advanced software application (2018-19).

Agricultural production takes place in rural areas, often remote from tarmac roads and towns. These conditions make it difficult to gather reliable and detailed sector information and to provide services to stakeholders. With increased access to computers and internet, public agencies and farmers' organisations in the commercial sesame sector increasingly have the ambition to have a digitalized information system, with the aim to gather, share and use consolidated information for professional planning and management, transparency, collaboration and trade.

The vision is to have a public digital information management system for the sesame sector, that is up-to-date, reliable and accessible, supporting all sector stakeholders, paid through a levy system. Specific objectives include: (i) support transparency with a public database; (ii) facilitate the provision of public services by government agencies to farmers; (iii) promote in-depth sector analysis through customized reports; (iv) digitalize member administration of cooperatives and support information exchange between cooperatives and unions. For 2016-2019, the objectives were to contribute to a stakeholder-owned database, used for planning, monitoring and evaluation (Excel) and to have a proof of concept for a digital information management system.

Which steps were made?

The first step towards information management was the establishment of *woreda* databases in Excel, which is a widely available and known tool. Databases were developed, based on available information on key parameters such as population, land, cultivated acreages for different crops, production, productivity and market prices. Whenever possible, attention was given to disaggregate information according to gender and age. By the end of 2017, the databases were handed over to 13 *woredas* and a training on using and maintaining the database was provided.

Two digital information systems were introduced in 2018 (FarmForce and eProd). Both systems are specifically developed for smallholder agricultural production and marketing in remote areas and work with a mobile application to collect field level data, including GPS references. A desktop application allows for extensive analyses of collected data and can generate several reports. Several stakeholders of the sector, BoA, CPO, unions and cooperatives, have been involved to build a sector-wide information management system that meets their data and information needs. The piloting of the digital information systems was done in two *kebeles* in Tigray and two *kebeles* in Amhara region, based on the eProd software, which was further developed and tailored for the sesame sector. By the end of 2019, field and farmer information was entered in the system for four *kebeles* (6,677 farmers), two *kebeles* in Amhara (3,038 farmers) and two in Tigray (3,639 farmers).

Achievements

The process of providing the Excel database and developing the digital information system, which included working with handheld devices and software, training and frequent discussions, resulted in stakeholders perceiving the importance of reliable digitalized field data. As partners in tailoring the software, they have gained insights about how to: i) work with software programs, ii) structure and prioritize information iii) organize data collection and quality control, iv) exchange information with other partners and v) analyse data and produce a report.

Lessons learnt

Limited infrastructure and human capacity.

Stakeholders hardly own functional hardware to install the software. Power cuts, virus infections and damaged hardware make installation and reliable functioning of the software challenging. In addition, stakeholders have limited experience to work with computers and any type of software. As a result, the training of dedicated staff members is time-consuming. A complicating factor is high staff turnover.

Start with a simple solution and have a multi-step introduction approach.

The excel based *woreda* databases featured several benefits like low cost, easy understanding and use, and flexible formats. In the context of non-existing digital data collection practices and a non-conducive environment, it was a big step from a

simple Excel database to a customized public information system.

In hindsight, a more incremental approach, with a modest scope at the beginning, could have reduced the time and investments for getting a digital information system up and running. This reduces the risk of errors and limited use of the information system.

Software customization. The software was adapted to accommodate specific needs and translated in local languages. Translation from English to Amharic and Tigrinya was a very time-consuming exercise. A tailor-made system increases the likelihood of relevancy and future use by local stakeholders.

User friendliness. Some software interfaces are more intuitive and easier to use than others. A combination of a simple mobile and advanced desktop application is a good solution to accommodate the different stakeholder capacities and needs.

Offline functionality. In a context of unreliable access to internet, an offline system is a valuable asset.

Data collection and modification. Data collection in the field, including GPS referencing, takes time. Stakeholder expectations and data correction need to be carefully managed. Moreover, if data entering or correction is not carefully managed or users can easily modify the format (Excel), data collection, quality and aggregation are at risk. Digitalized systems and consistent processes can help to reduce this risk.

Data aggregation and multi-stakeholder accessibility. Software systems make it easy to aggregate data at different administrative levels (e.g. from *kebeles* to *woreda*, zone and regional level). The generic information can be easily accessed by various stakeholders, who can add and manage additional information streams according to their specific needs. This requires dedicated, competent staff.

Community acceptance. The most important data input providers are farmers. Providing personal information requires trust and understanding. Careful introduction with the help of community leaders or local authorities is key. Clear benefits, such as weather forecast services and others, enhance the likelihood of acceptance.



Stakeholder support and benefits. BoA and unions supported the hosting of staff and shared costs for transport (motorcycles). This contribution is important, especially for creating ownership. Benefits of the information system stimulate users to make an effort and invest.

Technical assistance. Digital tools are complicated and can face many technical problems. A computer expert knowing the information system is needed to support stakeholders with any challenges they face along the way.

Sustainability/affordability of scaling. The introduction of advanced information management systems comes at high implementation costs (field staff and experts, computers, phones, motorbikes). System licenses are often expensive and require yearly payments in forex, which is an issue in Ethiopia.

Integration into daily processes. The organisations participating in the pilot are used to a certain way of working and procedures. Integrating a new information management system in daily work routines is a major challenge. This requires the support and commitment of higher officials.

Perspectives

Moving towards a digital information system is a long process. During the past years, the pilot in the mentioned four pilot *kebeles* is a first proof of concept. The next step is to explain the process, lessons learnt and current proof of concept to higher officials of different stakeholder organisations, who increasingly mention the need for a digital system.

High level buy-in can facilitate the change of work routines and the search for sustainable funding, for which a levy system is a possible solution.

‘Small Scale Commercial Poultry Production for Youth Employment’

Youth unemployment is a major development challenge for the government of Ethiopia. The REALISE PRA study reveal rampant youth unemployment in the program target *woredas* which is exacerbated by limited access to productive resources such as land, credit, and information.

The government has devised different policies and strategies to address this challenge, and there are efforts by various organizations including development partners to generate evidence and show cases on functional and scalable youth employment strategies and interventions.

However, there is not sufficient documented evidence that points to potential sectors or specific interventions and practices that contribute towards youth employment creation.

In view of this, REALISE set out to pilot small scale commercial poultry production as a youth employment intervention. The evidence generated and lessons learnt from this pilot shed some light on possible areas of engagement for rural youth, using limited financial input and strong collaboration among stakeholders.

The poultry pilot is being implemented by Woldia University cluster. Two *kebeles* (Sirinka and Timtimat) were selected from two REALISE target *woredas* (Habru and Wadla) as implementation sites. A total of 16 youth (8 young men and 8 young women) were organized in a group. The group was provided with 800 chicken, chicken

feed, and chicken house construction materials on a credit basis. Moreover, group members were trained on the basics of how to take care of young chicken including feeding, cleaning, heating and vaccination schedules.

After taking the training, the youth constructed the chicken house by themselves by investing their labour and supplying locally available construction materials for the house construction. They also produced a water container and feeder from locally available plastic material.

In order to ensure that the group is responsible and liable to the outcomes of the intervention, the provisions were arranged through a local micro finance institution mainly Rural Saving and Credit Cooperative (RuSACCO). In this way, the program has channelled grant funds to the RuSACCO, and the RuSACCO, in turn, has financed the purchase of provisions. For this it charged a 2% administrative fee. Under this arrangement, the group is expected to repay the initial costs incurred to the RUSSACO so that the fund will be reused to finance another group of youth to engage in income generating activities. In order to minimize default on repayment, group members are engaged in compulsory saving with the RuSSACO.

The small-scale commercial poultry intervention was designed to generate evidence on the potential of small-scale commercial poultry production as an employment creation activity for rural youth. In addition, the intervention expected to create awareness and enhance the adoption and dissemination of poultry technologies in PSNP *woredas* of Eastern Amhara.



Project impact

Most chicken and egg production interventions are challenged by high mortality rates in the early stages. Therefore, care was taken to increase the survival rate of the chicken by providing all the necessary care including heating and regular vaccination and supplying three-month-old pullets. Accordingly, 98.25% of the pullets (or 786 out of 800 chicken) have survived until now and are found in good health. During the 2019 implementation year, average daily egg production rate out of 786 chickens is 632 (80%) recorded at the age of 160 days. the minimum and maximum daily egg production rate out of 50 chicken/per youth is 36 (72%) and 42 (84%) respectively.

The group has already started selling eggs. On average, each youth has earned 1485 birr within the last two weeks of December 2019. The youths started saving money as well as paying credit service charges to the respective RuSACCO in their area. The first cycle of loan repayment is in April 2020 and the youth are ready to pay 25% of loan.

What worked well

- Small scale commercial poultry production is a viable option to create employment opportunities for rural youth.
- The potential for scalability mainly depends on involvement and commitment of the youth in terms of business idea generation, labour, material and financial contribution so as to create a sense of ownership and sustainability.

- The REALISE intervention adopted a holistic approach in that the organized youth groups were trained for basic technical skills and knowledge, provided with material support, linked with local financial institutions, and supported through regular monitoring and follow up. This kind of approach provides time for the youth to learn, practice and build confidence.
- Having access to finance and other productive resources is crucial in the process of youth employment creation. Often youth do not have land or other collateral to back-up their financing requirements, and this prevents them from engaging and benefiting in potentially profitable opportunities existing in their area. Therefore, working out the strategies and options to increase their access to productive resources is crucial.
- Collaboration among different stakeholders plays a significant role in the success of youth interventions. Stakeholders bring in technical, financial as well as decision making capacities.

What did not work well

- Initially, some of the youth were reluctant to participate in the pilot. But later on, they changed their mind.
- Despite signing an MoU, some livestock experts at *woreda* and *kebele* level were less committed for monitoring and delivery of technical support for the youths. However, through continuous discussions and follow up they have improved.

Appendix 2 Detailed information key performance indicators

In line with the guideline for reporting results in the thematic area Food and Nutrition security, the five BENEFIT programmes report on the following key performance indicators.

Impact	Improved sustainable food, income, trade and nutrition security of rural households in Ethiopia			
outcome	Pillar 1: Increased quantity and quality of sustainable agricultural production	Pillar 2: Market Dynamics	Pillar 3: Improved enabling environment	
outcome indicators	<p># of farmers reached with increased productivity (ISSD, CASCAPE, SBN, ENTAG, REALISE)</p> <p>(2019) 2,029,894 (2018) 1.813.946 (2017) 1.740.820 (2016) 910.745</p>	<p># of hectares of farm land used more eco-efficiently (ISSD, CASCAPE, SBN, REALISE)</p> <p>(2019) 341,338 (2018) 114.998 (2017) 564.858 (2016) 285.452</p>	<p># of companies with supported plan to invest, trade or provide services (ISSD, SBN, ENTAG)</p> <p>(2019) 60 (2018) 1.048 (2017) 260</p>	<p># of substantial policy changes/ reforms contributed to (ISSD, CASCAPE, SBN, ENTAG)</p> <p>(2019) 25 (2018) 19 (2017) 7 (2016) 5</p>
	<p># of farmers reached with improved access to input markets (ISSD, SBN, REALISE)</p> <p>(2019) 972,482 (2018) 1.388.861 (2017) 1.340.439 (2016) 62.613</p>	<p># of farmers reached with improved access to output markets (SBN, ENTAG)</p> <p>(2019) 35,094 (2018) 32,363 (2017) 11,914 (2016) 5,046</p>		
	Improved stakeholders capacity in agricultural practices (knowledge and skills)			
	output indicators	<p># of persons reached/ trained with improved technology and skills (ISSD, CASCAPE, SBN, ENTAG, REALISE)</p> <p>(2019) 61,692 (2018) 56.982 (2017) 86.085 (2016) 5.282</p>	<p># of trained farmers in sustainable agricultural production and practices (ISSD, CASCAPE, SBN, REALISE)</p> <p>(2019) 180,261 (2018) 261.334 (2017) 241.228 (2016) 18.093</p>	

Disaggregated data partnership key performance indicators 2019

Indicator	ISSD	CASCAPE	ENTAG	SBN	REALISE	Total 2019
Indicator P1 EKN 1.1: Number of farmers reached with increased productivity (total)	966,931	863,495	10,034	54,882	134,552	2,029,894
Indicator P1 EKN 1.1: Number of farmers reached with increased productivity (direct)	26,309	36,987	281	54,882	22,445	140,904
women	9,193	10,006	30	12,451	9,636	41,316
men	17,116	26,981	251	42,431	12,809	99,588
under 35	6,638	10,652	175	20,886	4,069	42,420
over 35	19,671	26,335	106	33,996	18,376	98,484
% women	35%	27%	11%	23%	43%	29%
% men	65%	73%	89%	77%	57%	71%
% under 35	25%	29%	62%	38%	18%	30%
% over 35	75%	71%	38%	62%	82%	70%
Indicator P1 EKN 1.1: Number of farmers reached with increased productivity (indirect)	940,622	826,508	9,753	0	112,107	1,888,990
Indicator P1 EKN 1.2: Number of hectares of farmland used more eco-efficiently (total)	66,924	215,874	0	57,186	1,354	341,338
Indicator P1 EKN 1.3: Number of farmers reached with improved access to input market (direct & indirect)	966,931	0	0	5,551	0	972,482
Indicator P1 EKN 1.3: Number of farmers reached with improved access to input market (direct)	26,309	0	0	5,551	0	31,860
women	9,193	0	0	1,573	0	10,766
men	17,116	0	0	3,978	0	21,094
under 35	6,638	0	0	2,842	0	9,480
over 35	19,671	0	0	2,709	0	22,380
% women	35%			28%		34%
% men	65%			72%		66%
% under 35	25%			51%		30%
% over 35	75%			49%		70%
Indicator P2 EKN 2.1: Number of companies with support plan to invest, trade or provide service	28	0	25	7	0	60
Indicator P2 EKN 2.2: Reached # of farmers with improved access to output markets	0	0	4,500	30,594	0	35,094
Indicator P3 EKN 3.1: Number of substantial policy changes/reforms contributed to	5	9	5	6	0	25

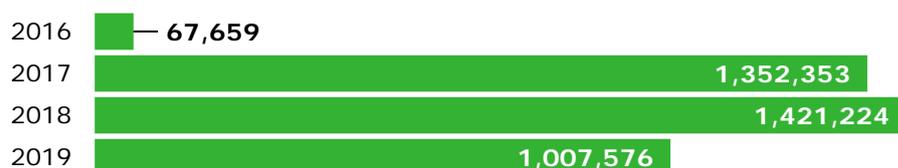
Indicator	ISSD	CASCADE	ENTAG	SBN	REALISE	Total 2019
Indicator EKN O 1.1: Number of persons reached/trained with improved technology and skills (direct + indirect)	56,090	2,315	0	2,746	541	61,692
Indicator EKN O 1.1: Number of persons reached/trained with improved technology and skills (direct)	18,290	2,315	0	2,746	541	23,892
women	7,304	448	0	934	404	9,090
men	10,986	1,867	0	1,812	137	14,802
under 35	4,847	347	0	1,263	142	6,599
over 35	13,443	1,968	0	1,483	399	17,293
% women	40%	19%		34%	75%	38%
% men	60%	81%		66%	25%	62%
% under 35	26%	15%		46%	26%	28%
% over 35	74%	85%		54%	74%	72%
Indicator EKN O 1.2: Number of trained farmers in sustainable agricultural production & practices (direct + indirect)	8,070	2,468	0	162,395	7,328	180,261
Indicator EKN O 1.2: Number of trained farmers in sustainable agricultural production & practices (direct)	7,124	2,468	0	86,524	7,328	103,444
women	2,781	1,026	0	32,033	4,433	40,273
men	4,343	1,442	0	54,491	2,895	63,171
under 35	2,206	370	0	28,367	3,324	34,267
over 35	4,918	2,098	0	58,157	4,004	69,177
% women	39%	42%		37%	60%	39%
% men	61%	58%		63%	40%	61%
% under 35	31%	15%		33%	45%	33%
% over 35	69%	85%		67%	55%	67%

Partnership key performance indicators 2016 - 2019

Number of farmers reached with increased productivity (TOTAL)



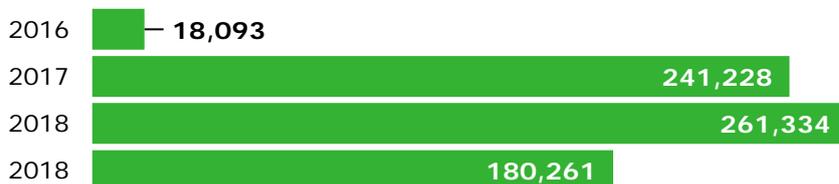
Number of farmers reached with improved access to input & output markets (TOTAL)



Number of persons reached/trained with improved technology and skills



Number of trained farmers in sustainable agricultural production & practices



Number of companies with support plan to invest, trade or provide service

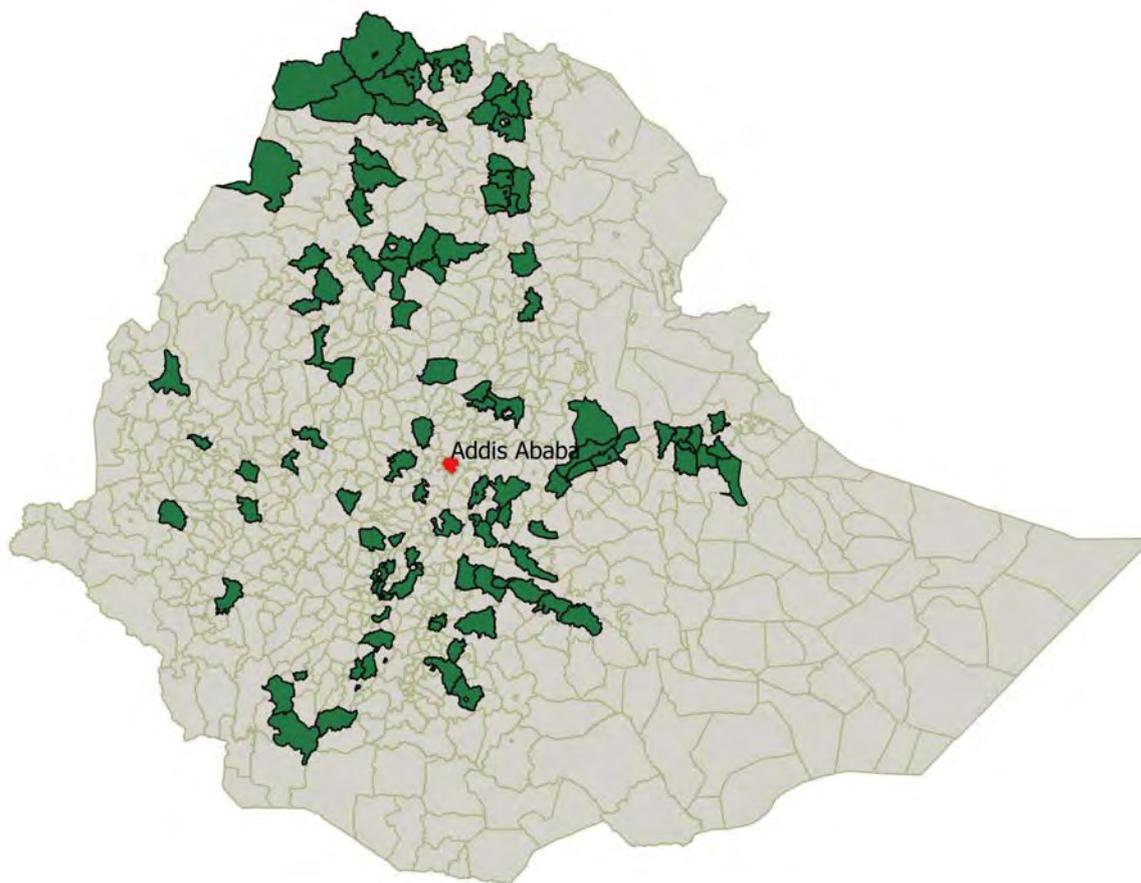


Number of substantial policy changes/reforms contributed to









Executive summary

Introduction

The Integrated Seed Sector Development programme in Ethiopia (ISSD) works to ensure the sustainable increase of agricultural productivity due to improved access to and use of quality seed of new, improved, and/or farmer preferred varieties by men and women smallholder farmers. Increased availability and use of quality seed; enhanced performance of seed value chains; and an improved enabling environment for the seed sector are outcomes that contribute to this impact. The availability and use of quality seed of new, improved and/or farmers preferred varieties is increased by providing support to informal seed producing groups largely through the deployment of a large number of improved and local varieties; by strengthening seed producer cooperatives (SPCs), private seed producers (PSPs), and public seed enterprises to become more market-oriented in their seed production, marketing and distribution; and by facilitating conditions for Dutch/international seed companies to invest in Ethiopia. By piloting interventions in partnership with stakeholders, ISSD alleviates bottlenecks hampering the performance of seed value chains. Embedding evidence based innovations in regulatory frameworks and putting them into practice, ISSD improves the enabling environment of the seed sector. ISSD operates in four agriculturally important regional states of Ethiopia. Implementing partners of ISSD Ethiopia are Bahir Dar University in Amhara, Haramaya University and Oromia Seed Enterprise in Oromia, Hawassa University in SNNPR and Mekelle University in Tigray. Technical and administrative assistance is delivered by the Wageningen Centre for Development Innovation (WCDI).

Major achievements

- Direct support given to 26,309 individual seed producers including 15,661 participants in PVS and crowdsourcing; 73 SPCs; 16 PSPs; four PSEs; and several international breeding companies;
- Selected SPCs and PSPs produced 21,268 t of quality seed of grains, legumes and oilseeds; 1,090 t of seed potatoes; 65,500 mango, avocado, papaya and lemon tree seedlings and 3,120,000 sweet potato cuttings;
- 246 t of quality seed harvested from 2019 crowdsourcing trials, which will be shared with 45,000 or more smallholders in 2020;
- 343 varieties of 20 crops deployed across 181 villages in 52 woredas of the country through PVS and crowdsourcing to generate demand for new and improved varieties;
- Crop and variety deployment increased 17.6% and 22.5% respectively since 2018;
- 88% of audited SPCs and 100% of all PSPs recorded profits;
- Improvements in all four regions against our eight KPIs of local seed business achieved;
- 35% of participants in program activities were women;
- Quality seed of 392 varieties of 35 crops became available, thereby making a significant contribution to food and nutrition security and climate resilience in the country;
- Selected seed producers increased the number of crops in their product portfolios to 31, a 19% increase on the previous year;
- Nutrient dense crops including finger millet and quality protein maize; chickpea, common bean, dokoko, faba bean, field pea, lentil, mung bean and soybean; linseed and sesame; orange fleshed sweet potato; avocado, lemon and papaya; and onion, sweet pepper and tomato; deployed through PVS, crowdsourcing and local seed business;
- Over 175 linkages facilitated between seed producers and inputs, services and markets;
- Seed Information Exchange, a digital platform for sharing information on seed availability, expanded to incorporate all four PSEs with the strong encouragement of the State Minister;
- High-level dialogue among SeedNL mission and Ethio-NL Seed Committee on constraints to foreign direct investment in the country chaired by the State Minister;
- Long-awaited directive on Unregistered Varieties, a directive ISSD Ethiopia has advocated will increase foreign direct investment and foreign currency reserves in the country, approved;
- Two joint ventures with Enza Zaden and Rijk Zwaan started;
- Seed core groups supported in establishing their legitimacy as collaborative governance structures in all four regions;
- Innovations in seed value chains addressing bottlenecks in seed sector governance, EGS supply, seed quality assurance and seed marketing scaled;
- 'Transforming the Ethiopian Seed Sector: Issues and Strategies' strategic document published and 700 copies distributed for public reference;
- 24 MoA staff members informed by the State Ministers to incorporate these strategies in their new multi-annual plan;
- Panel finalizing the draft national seed policy chaired by ISSD Ethiopia;
- Amendments to the 2013 Seed Proclamation prepared;
- Technical contributions given in the development of the draft Plant Breeders' Right Regulation;
- New plans for EGS production and marketing in 2019/20 developed and contractual agreements signed;
- Agreement to incorporate new EGS producers, including capable private entities, reached;
- ESA backed in their advocacy to address identified policy constraints to private sector in the new draft seed policy;
- Internal systems of planning, monitoring and evaluation improved in 2019 through introduction of impact reporting in existing grant canvases;
- Grading tool developed to assist staff in selecting high potential seed producers with which to work in 2020;
- A multitude of new news items published, which can be read on our website: www.ISSDethiopia.org;
- Malt barley value chains strengthened in Amhara, SNNPR and Tigray in collaboration with CASCAPE;
- Potato value chains strengthened in Amhara and Oromia in collaboration with CASCAPE and REALISE;
- Sesame value chains strengthened in north-west Ethiopia in collaboration with CASCAPE and SBN;
- Soybean value chains strengthened in Oromia in collaboration with CASCAPE;

- Collaboration with EIAR, RARIs, Bahir Dar, Haramaya and Mekelle universities and offices of agriculture reached over 20,000 new participants in crowdsourcing;
- Collaboration with GIZ strengthened local seed business in Oromia;
- Collaboration with AGP helped scale DSM to 313 woredas and upgrade 25 CIGs to SPC level.

Major challenges, opportunities, lessons learnt and way forward

Challenges

- Short supply of quality early generation seed (EGS);
- Limited competencies of seed producers in business management and marketing;
- Constraints in capital and a lack of investment in seed business;
- Poor access to credit and crop insurance;
- Poor service delivery to SPCs in areas including auditing, utilities and machinery hire;
- Rivalry and strained relationships between SPCs and unions;
- Lack of commitment of certain partners and high rates of staff turnover in public institutions and the regional seed core groups;
- Weak coordination among seed value chains actors;
- Interference of local offices of agriculture in contractual seed production in Amhara;
- Over-regulation of seed marketing, particularly in oppressing seed prices;
- Low sensitivity of partners towards gender and nutrition;
- Limited implementation capacity of MoA;
- Weak structure to how the seed sector is governed and a lack of leadership;
- Upcoming elections and change of government;
- Attention given to seed sector challenges is parochial and neither strategic nor effective in addressing root causes of underperformance;
- Integration among BENEFIT partners in product and place is limited;
- Already ambitious targets and expectations raised among stakeholders compete for time and resource allocation to collaborative activities;
- High staff turnover in public institutions and the generally intensive nature of maintaining warm relations with stakeholders demands time of our staff that could have been diverted elsewhere.

Opportunities

- Growing demand for quality seed by smallholders and commercial farmers alike;
- Expansion of direct seed marketing and seed retail networks across the country;
- Tax rebate on agricultural machinery import;
- Support for crowdsourcing in seed extension from offices of agriculture;
- Increased capacity and demand for commodities of agro-industrial parks and expansion of agricultural commercialization clusters;
- Investment in seed quality assurance, including laboratories;
- Guideline on contractual seed production available in Amhara region;
- Directive for contract farming drafted and expected to be endorsed;
- Government and donor interest in the seed sector;
- Concentration of efforts of development initiatives in the seed sector, including AGP; ATA; AGRA; USAID; GIZ; and CGIAR and EIAR;
- High recognition at regional states and federal levels of the achievements of and willingness to partner with ISSD Ethiopia;
- Endorsement of seed sector transformation agenda;
- Government's commitment towards improving Ethiopia's rank in the World Bank's Enabling the Business of Agriculture index;
- Increasing call for foreign direct investment in Ethiopia;
- As BENEFIT comes to an end and the focus is shifting towards documenting and sharing lessons, there is potential to join efforts in institutionally imbedding innovations in Ethiopia.

Lessons learnt

- Increased collaboration with agricultural research institutes bolstered our achievements in variety deployment and crop and variety portfolio diversification;

- Seed exchange through the social networks of in particular women farmers enhanced our efforts to deploy varieties through crowdsourcing;
- Focussing on quality and not quantity avoids diminishing rates of return on investment in local seed business;
- Fostering B2B relations between SPCs and unions offers potential breakthrough for local seed business development;
- Women and men farmers' differences in preferences for crops, varieties and seed products arise from their division of labour in the household and community, which warrants understanding;
- Involvement of seed producers and retailers in seed demand assessment improves the reliability of seed demand forecasts and reduces rates of carryover seed;
- There is significant demand for the Seed Information Exchange from the MoA, yet agreement on the rules of information sharing and responsibilities in data management still has to be reached;
- Inclusive multi-stakeholder dialogues improves seed value chain coordination and integration;
- Contractual EGS production concept accepted, but increased attention to accountability still needs to be given;
- Stakeholders need to embrace systemic change in order to achieve breakthrough in transforming the seed sector;
- Systemic change has to be managed inclusively and adaptively;
- Investment in social capital pays off considerably, but systemic change is a long game;
- The success of the portfolio as a whole is a result of strong collaboration bilaterally between Ethiopia and the Netherlands, among government, industry, science and civil society in and between both countries, and across the various value chains in Ethiopia, from production to consumption.

The way forward

- Institutionally embed crowdsourcing as common practice within the institutions of research and extension by further facilitating important dialogue in 2020;
- Continue to invest in quality and not quantity when it comes to seed producers or risk diminishing returns on investment;
- Consolidate capacities of selected high potential SPCs and PSPs;
- Foster B2B relations between SPCs and unions to avoid rivalry, enhance synergy and improve the viability of local seed business models in Ethiopia;
- Expand the coverage of the Seed Information Exchange and agree on the rules and responsibilities in data management;
- Strengthen seed sector governance by giving structure to mandated responsibilities in coordinating and regulating activities in the seed sector;
- Improve accountability mechanisms in the contractual supply of quality EGS in the country;
- Strengthen seed sector governance by giving structure to mandated responsibilities in coordinating and regulating activities in the seed sector;
- Ensure that the strategies of the transformation agenda are incorporated in government's multi-annual plans at federal and regional state levels;
- Promote a better understanding and internalization of the strategies proposed among multiple stakeholders;
- Strengthen government's capacities to lead, coordinate and regulate transformation in the seed sector;
- Invest considerably in the seed regulatory services of phytosanitation and quarantine, variety registration and seed quality assurance;
- Document and share lessons learnt and join efforts within BENEFIT to institutionally embed innovations in Ethiopia.

Quality and quantity of sustainable agricultural production

Since 2016, the availability and use of quality seed of over four million farmers has improved as a result of ISSD Ethiopia's interventions. In 2019, direct support was given to 26,309 individual seed producers. These include: 15,661 participants in participatory variety selection (PVS) and crowdsourcing; 73 seed producer cooperatives (SPCs); 16 small- and medium-sized private seed producers (PSPs); four public seed enterprises (PSEs); and several international breeding companies. Selected SPCs and PSPs produced 21,268 tonnes (t) of quality seed of grains, legumes and oilseeds; 1,090 t of seed potatoes; 65,500 mango, avocado, papaya and lemon tree seedlings and 3,120,000 sweet potato cuttings. 343 varieties of 20 crops were deployed across 181 villages in

52 woredas of the country through PVS and crowdsourcing to generate demand for new and improved varieties. ISSD Ethiopia supported seed producers are profitable. 88% of audited SPCs and 100% of all PSPs reported profits last year. Looking at other key performance indicators (KPIs), improvements across all four regions are observed. Women's participation in the program has more than doubled since 2016 to 35% of all farmers that received support in 2019. Through ISSD Ethiopia interventions, quality seed of 392 varieties of 35 crops became available, thereby making a significant contribution to food and nutrition security and climate resilience in the country.

Improved markets and trade

Over 175 linkages between seed producers and inputs, services and markets were facilitated in 2019. The Seed Information Exchange, a digital platform for sharing information on seed availability, has been expanded in its piloting to incorporate all four PSEs in the country with the strong encouragement of the State Minister for Agricultural Input and Output Marketing. A program for a SeedNL mission of Dutch delegates from the ministries of Foreign Affairs and Agriculture and breeding companies East-West Seed and Limagrains-Hazera to Ethiopia was organized including high-level dialogue on constraints to foreign direct investment in the country among members of the Ethio-NL Seed Committee, which was chaired by the State Minister of Agricultural Development and Policy. The long-awaited directive on Unregistered Varieties, a directive ISSD Ethiopia has advocated will increase foreign direct investment and foreign currency reserves in the country, was finally approved and two joint ventures with Enza Zaden and Rijk Zwaan have started. Lastly, innovations in seed value chains addressing bottlenecks in seed sector governance, EGS supply, seed quality assurance and seed marketing were scaled in 2019. We observe several examples of increased public expenditure in the seed sector, including the recent establishment of the Oromia Agricultural Input Regulatory Authority (OAIRA), which brings the total number of independent seed regulatory authorities in the country to three; construction of new seed laboratories and upgrades to existing ones; and investment in seed marketing infrastructure.

Improved enabling environment

ISSD Ethiopia facilitated a consultative process that led to the publication of the strategic document 'Transforming the Ethiopian Seed Sector: Issues and Strategies'. The document (henceforth referred to as the transformation agenda) is a stakeholder-owned and MoA endorsed strategic agenda for the seed sector. 24 MoA staff members have been presented the document and informed by the State Ministers to incorporate its strategies in their new multi-annual plan. ISSD Ethiopia chaired the panel finalizing the draft national seed policy; has prepared amendments to the 2013 Seed Proclamation; contributed in the development of the draft Plant Breeders' Right Regulation; and is an active participant in the National Seed Advisory Group. ISSD Ethiopia collaborated in the Netherlands Enterprise Agency (RVO)-funded Institutional Mapping and Capacity Needs Assessment of Ethiopia's Public Seed Sector Services, and takes the study's recommendations on board. In 2017, the program was handed the mandate by MoA to systematize EGS supply in the country and organized a series of meetings in 2019 to monitor and evaluate the progress made to date. New plans for EGS production and marketing in 2019/20 have been developed and contractual agreements signed. ESA was backed in their advocacy to address identified policy constraints to private seed sector development in the new draft seed policy.

Partnership and collaboration

Internal systems of planning, monitoring and evaluation have been improved in 2019. Impact reporting on the vast number of investments made by ISSD Ethiopia has commenced through the use of updated grant canvasses. A grading tool has been developed to assist staff in selecting high potential seed producers to work with in 2020. A multitude of new news items published, which can be read on our website: www.ISSDethiopia.org. In collaboration with BENEFIT partners, the value chains of malt barley, potato, sesame and soybean have been strengthened at various locations across the country. Collaboration with EIAR, RARIs, Bahir Dar, Haramaya and Mekelle universities and offices of agriculture reached over 20,000 new participants in crowdsourcing. Collaboration with GIZ has strengthened local seed business in Oromia. DSM has been scaled to 313 woredas across the country and 25 CIGs have been upgraded to SPC level as a result of our partnership with AGP. Together with Bioversity International, we have developed the Seed Information Exchange in response to strong demand from MoA and the State Minister herself.

Quality and quantity of sustainable agricultural production

Increased availability and use of quality seed of new, improved and farmer preferred varieties

Since 2016, the availability and use of quality seed of over four million farmers has improved as a result of ISSD Ethiopia's interventions. In 2019, direct support was given to 26,309 individual seed producers. These include: 15,661 participants in participatory variety selection (PVS) and crowdsourcing; 73 seed producer cooperatives (SPCs); 16 small- and medium-sized private seed producers (PSPs); four public seed enterprises (PSEs); and several international breeding companies. Selected SPCs and PSPs produced 21,268 tonnes (t) of quality seed of grains, legumes and oilseeds; 1,090 t of seed potatoes; 65,500 mango, avocado, papaya and lemon tree seedlings and 3,120,000 sweet potato cuttings. 343 varieties of 20 crops were deployed across 181 villages in 52 woredas of the country through PVS and crowdsourcing to generate demand for new and improved varieties. ISSD Ethiopia supported seed producers are profitable. 88% of audited SPCs and 100% of all PSPs reported profits last year. Looking at other key performance indicators (KPIs), improvements across all four regions are observed. Women's participation in the program has more than doubled since 2016 to 35% of all farmers that received support in 2019. Through ISSD Ethiopia interventions, quality seed of 392 varieties of 35 crops became available, thereby making a significant contribution to food and nutrition security and climate resilience in the country.

Increased production and dissemination/marketing of quality seed

With ISSD Ethiopia support in 2019, 73 SPCs and 16 PSPs produced 21,268 t of quality seed of grains, legumes and oilseeds (Figure 1a); 1,090 t of seed potatoes (Figure 1b); 65,500 mango, avocado, papaya and lemon tree seedlings and 3,120,000 sweet potato cuttings. The decline observed in Figure 1 from 2018 to 2019 is a result of our reduced support to roughly half the number of seed producers of previous years. Not taken into account here above is 246 t of quality seed that was harvested from 2019 crowdsourcing trials. We anticipate that this will be shared with 45,000 or more smallholders in 2020. Also not considered is seed saved from previous years of PVS and crowdsourcing that is still being recycled and exchanged informally today. Seed of preferred varieties selected from PVS and crowdsourcing trials in 2018 was multiplied on relatively large plots of land in 2019. For instance, on 25 ha of clustered land in Boji Chekorsa, Boset and Sayo woredas of Oromia regional state, 174 farmers recycled seed that they harvested in 2018 of their preferred varieties. This includes seed of the preferred common bean; teff and wheat varieties: SER 129, Deme, Nasir and Dendessu; Boset and Kuncho; and Sanate, Dende'a, Liben and Ogolcho respectively. In SNNPR, eight woreda offices of agriculture assisted cluster-based seed multiplication of 19 preferred varieties of common bean, faba bean, finger millet, sorghum, teff and wheat on 145 ha of land. In Tigray, Melkam sorghum variety was multiplied on 1,042 hectare of land by 1,122 farmers, and large volumes of seed of Fetina, Felamit and Hirty barley varieties were multiplied in Degua Temben woreda as well.

The total number of seed producers in the country in possession of a certificate of competence (CoC), a license to operate essentially, has increased tremendously as a result of the program's interventions. These include SPCs, seed unions and small- and medium-sized PSPs in addition to the already well established PSEs and large private companies that have been operating in Ethiopia for many years now. At the beginning of 2012 when ISSD Ethiopia commenced its first phase, not a single PSP in SNNPR and Tigray was in possession of a CoC. By the end of 2019, 34 PSPs and seed unions have obtained CoCs in SNNPR and 25 in Tigray. ISSD Ethiopia's mission to promote pluralism in the seed sector, notably also in terms of its support to a wide range of seed producers, has not only increased, but also diversified the seed available in the market and within a relatively short distance from the smallholder.

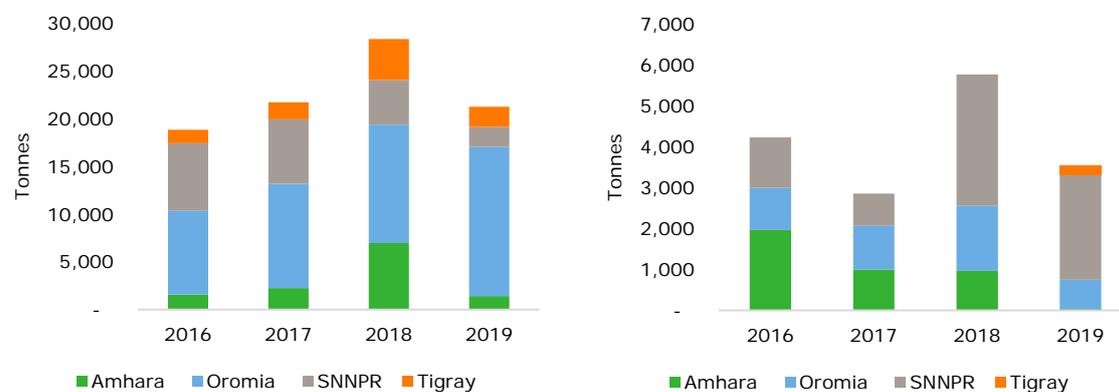


Figure 1a Quality seed of grains, legumes and oilseeds produced from 2016-19 **Figure 1b** Quality seed potatoes produced from 2016-19

The abovementioned achievements are the result of a number of support services offered by ISSD Ethiopia to seed producers and their partners. Support services in 2019 included: building technical capacity in quality seed production, processing, packaging, storage, marketing and distribution through training, coaching and follow up; enhancing organizational and financial management through training, coaching and follow up; facilitating learning and inspiring entrepreneurship through knowledge and experience sharing; co-funding innovation in the form of asset procurement and infrastructural upgrades; building relationships with important input and service providers; and scaling and embedding innovations institutionally in Ethiopia. Other specific outputs in 2019 included:

- 15,661 crowdsourcing participants including 7,384 women; 3,579 SPC members including 84 committee members; and 339 experts from unions and other partner organizations trained in sustainable production and post-harvest handling practices in quality seed management;
- 366 PICS- and GrainPro-bags demonstrated to 25 SPCs and 6 PSPs in Tigray to reduce post-harvest losses;
- 24 farmers from four recently established SPCs from what were previously common interest groups (CIGs) of the Agricultural Growth Program (AGP) in Oromia (south & west) trained on techniques of quality seed production and on seed quality control;
- 18 of 21 CIGs recently upgraded to SPC status in Tigray obtained access to basic seed;
- 15 partners in local seed business (LSB) coached in their facilitation skills development;
- € 39,812 co-invested in 21 SPCs in the procurement of furniture; fencing; and small seed packs and construction of offices; stores; shelter for farm machinery; and a screening house for disease free potato mini-tuber production and € 55,078 transferred to nine partners in LSB for similar co-investments in SPCs;
- € 16,365 co-invested in three PSPs in store construction; processing; and packaging seed in small seed packs.

Increased demand for and availability of new, improved and/or farmer preferred varieties

In 2019, 343 varieties of 20 crops were deployed to 15,661 smallholders, including 7,384 women, across 181 villages in 52 woredas of the country through PVS and crowdsourcing. This marks a 17.6% increase in crop and 22.5% increase in variety deployment compared to our efforts in 2018 (Figure 2). Among the 343 are 290 varieties currently not incorporated in the portfolios of supported SPCs and PSPs, making PVS and crowdsourcing an important means to introduce varieties that farmers are not familiar with. Seed of most of these varieties were collected from agricultural research centres (ARCs), but several local varieties were evaluated also. Last year 134 PVS trials were conducted across the country, which, coupled with field days at the sites of crowdsourcing, drew 5,672 visitors. In addition, field days organized by SPCs and PSPs to promote their products drew 679 farmers and partner organizations.

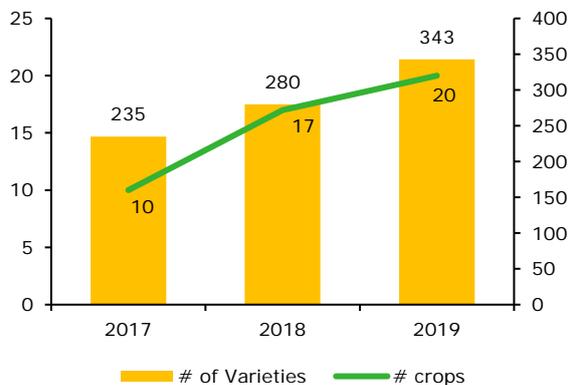


Figure 2 Crops and varieties deployed through PVS and crowdsourcing from 2017-19

Crowdsourcing has proven important in introducing new and improved varieties to a large number of farmers and creating demand among them for quality seed of their preferred varieties. The extension directorate of the regional state Bureaus of Agriculture (BoAs), and in particular development agents (DAs) and extension staff of woreda offices of agriculture, appreciate the approach as a result. Researchers also appreciate how efficient crowdsourcing is in generating large datasets on farmers' varietal preferences, which informs their crop improvement programs. For technology development and deployment, crowdsourcing offers tremendous potential also as a link between research and extension in Ethiopia.

In order to increase demand for new and improved varieties, ISSD Ethiopia applies a multifaceted approach. Methods used include seed extension; PVS and crowdsourcing; demonstrations; participatory monitoring and evaluation; field days; food fairs; seed mini-markets and exhibitions; and mass media broadcasting including radio, television, and printed brochures, flyers and newsletters. Other specific outputs in 2019 included:

- 48 professionals including 22 breeders; 11 seed experts and agronomist employed in REALISE; and 15 in ISSD Ethiopia trained on the Tricot methodology to crowdsourcing and ClimMob3 platform for data entry and analysis;
- 83 participants drawn from SPCs; unions; zone offices of agriculture and cooperative promotion; universities; research centres; and CARE trained on PVS and crowdsourcing in Oromia (east);
- € 164,365 invested in strengthening the capacity of 41 partners to scale and institutionally embed crowdsourcing as a common approach to their research and extension practices.

Enhanced business orientation and financial viability of seed producers

Almost all ISSD Ethiopia supported seed producers are profitable local seed businesses. Among those SPCs that were audited in 2019, 88% were profitable. In addition, all 16 of the PSPs to which ISSD Ethiopia extended its support in 2019 provided audit reports or income statements indicating profit. Figure 3 displays the trend in profitability over the past four years. Looking at other key performance indicators (KPIs), improvements across all four regions are observed in 2019 (Figure 4). Average scores for the KPIs of technically-equipped; market-oriented; professionally-organized; strategically-linked have improved by 9.6%; 9.3%; 5.6%; and 4.2% respectively for SPCs, and by 8.5%; 7.5%; 6.3%; and 10.10% respectively for PSPs. Where seed producers still need to improve their performance are in the areas of value addition, marketing and financial management.

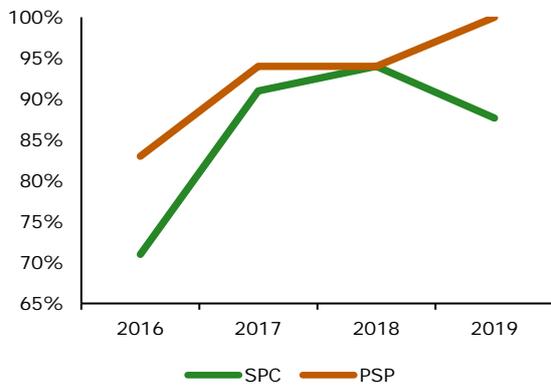


Figure 3 Proportion of audited seed producers profitable in their seed business

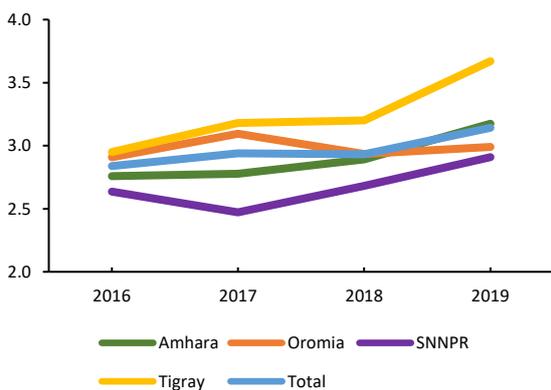


Figure 4a Average KPI scores (1 (weak) – 5 (excellent)) of SPCs from 2016-19

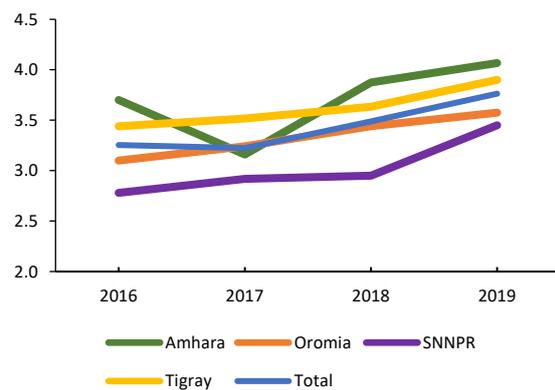


Figure 4b Average KPI scores (1 (weak) – 5 (excellent)) of PSPs from 2016-19

Various efforts have been made to enhance the business orientation of selected seed producers in Ethiopia through similar means of capacity strengthening described in 1.1.1 above, but in related topics of business administration. Whilst a lot can be done to strengthen the business operations of these organizations, a number of challenges are systemic in nature. In 2019, a good deal of effort has been made to foster better and more business-to-business (B2B) relations between SPCs and unions. Whilst still in the process of finalizing reports from each regional unit on the discussions and training held with SPCs, unions, and important development partners including ATA, different and more mutually beneficial relationships have been identified, described and promoted. A typology of these relationships will be documented and applied in tailoring our support to selected SPCs in consolidating LSB development in 2020. The LSB approach has now been taken up in several seed-related development projects, including those of ATA (cooperative-based seed production (CBSP)); GIZ (Supporting Sustainable Agricultural Productivity (SSAP) and Green Innovation Centre (GIC)); and even Holeta ARC of EIAR.

Other specific outputs in 2019 include

- 80 SPC committee members; 32 investor farmers; and 15 partners in local seed business trained on KPI assessment;
- 415 SPC committee members and 15 partners in local seed business trained and coached for skills development in leadership; business planning; financial management; and marketing;
- 11 SPCs in East and West Hararghe zones, Oromia provided format and coaching to amend their cooperative bylaws in cooperation with zone and woreda offices of cooperative promotion;
- 15 participants from woreda offices of cooperative promotion and partners in local seed business trained on newly amended SPC bylaws in Oromia (south & west);
- Six PSPs updated their business plans and developed new marketing strategies in Tigray;

- 368 members of 71 SPCs and 33 partners in local seed business obtained cash books, manuals and related financial literacy training in Oromia and Tigray regions;
- 73 SPCs and 16 PSPs assessed in terms of their potential to grow their businesses using a newly developed grading tool for local seed business and 25 high potential seed producers selected for continued support from the program in 2020;
- Training materials on fostering B2B relations between SPCs and unions developed and shared during dialogue facilitated by ISSD Ethiopia's Program Management Unit (PMU);
- Sertan Endeg SPC of Amhara visited Avola Goshaye, a local seed business that graduated at the end of the previous phase of the program, which has helped the SPC operationalize its seed cleaning machine;
- 200 packs of 0.5 kg and 125 packs of 2 kg onion seed sold by one PSP directly to farmers in Tigray;
- More than 150 farmers including 60 women purchased seed of their preferred varieties in packages ranging from 2-5 kg in Oromia (east).

Women have improved access and use of quality seed of their preference at household and community level in informal seed systems

Women's participation in the program has quadrupled since 2016 (Figure 5). In 2019, 35% of participants in program activities were women. 7,384 women participants in crowdsourcing were trained in trial management, variety evaluation and seed selection and storage. It is anticipated that they will share the seed they harvested with over 22,000 others. According to a seed tracer study conducted in Oromia (east), women-to-women exchange increased the availability and use of quality seed of the varieties most preferred by women. In Meta woreda for example, the study revealed that seed harvested by women was exchanged as widely as across three kebeles.

Having applied a gender-sensitive approach to variety deployment and evaluation, ISSD Ethiopia has discovered multiple differences in the preferences of women and men towards crops, varieties and value-added seed products. We also observe a gendered division of labour in seed and crop production in the household and community. This warrants a better understanding of how individual preferences relate to how tasks are divided between women and men in order to better cater to the needs of women specifically.

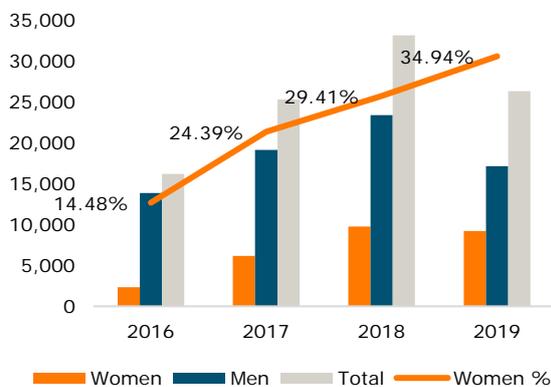


Figure 5 Women's participation in ISSD Ethiopia in general (bars) and as proportion of total participants (line)

Other specific outputs in 2019 include

- 58 women farmers trained on leadership and management, 42 of which have taken up positions;
- 51 women participants in crowdsourcing elected to cluster committees in 14 woredas in Oromia (south & west) to manage informal seed multiplication efforts;
- Staff of partner organizations trained on gender sensitivity and gender rapid assessment;
- Gender gap analysis conducted in potato growing areas to identify challenges of potato production for women and men;

- 50 women farmers in Jarso and Dader woredas of Oromia (east) trained in quality seed potato production and distributed quality starting material in collaboration with REALISE;
- 60 women farmers accessed seed of their preferred varieties in their preferred small package sizes of 2-5 kg at affordable prices, sold by SPCs in Oromia (east);
- 769 women farmers accessed quality seed of important leguminous crops for household and in particular women's nutrition including chickpea; common bean; faba bean; field pea; and lentil;
- Women's preferred varieties and traits documented and shared through different communication channels and women-managed trials visited ubiquitously during field days.

Improved food and nutrition security of farmers through increasing crop and variety diversity

Through ISSD Ethiopia-led interventions in 2019, quality seed of 392 varieties of 35 crops became available (Figure 6). Described in 1.1.2 above, our efforts in PVS and crowdsourcing contributed to this. In addition, ISSD Ethiopia-supported seed producers increased the number of crops in their product portfolios to 31, a 19% increase on the previous year. Quality seed of 96 varieties was multiplied by selected SPCs and PSPs in 2019. With a total of 12, bread wheat accounted for the most varieties by crop type. Further, the largest number of varieties were produced by SPCs in Oromia, whilst Tigray contributed the greatest share of the diversity incorporated in the collective product portfolio of PSPs (Figure 7).

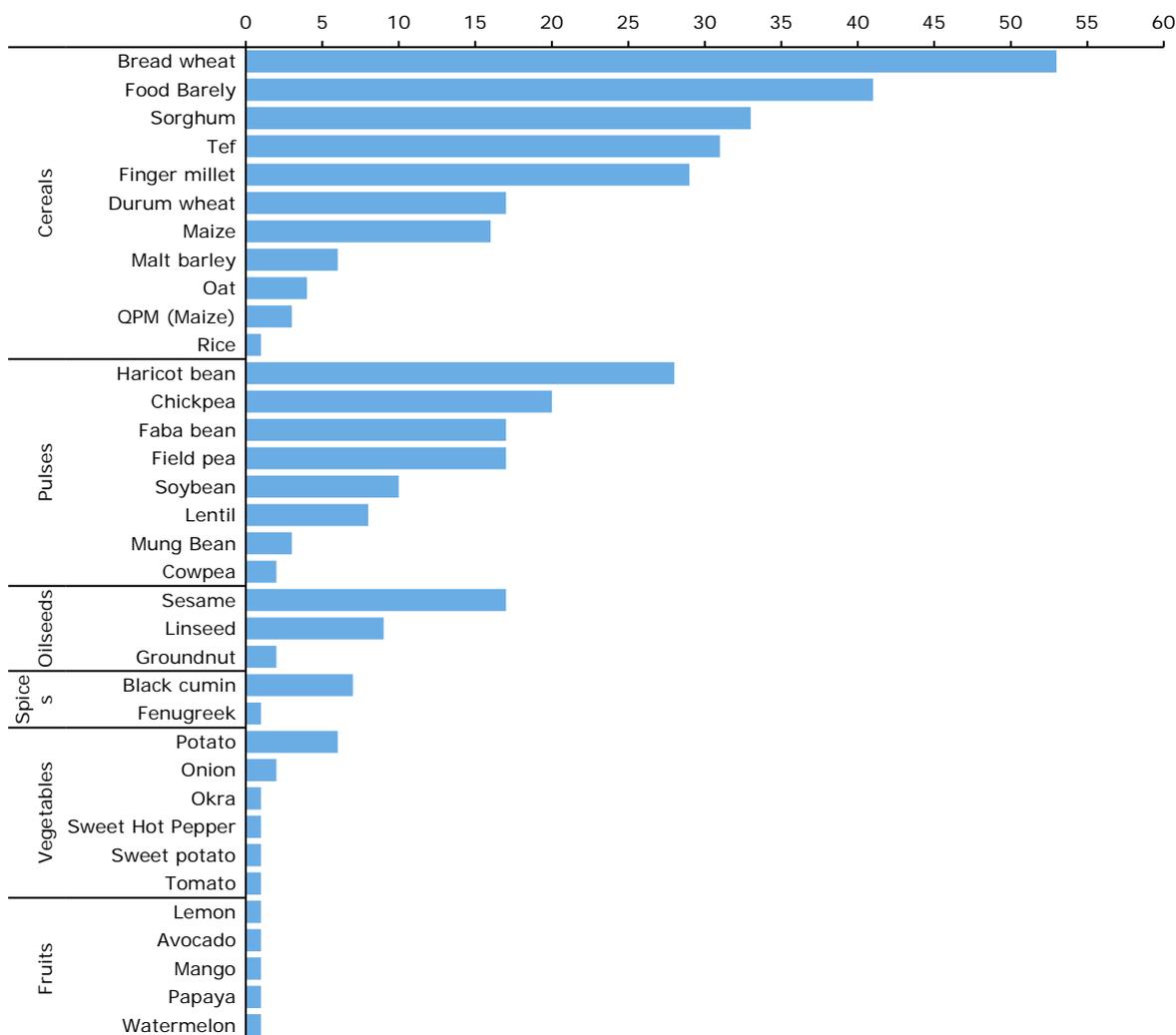


Figure 6 Total number of varieties and crops incorporated in ISSD Ethiopia interventions in 2019

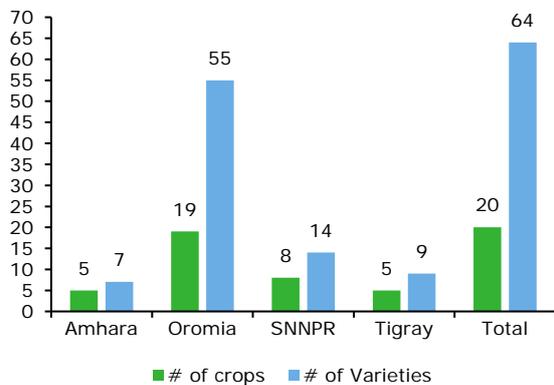


Figure 7a Number of crops and varieties for which quality seed was produced by SPCs in 2019

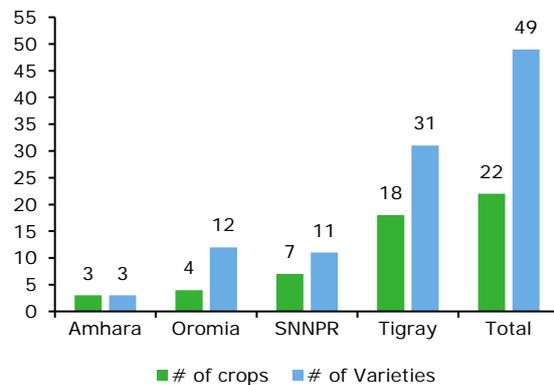


Figure 7b Number of crops and varieties for which quality seed was produced by PSPs in 2019

ISSD Ethiopia supported partners and participants in PVS and crowdsourcing and selected SPCs and PSPs to diversify their and their communities' farming systems in terms of crops and varieties. We strongly believe that this enhanced diversity contributes positively and meaningfully to the improved food and nutrition security and climate resilience of farmers. The extent to which ISSD Ethiopia has promoted seed production of grain legumes has also had a positive outcome for the soil fertility of not only the seed producers we work with, but their clients as well. Other specific outputs in 2019 included:

- Nutrient dense crops including finger millet and quality protein maize; chickpea, common bean, dokoko, faba bean, field pea, lentil, mung bean and soybean; linseed and sesame; orange fleshed sweet potato; avocado, lemon and papaya; and onion, sweet pepper and tomato; deployed through PVS, crowdsourcing and local seed business;
- 110 farmers, 70% of which were women, participated in food fairs and nutrition education in Meta woreda, Oromia (east);
- 5,500 farmers participated in nutrition awareness creation and field days in Oromia (south & west).

Mainstreaming social inclusion and nutrition

ISSD Ethiopia's pluralistic approach to increase the availability and use of quality seed of new, improved and/or farmer preferred varieties considers different groups in society including women; men; the youth; farmers with small-, medium- and large-holds of land; both producers and consumers of seed in informal, intermediary and formal seed systems; and producers of food and cash crops. In addition, we take nutrition security on board as an intermediary outcome. Fundamental to ISSD Ethiopia's strategy to mainstreaming nutrition is diversifying the crop and variety portfolio for which quality seed is available. In addition, specific attention was given more than ever to include nutrient dense crops in our variety deployment efforts.

Given the disenfranchised position of women in agriculture in Ethiopia, ISSD Ethiopia committed to a target of 50% participation in interventions in informal seed systems, which it achieved. In fact, participation of women in the program in general reached 35% in 2019, which is more than double that of 2016. To improve women's participation in local seed business, efforts included training on gender, awareness raising and advocacy for, among other topics, amendment of cooperative bylaw to encourage increased women's equity in the business in general and participation at management level in particular. Another way in which ISSD mainstreams gender is that it gives a balanced representation of men and women in the demonstrations it organizes and news items it publishes.

Achievements

- Direct support given to 26,309 individual seed producers including 15,661 participants in PVS and crowdsourcing; 73 SPCs; 16 PSPs; four PSEs; and several international breeding companies;
- Selected SPCs and PSPs produced 21,268 t of quality seed of grains, legumes and oilseeds; 1,090 t of seed potatoes; 65,500 mango, avocado, papaya and lemon tree seedlings and 3,120,000 sweet potato cuttings;

- 246 t of quality seed harvested from 2019 crowdsourcing trials, which will be shared with 45,000 or more smallholders in 2020;
- 343 varieties of 20 crops deployed across 181 villages in 52 woredas of the country through PVS and crowdsourcing to generate demand for new and improved varieties;
- Crop and variety deployment increased 17.6% and 22.5% respectively since 2018;
- 88% of audited SPCs and 100% of all PSPs recorded profits;
- Improvements in all four regions against our eight KPIs of local seed business achieved;
- 35% of participants in program activities were women;
- Quality seed of 392 varieties of 35 crops became available, thereby making a significant contribution to food and nutrition security and climate resilience in the country;
- Selected seed producers increased the number of crops in their product portfolios to 31, a 19% increase on the previous year;
- Nutrient dense crops including finger millet and quality protein maize; chickpea, common bean, dokoko, faba bean, field pea, lentil, mung bean and soybean; linseed and sesame; orange fleshed sweet potato; avocado, lemon and papaya; and onion, sweet pepper and tomato; deployed through PVS, crowdsourcing and local seed business.

Challenges, opportunities and lessons learnt

- Short supply of quality early generation seed (EGS);
- Limited competencies of seed producers in business management and marketing;
- Constraints in capital and a lack of investment in seed business;
- Poor access to credit and crop insurance;
- Poor service delivery to SPCs in areas including auditing, utilities and machinery hire;
- Rivalry and strained relationships between SPCs and unions;
- Growing demand for quality seed by smallholders and commercial farmers alike;
- Expansion of direct seed marketing and seed retail networks across the country;
- Tax rebate on agricultural machinery import;
- Support for crowdsourcing in seed extension from offices of agriculture;
- Increased collaboration with agricultural research institutes bolstered our achievements in variety deployment and crop and variety portfolio diversification;
- Seed exchange through the social networks of in particular women farmers enhanced our efforts to deploy varieties through crowdsourcing;
- Focussing on quality and not quantity avoids diminishing rates of return on investment in local seed business;
- Fostering B2B relations between SPCs and unions offers potential breakthrough for local seed business development;
- Women and men farmers' differences in preferences for crops, varieties and seed products arise from their division of labour in the household and community, which warrants understanding.

Way forward

- Institutionally embed crowdsourcing as common practice within the institutions of research and extension by further facilitating important dialogue in 2020;
- Continue to invest in quality and not quantity when it comes to seed producers or risk diminishing returns on investment;
- Consolidate capacities of selected high potential SPCs and PSPs;
- Foster B2B relations between SPCs and unions to avoid rivalry, enhance synergy and improve the viability of local seed business models in Ethiopia.

Improved markets and trade

Enhanced performance of seed value chains

Over 175 linkages between seed producers and inputs, services and markets were facilitated in 2019. The Seed Information Exchange, a digital platform for sharing information on seed availability, has been expanded in its piloting to incorporate all four PSEs in the country with the strong encouragement of the State Minister for Agricultural Input and Output Marketing. A program for a SeedNL mission of Dutch delegates from the ministries of Foreign Affairs and Agriculture and breeding companies East-West Seed and Limagrain-Hazera to Ethiopia was organized including high-level dialogue on constraints to foreign direct investment in the country among members of the Ethio-NL Seed Committee, which was chaired by the State Minister of Agricultural Development and Policy. The long-awaited directive on Unregistered Varieties, a directive ISSD Ethiopia has advocated will increase foreign direct investment and foreign currency reserves in the country, was finally approved and two joint ventures with Enza Zaden and Rijk Zwaan have started. Lastly, innovations in seed value chains addressing bottlenecks in seed sector governance, EGS supply, seed quality assurance and seed marketing were scaled in 2019. We observe several examples of increased public expenditure in the seed sector, including the recent establishment of the Oromia Agricultural Input Regulatory Authority (OAIRA), which brings the total number of independent seed regulatory authorities in the country to three; construction of new seed laboratories and upgrades to existing ones; and investment in seed marketing infrastructure.

Strengthened strategic linkages between seed producers and input and service providers

In 2019, 36 SPCs; 10 unions; and seven PSPs were linked by the program to sources of quality early generation seed/starting material including ARCs; universities; PSEs; and farmers' cooperative unions. Among these are PSPs in Tigray multiplying high-yielding hybrid sorghum varieties. Two PSPs in Tigray and a SPC and PSP in Amhara have been linked to in vitro plant tissue culture facilities of the Tigray Biotechnology Centre and Amhara Agricultural Research Institute (ARARI) for disease-free ginger and sweet potato and disease-free potato plantlets respectively. 13 SPCs and two PSPs renewed or obtained for the first time their CoC in 2019. 11 SPCs and three unions in Oromia (east) obtained seed quality assurance services from the Seed Inspection and Certification Centre at Haramaya University, whilst 18 SPCs and 10 PSPs elsewhere were linked with regional seed regulatory authorities. 15 SPCs, four PSPs and one seed union were linked to financial institutes including savings and credit cooperatives and banks to obtain loans. 20 SPCs have been linked to bulk buyers, like PSEs and unions, and retailers like farm service centres (FSCs).

In 2019, in partnership with Bioversity International, ISSD Ethiopia piloted the Seed Information Exchange with Oromia Seed Enterprise as a tool for stock management and platform for seed stock information sharing. In the third quarter of 2019, the Seed Information Exchange was demonstrated to managers of the three other PSEs of Amhara (ASE), SNNPR (SSE) and Ethiopian Seed Enterprise (ESE); managers of the regional seed regulatory authorities of Amhara, Oromia and SNNPR; and officials from the four regional state BoAs and Ministry of Agriculture (MoA), including the State Minister for Agricultural Input and Output Marketing, W/ro Aynalem Nigusie. Expansion of the pilot commenced with a training of 46 professionals drawn from these organizations at the end of last year.

ISSD Ethiopia facilitated these linkages by building stronger bilateral relationships between seed producers and important inputs and service providers and buyers of quality seed. This was also achieved through improved coordination at local, regional state and federal levels in the form of committees, core groups and platforms. Various communication media and products were explored for sharing information on sources of quality seed. Other specific outputs in 2019 included:

- Five SPCs linked with tractor hire and pesticide suppliers;
- Donation and installation of a seed cleaning machine for Chercher Oda Bultum Union facilitated in Oromia (east);
- Seven SPCs obtained crop insurance through a pilot with two unions in Oromia (east).

Increased business opportunities for seed and seed related services provided in Ethiopia by Dutch/International seed companies

In 2019, much interaction took place with SeedNL, a new initiative of the Dutch government and private sector that looks to explore the joint capabilities of the Dutch Diamond (government, industry, science and civil society) in increasing the availability, access and use of quality seed to sustainably contribute to food and nutrition security and reduced poverty globally. In a joint letter to Dutch parliament by Ministers Kaag and Schouten, Foreign Trade and Development Cooperation; and Agriculture, Nature and Food Quality respectively, Ethiopia was mentioned as a frontrunners for applying the SeedNL agenda in practice. ISSD Ethiopia helped develop a program for a SeedNL mission to Ethiopia that included delegates from the Dutch ministries of Foreign Affairs and Agriculture and the breeding companies East-West Seed and Limagrain-Hazera. As part of the program a high-level convening of the Ethio-NL Seed Committee was organized and chaired by the State Minister of Agricultural Development and Policy, Ato Sani Reddi. During this meeting, representatives from BASF-Nunhems, Enza Zaden, Rijk Zwaan and Syngenta were also present. On the agenda were the most pressing constraints to increased foreign direct investment in the country including costly variety registration procedures, the absence of plant variety protection and limited foreign currency reserves. At the end of 2019, after years of advocacy, the Directive on Unregistered Varieties (for export only), a directive ISSD Ethiopia helped draft, was finally approved. This has immediate positive impact on the current activities of three international companies invested in Ethiopia.

A two-pronged strategy is applied to achieve this intermediary outcome: facilitating B2B relations between international breeding companies and local organizations; and enabling foreign direct investment in the seed sector. Other specific outputs in 2019 included:

- Two PSPs linked with BASF-Nunhems as out-growers of vegetable seeds for export;
- Joint venture with GAWT, the local partner to Enza Zaden, to popularize new tomato and onion hybrid varieties in 16 woredas across Amhara, SNNPR and Tigray;
- Joint venture with Rijk Zwaan to introduce and improve open-field slicing-cucumber cultivation.

Piloted demand driven interventions to address seed value chain bottlenecks

Multiple interventions in seed value chains were scaled in 2019. These aimed to solve common problems in seed sector governance; EGS supply; seed quality assurance; and seed marketing, among other topics. With regards to the latter, ISSD Ethiopia has helped scale direct seed marketing (DSM) to 313 woredas across the country, thereby increasing efficiency in seed distribution marked most notably by the reduction in costly rates of seed carryover in store by as much as 85% in some cases. In all four regions, the seed core groups serve as development think-tanks and we have supported them in establishing their legitimacy as collaborative governance structures as well. Most embedded is the Amhara regional core group, which often leads in initiating, coordinating, monitoring and evaluating efforts to transform the seed sector in the region. Furthermore, an assessment of the seed sector in Amhara resulted in the publication of a book documenting the region's challenges, division of roles and responsibilities as well as strategies for improvement.

ISSD Ethiopia facilitated meetings of the regional seed core groups to get their strategic guidance in scaling and institutionally embedding promising innovations in seed value chains in the country. Together in partnership with others, important stakeholders took the lead in scaling innovations. Progress was appraised, innovations documented and the lessons learnt shared in events, meetings and workshops and through communication channels and products. Where required, ISSD Ethiopia both technical and financial assisted in the process. Other specific outputs in 2019 included:

- Contractual agreements in EGS production facilitated, witnessed, monitored and wherever possible enforced with the objective of overcoming shortages in supply in all four regions;
- € 21,250 co-invested in strengthening the seed quality assurance capacities of the three seed regulatory authorities in Amhara, Oromia and SNNPR;
- Four farmers' cooperative unions (Erer, Arfan Kalo, Chercher Oda Bultum and Burka Galati) piloted seed demand forecasting with 149 multi-purpose cooperatives (MPCs) in Oromia;
- 149 MPCs accessed quality seed of preferred varieties and reduced their carry-over in store by participating in the pilot;
- 85 additional woredas piloted DSM bringing the total number of woredas engaged in DSM to 313;

- Experience sharing in DSM facilitated in all four regions Amhara, Oromia, SNNPR and Tigray and the way forward suggested;
- Seed stores for seed marketing agents in Amhara constructed with support of the program.

Mainstreaming social inclusion and nutrition

ISSD Ethiopia strived for increased diversity once again in 2019, not only in terms of the seed available in the market, but socially also. Inclusion of different stakeholders in seed value chain interventions has been achieved foremost through the mixed composition of the regional seed core groups. Representatives of government, industry, science and civil society bring divergent views to discussion in core group meetings. Facilitating dialogue and partnerships among multiple stakeholders in the seed sector is characteristic of ISSD Ethiopia, and this is true for a wider range of forums convened by the program.

In 2019, we continued to train seed value chain actors on gender and to a lesser extent nutrition as. Various other activities, media and communication products were employed to raise awareness for gender and nutrition. The program has sensitized its investment decisions to gender. Since 2016, all investment decisions are documented on grant canvases, which explicitly ask: who benefits; and how is gender addressed in activities? In 2019, we started recording the impact of these investments. All canvases, from 2016 onwards, have been updated using a slightly revised format with this important information for evaluating our impact on numerous areas of outcome, including social inclusion and nutrition.

By facilitating Dutch/international breeding companies trade with and investment in Ethiopia, we have created opportunities to broaden the crop and variety portfolio for which quality seed is on offer. This is particularly important for nutrition, but building climate resilience as well. These companies offer quality seed/lings of fruit and vegetables, potato and forage, all of which are limited in availability in Ethiopia. Fresh fruit and vegetables and potato are important for human nutrition, but so is the dairy and protein derived from improved animal nutrition and quality forage. All of these products are increasing in their cost to consumers in Ethiopia¹, and are significantly lacking in the average rural Ethiopian diet².

Conclusions and recommendations

Achievements

- Over 175 linkages facilitated between seed producers and inputs, services and markets;
- Seed Information Exchange, a digital platform for sharing information on seed availability, expanded to incorporate all four PSEs with the strong encouragement of the State Minister;
- SeedNL mission of Dutch delegates from the ministries of Foreign Affairs and Agriculture and breeding companies East-West Seed and Limagrain-Hazera organized;
- High-level dialogue of the Ethio-NL Seed Committee on constraints to foreign direct investment in the country chaired by the State Minister;
- Long-awaited directive on Unregistered Varieties, a directive ISSD Ethiopia has advocated will increase foreign direct investment and foreign currency reserves in the country, approved;
- Two joint ventures with Enza Zaden and Rijk Zwaan started;
- Seed core groups supported in establishing their legitimacy as collaborative governance structures in all four regions;
- Amhara core group embedded as the leader in guiding seed sector transformation in the region;
- Book on seed sector challenges, roles and responsibilities and strategies for improvement in Amhara published;
- Innovations in seed value chains addressing bottlenecks in seed sector governance, EGS supply, seed quality assurance and seed marketing scaled;
- 313 woredas now engaged in DSM;
- Seven SPCs obtained crop insurance through a pilot with two unions in Oromia (east).

¹ Bachewe, F., Hirvonen, K., Minten, B. and Yimer, F., 2017. The rising costs of nutritious foods in Ethiopia. *Addis Ababa: IFPRI ESSP Research Note*, 67.

² Headey, D., Hirvonen, K., Hoddinott, J. and Stifel, D., 2019. Rural food markets and child nutrition. *American Journal of Agricultural Economics*, 101(5), pp.1311-1327.

Challenges, opportunities and lessons learnt

- Lack of commitment of certain partners and high rates of staff turnover in public institutions and the regional seed core groups;
- Weak coordination among seed value chains actors;
- Interference of local offices of agriculture in contractual seed production in Amhara;
- Over-regulation of seed marketing, particularly in oppressing seed prices;
- Low sensitivity of partners towards gender and nutrition;
- Increased capacity and demand for commodities of agro-industrial parks and expansion of agricultural commercialization clusters;
- Investment in seed quality assurance, including laboratories;
- Guideline on contractual seed production available in Amhara region;
- Directive for contract farming drafted and expected to be endorsed;
- Involvement of seed producers and retailers in seed demand assessment improves the reliability of seed demand forecasts and reduces rates of carryover seed;
- There is significant demand for the Seed Information Exchange from the MoA, yet agreement on the rules of information sharing and responsibilities in data management still has to be reached;
- Inclusive multi-stakeholder dialogue improves seed value chain coordination and integration;
- Contractual EGS production concept accepted, but increased attention to accountability still needs to be given.

Way forward

- Expand the coverage of the Seed Information Exchange and agree on the rules and responsibilities in data management;
- Improve accountability mechanisms in the contractual supply of quality EGS in the country.

Improved enabling environment

Improved enabling environment for enhanced performance of seed value chains

ISSD Ethiopia facilitated a consultative process that led to the publication of the strategic document 'Transforming the Ethiopian Seed Sector: Issues and Strategies'³. The document (henceforth referred to as the transformation agenda) is a stakeholder-owned and MoA endorsed strategic agenda for the seed sector. 24 MoA staff members have been presented the document and informed by the State Ministers to incorporate its strategies in their new multi-annual plan. ISSD Ethiopia chaired the panel finalizing the draft national seed policy; has prepared amendments to the 2013 Seed Proclamation; contributed in the development of the draft Plant Breeders' Right Regulation; and is an active participant in the National Seed Advisory Group. ISSD Ethiopia collaborated in the Netherlands Enterprise Agency (RVO)-funded Institutional Mapping and Capacity Needs Assessment of Ethiopia's Public Seed Sector Services, and takes the study's recommendations on board. In 2017, the program was handed the mandate by MoA to systematize EGS supply in the country and organized a series of meetings in 2019 to monitor and evaluate the progress made to date. New plans for EGS production and marketing in 2019/20 have been developed and contractual agreements signed. ESA was backed in their advocacy to address identified policy constraints to private seed sector development in the new draft seed policy.

Evidence-based innovations advocated and implemented

ISSD Ethiopia facilitated a consultative process that started in April 2018, and led to the publication of the transformation agenda in 2019. The transformation agenda is stakeholder-owned; MoA endorsed; and a big accomplishment for ISSD Ethiopia. The transformation agenda has been presented to 24 MoA staff in the presence of the State Ministers, who informed their staff to incorporate the strategies proposed in their new multi-annual plan. With the same outcome in mind, a process has been started at the regional level and 700 copies have been distributed for public reference. Further to this, ISSD Ethiopia chaired the panel finalizing the draft national seed policy; has prepared amendments to the 2013 Seed Proclamation; contributed in the development of the draft Plant Breeders' Right Regulation; and is an active participant in the National Seed Advisory Group. In addition, ISSD Ethiopia collaborated in the RVO-funded Institutional Mapping and Capacity Needs Assessment of Ethiopia's Public Seed Sector Services, and takes its recommendations on board.

Towards the institutional embedding of ISSD Ethiopia innovations described above in 1. Quality and quantity of sustainable agricultural production; and 2. Improved markets and trade, several achievements have been realized: ATA is scaling local seed business through its CBSP project; 41 ARCs, universities and government offices of agriculture conducted crowdsourcing trials with over 20,000 smallholders in 2019; 313 woredas are now engaged in DSM and a directive clarifying MoA's position on seed marketing has been approved; and three independent seed regulatory authorities have been established. Having conducted 1,000's of tailor-made trainings and offered scholarships in formal education programs at undergraduate and postgraduate levels, ISSD Ethiopia has increased the number of professionals in the seed sector and is often turned to as a source of relevant knowledge. ISSD Ethiopia organizes policy workshops on different thematic areas, commissions relevant studies and consultancies and strengthens the capacity of organizations in governance. Another good example of how these services are put into practice is EGS, where the program has been mandated by MoA to systematize supply. Related outputs in 2019 included:

- Series of stakeholder consultations and traveling workshops organized to monitor progress;
- One-day national workshop organized to evaluate progress, identify problems and share lessons;
- New plans for EGS production and marketing developed and contractual agreements signed;
- Field level supervision of EGS production at five EIAR centres and two ESE farms by senior MoA, EIAR, ESE and ISSD Ethiopia experts coordinated;
- Agreement to incorporate new EGS producers, including capable private entities, reached;
- Support from ISSD Ethiopia in monitoring and mediating incidents of default or dispute between contracting parties agreed to;
- (Deputy) managers and senior inspectors of seed regulatory authorities trained on international conventions, national legislation and inspection and testing techniques for assuring EGS quality.

³ <https://benefitethiopia.files.wordpress.com/2019/08/seed-sector-transformation-guiding-document-final-july-2019.pdf>

Strengthened position of the Ethiopian Seed Association (ESA)

With funding support from AGRA, ESA conducted a study into the policy and non-policy constraints to private seed sector development in Ethiopia. ISSD Ethiopia's seconded staff member to ESA was one of the two consultants leading the study. Continuous effort was made to ensure that the draft seed policy take these constraints and also others raised by vegetable seed importers into account. ISSD Ethiopia backed these discussions and also the input of ESA to the transformation agenda. ESA is satisfied with how their concerns were taken on board in both these strategic documents.

We strengthened the position of ESA by seconding one secretariat officer to the association in 2019 and by including its representatives in strategic dialogue. Other specific outputs in 2019 included:

- Five PSPs joined ESA, thereby increasing the network from 34 to 39 members;
- 12 of the 39 members paid annual membership fees, which is a significant decrease from 2018 and cause for concern;
- 6 PSPs linked by ESA to Melkassa ARC in the production of quality seed of hybrid sorghum varieties;
- Recognition given by government of ESA as an important voice in the seed sector.

Mainstreaming social inclusion and nutrition

In the consultation leading up to the publication of the transformation agenda, ISSD Ethiopia engaged the regional core groups in a visioning and outcome setting exercise for the seed sector and its constituent building blocks. Their input forms the foundation of the document and it is to a large extent as a result their strategies that are being proposed at national level. Accordingly, ISSD Ethiopia gave voice to the agendas and intellect of regional state government, industry, science and civil society in setting the strategic agenda nationally for the coming years. This is common to all forums convened by the program. With regards to nutrition, through its facilitation of the Ethio-NL Seed Committee and support to ESA, ISSD Ethiopia tries to enable the business of vegetable seed companies and importers in Ethiopia to ensure that farmers and consumers get access to quality vegetable seed and nutritious food respectively.

Achievements

- 'Transforming the Ethiopian Seed Sector: Issues and Strategies' strategic document published and 700 copies distributed for public reference;
- 24 MoA staff members informed by the State Ministers to incorporate these strategies in their new multi-annual plan;
- Panel finalizing the draft national seed policy chaired by ISSD Ethiopia;
- Amendments to the 2013 Seed Proclamation prepared;
- Technical contributions given in the development of the draft Plant Breeders' Right Regulation;
- New plans for EGS production and marketing in 2019/20 developed and contractual agreements signed;
- Agreement to incorporate new EGS producers, including capable private entities, reached;
- ESA backed in their advocacy to address identified policy constraints to private sector in the new draft seed policy.

Challenges, opportunities and lessons learnt

- Limited implementation capacity of MoA;
- Weak structure to how the seed sector is governed and a lack of leadership;
- Upcoming elections and change of government;
- Attention given to seed sector challenges is parochial and neither strategic nor effective in addressing root causes of underperformance;
- Government and donor interest in the seed sector;
- Concentration of efforts of development initiatives in the seed sector, including AGP; ATA; AGRA; USAID; GIZ; and CGIAR and EIAR;
- High recognition at regional states and federal levels of the achievements of and willingness to partner with ISSD Ethiopia;
- Endorsement of seed sector transformation agenda;
- Government's commitment towards improving Ethiopia's rank in the World Bank's Enabling the Business of Agriculture index;
- Increasing call for foreign direct investment in Ethiopia;

-
- Stakeholders need to embrace systemic change in order to achieve breakthrough in transforming the seed sector;
 - Systemic change has to be managed inclusively and adaptively;
 - Investment in social capital pays off considerably, but systemic change is a long game.

Way forward

- Strengthen seed sector governance by giving structure to mandated responsibilities in coordinating and regulating activities in the seed sector;
- Ensure that the strategies of the transformation agenda are incorporated in government's multi-annual plans at federal and regional state levels;
- Promote a better understanding and internalization of the strategies proposed among multiple stakeholders;
- Strengthen government's capacities to lead, coordinate and regulate transformation in the seed sector;
- Invest considerably in the seed regulatory services of phytosanitation and quarantine, variety registration and seed quality assurance.

Collaboration

Internal systems of planning, monitoring and evaluation have been improved in 2019. Impact reporting on the vast number of investments made by ISSD Ethiopia has commenced through the use of updated grant canvasses. A grading tool has been developed to assist staff in selecting high potential seed producers to work with in 2020. A multitude of new news items published, which can be read on our website: www.ISSDethiopia.org. In collaboration with BENEFIT partners, the value chains of malt barley, potato, sesame and soybean have been strengthened at various locations across the country. Collaboration with EIAR, RARIs, Bahir Dar, Haramaya and Mekelle universities and offices of agriculture reached over 20,000 new participants in crowdsourcing. Collaboration with GIZ has strengthened local seed business in Oromia. DSM has been scaled to 313 woredas across the country and 25 CIGs have been upgraded to SPC level as a result of our partnership with AGP. Together with Bioversity International, we have developed the Seed Information Exchange in response to strong demand from MoA and the State Minister herself.

M&E and communication

Internal systems of planning, monitoring and evaluation have been improved in 2019 through the introduction of impact reporting in the existing grant canvasses. To assist staff in selecting high potential seed producers with which to continue working in 2020, the recently developed grading tool has proven very useful. These complement other earlier investments in an M&E matrix and manual; data sheets for management of basic, production and marketing data; key performance indicators (KPIs) for seed producers; seed producer profiles; BENEFIT indicator tracking table; baseline seed availability and use survey; most significant change stories; mid-term review (MTR); seed systems security assessment; and other studies including those in informal seed systems and on seed sector transformation. In addition, ISSD Ethiopia PMU conducts quarterly visits to regional units to monitor outputs and expenditure and to participate in activity planning for the coming three months.

Annually, the regional workshops and regional unit planning meetings are important moments for evaluation and planning in the presence of senior management from PMU and WCDI. Once a year, all staff members come together for the purpose of sharing and learning from experiences, exploring important thematic areas of intervention and to build a constructive social working environment and team spirit. At each of the regional units and PMU is a knowledge sharing and communication expert synthesizing our knowledge into communication products for multiple media and target audiences. News items can be read on our website: www.ISSDethiopia.org.

Collaboration

Collaboration with BENEFIT programmes. Collaboration takes place between ISSD Ethiopia and its partners in BENEFIT in product and place combinations and on thematic areas including: gender; nutrition; climate resilience; scaling; capacity strengthening; access to finance; monitoring and evaluation; and communication. Together, we are supporting development of the value chains of malt barley, potato, sesame, and soybean.

Malt barley in Amhara, SNNPR and Tigray:

- ISSD Ethiopia linked SPCs to Guna Union to access basic seed of improved malt barley varieties;
- ISSD Ethiopia strengthened the capacities of SPCs to produce quality malt barley seed;
- CASCAPE facilitated growers' procurement of quality malt barley seed from SPCs;
- CASCAPE trained, coached and supervised malt barley growers in their application of best-fit practices;
- ISSD Ethiopia and CASCAPE collaborated in assessing malt barley seed demand in SNNPR;
- 40 t quality malt barley seed was harvested in SNNPR for growers to sow in 2020;
- ISSD Ethiopia, CASCAPE and REALISE jointly convened 27 participants in a malt barley platform planning meeting in Tigray and conducted field level monitoring and coaching of participants.

Potato in Amhara and Oromia:

- ISSD Ethiopia and CASCAPE collaborated in supporting disease-free potato production in Amhara;
- ISSD Ethiopia strengthened the capacity of Addis Alem SPC to produce mini-tubers from disease-free potato plantlets for quality seed potato production;

- CASCAPE trained, coached and supervised ware potato growers in their application of best-fit practices throughout Farta woreda;
- ISSD Ethiopia and REALISE jointly trained 100 farmers including 50 women in marginal areas of Jarso and Deder woredas in Oromia on quality seed potato production;
- 10 t of quality seed potatoes were harvested.

Sesame in north-west Ethiopia:

- ISSD Ethiopia and SBN jointly coordinated PVS and crowdsourcing trials on 63 farmer fields in Amhara to select preferred sesame varieties;
- ISSD Ethiopia and SBN jointly trained 62 farmers on quality seed production in Amhara and Tigray to multiply preferred sesame varieties;
- ISSD Ethiopia, CASCAPE and SBN jointly trained 25 DAs in Tigray on sesame seed production, environmental management, financial literacy, business management and value chain development.

Soybean in Amhara and Oromia:

- ISSD Ethiopia and SBN collaboratively conducted soybean PVS and crowdsourcing trials on 83 farmer fields;
- ISSD Ethiopia and CASCAPE strengthened the capacity of 40 members of three CIGs in Wayu Tuka and Chora woredas in Oromia to multiply quality soybean seed;
- ISSD Ethiopia supported these CIGs in organizing and registering themselves as SPCs.

Collaboration with other projects and partners. In 2019, collaboration with a very wide range of N/GOs; research and knowledge institutes; and industry players at inter/national, regional state and local levels continued. ISSD Ethiopia maintains relationships with all key stakeholders in the seed sector. Here are a few selected examples:

- PVS and crowdsourcing scaled in partnership with Bahir Dar, Haramaya and Mekelle universities;
- Capacities of 103 farmers drawn from 17 SPCs in local seed business strengthened in collaboration with the GIZ-led Green Innovation Centre;
- Over 25 CIGs in Oromia and Tigray upgraded to SPCs in collaboration with AGP;
- DSM scaled to 313 woredas with recent support from AGP;
- Four unions collaborate in piloting seed demand assessment by MPCs in Oromia;
- Deliberation with ATA and Regional Cooperative Promotion Agency (RCPA) in Amhara resolved conflicts between SPCs and unions;
- Potato value chain development strategy for Amhara developed with VITA and ORDA;
- Partnership with Bioversity International has helped introduce crowdsourcing and the Seed Informational Exchange to Ethiopia.

Collaboration with Dutch private sector. ISSD Ethiopia currently extends its support to BASF-Nunhems; Bejo; East-West Seed; Enza Zaden; Limagrain-Hazera; Rijk Zwaan and Syngenta.

Thematic collaboration. ISSD Ethiopia collaborated with REALISE in 2019 on the topics of crowdsourcing and local seed business. Through crowdsourcing, REALISE has introduced new and improved varieties to as many as 20,000 farmers. Drawing upon the vast experience of SBN in increasing financial literacy among smallholders, ISSD Ethiopia distributed cash books and manuals for financial record keeping and conducted financial literacy training with 368 farmers. In addition, ISSD Ethiopia actively contributes to knowledge sharing among partners on the topics of gender, nutrition and climate resilience.

Mainstreaming social inclusion & nutrition

ISSD Ethiopia has assessed and documented gendered task division and dynamics in the potato value chains of Amhara and Oromia in collaboration with CASCAPE and REALISE respectively. By scaling crowdsourcing to new areas, REALISE and ISSD Ethiopia have a better understanding of women's preferred crops, varieties and traits. In all four regions, ISSD Ethiopia, CASCAPE, REALISE and SBN are coming together to share experiences in improving the nutrition security of rural households in Ethiopia. Nutrition security is given due emphasis in BENEFIT and is a targeted outcome of the ISSD Ethiopia and REALISE programs.

Transferring responsibilities and ownership

With regards to the transfer of responsibilities from WCDI to PMU, ISSD is largely on schedule with what was proposed in 2015. Please see Table 1 for more details.

Table 1 Status update on transfer of responsibilities WCDI-PMU in ISSD Ethiopia

Responsibility	Transfer	Explanation
Annual planning and budgeting	Partially complete	PMU proposes focus areas for the coming year and WCDI gives feedback. Jointly, PMU and WCDI set boundaries to work planning, for example outputs targeted and criteria for target group selection and resource allocation. Activities are then proposed by regional units to which PMU and WCDI give critical feedback. WCDI compiles the consolidated plan, PMU reviews it and suggests edit before it is submitted to EKN. Based on the plan, WCDI proposes budget to which PMU gives feedback. PMU regularly consults regional units about budget utilization and allocation, which is valuable information incorporated in budgeting.
Staff recruitment	Complete	PMU is fully in control and consults with WCDI when need be, for example in developing/revising job descriptions and in shortlisting candidates.
External communication	Partially complete	BENEFIT Portfolio Director is lead contact with EKN unless delegated to BENEFIT Coordinator. EKN consults directly with PMU on technical issues ad hoc. PMU leads contact with Ethiopian partners. Due to practical reasons, WCDI is lead contact on international partners.
Program and financial reporting	Complete	Narrative and financial reports are drafted by PMU, reviewed by WCDI and compiled and controlled by PCU.
Technical assistance	Partially complete	PMU consults regional units on capacity needs and shares assessment with WCDI. WCDI evaluates and prioritizes capacity needs and provides or procures to provide technical assistance.

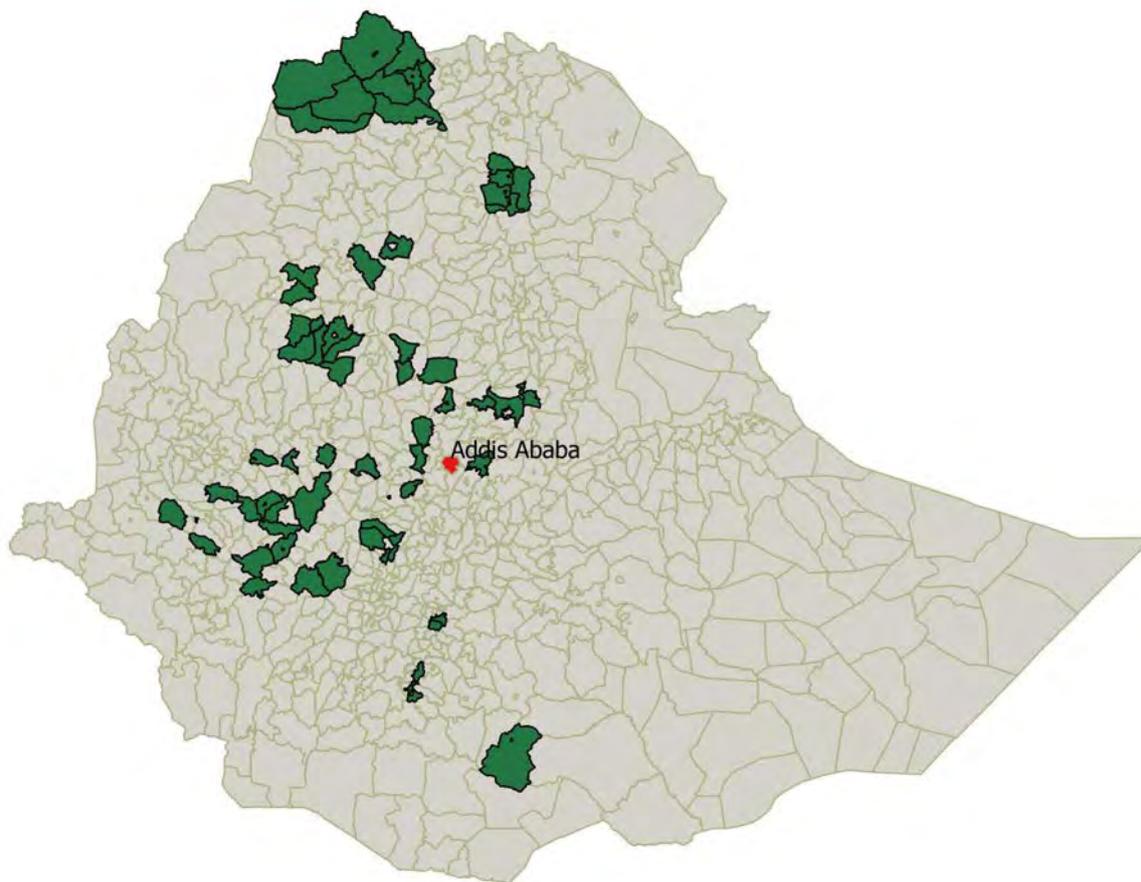
Achievements

- Internal systems of planning, monitoring and evaluation improved in 2019 through introduction of impact reporting in existing grant canvases;
- Grading tool developed to assist staff in selecting high potential seed producers with which to work in 2020;
- A multitude of new news items published, which can be read on our website: www.ISSDethiopia.org;
- Malt barley value chains strengthened in Amhara, SNNPR and Tigray in collaboration with CASCAPE;
- Potato value chains strengthened in Amhara and Oromia in collaboration with CASCAPE and REALISE;
- Sesame value chains strengthened in north-west Ethiopia in collaboration with CASCAPE and SBN;
- Soybean value chains strengthened in Oromia in collaboration with CASCAPE;
- Collaboration with EIAR, RARIs, Bahir Dar, Haramaya and Mekelle universities and offices of agriculture reached over 20,000 new participants in crowdsourcing;
- Collaboration with GIZ strengthened local seed business in Oromia;
- Collaboration with AGP helped scale DSM to 313 woredas and upgrade 25 CIGs to SPC level;
- Partnership with Bioversity International introduced the Seed Information Exchange to Ethiopia.

Challenges, opportunities, lessons learnt and way forward

- Integration among BENEFIT partners in product and place is limited;
- Already ambitious targets and expectations raised among stakeholders compete for time and resource allocation to collaborative activities;
- High staff turnover in public institutions and the generally intensive nature of maintaining warm relations with stakeholders demands time of our staff that could have been diverted elsewhere;
- As BENEFIT comes to an end and the focus is shifting towards documenting and sharing lessons, there is potential to join efforts in institutionally imbedding innovations in Ethiopia;
- The success of the portfolio as a whole is a result of strong collaboration bilaterally between Ethiopia and the Netherlands, among government, industry, science and civil society in and between both countries, and across the various value chains in Ethiopia, from production to consumption;
- Document and share lessons learnt and join efforts in making a final push towards embedding promising innovations in institutions in Ethiopia.





Executive Summary

Introduction

The year 2019 has been the final year of implementation of the second phase of the BENEFIT-CASCAPE programme. The expected outcome of BENEFIT-CASCAPE is “enhanced capacity of the research and extension system to generate demand-driven best fit technologies for uptake by smallholder farmers.” Activities implemented to achieve the outcomes are categorized in four major headings, namely, (1) testing and validating best-fit technologies; (2) pilot scaling, scaling support and pre-extension demonstrations of validated best-fit technologies; (3) woreda development support to maximize agricultural productivity through effective planning by means of integration of best-fit practices; and (4) capacity development for research and extension stakeholders and farmers to enhance their technical skill and knowledge to generate and disseminate demand-driven technologies. Given the fact that 2019 is the final year of the project, there was deliberate scaling down of testing/validation activities to focus more on documentation, dissemination, organic scaling and capacity development. This report highlights major achievements, lessons learnt and challenges faced in implementing the programme activities in 2019.

Major achievements

- In 2019, the programme reached 888,176 smallholder farmers of which 92,261 are reached directly through testing/validation, pilot scaling, PED activities, and field days; and the rest indirectly through scaling support, organic scaling and by media broadcast on best practices;

- CASCAPE-validated best fit practices have covered 224,161 ha of farmland, which includes reach of best practices through organic scaling in 57 woredas enabling significant increase in the yields (>50%) of major crops (wheat, maize, teff, barley, potato, etc);
- AGP financed the cascading of CASCAPE ToTs to train about 30,000 extension staff (SMS and DAs) to enhance their technical skills and knowledge to disseminate demand-driven technologies. In addition, new ToTs were provided for 656 experts and on-the-spot training was provided for 2357 farmers involved in CASCAPE pilot scaling and PED activities;
- 29 best fit practice manuals (15 new and 14 revised) were prepared and submitted to the extension directorate of which seven are already incorporated in the extension package for model farmers to be implemented in 2020 growing season;
- The research-extension-university linkage innovation piloted by CASCAPE has been successfully institutionalised within the MoA;
- The PAR approach and integrated validation protocol piloted by CASCAPE has now been adopted by the EIAR and some RARIs (e.g., TARI). This is instrumental; to generate demand driven technologies and screen on the basis of holistic criteria rather than just yield alone (e.g., profitability, farmer preferences, environmental sustainability, gender/nutrition);
- At national level, a high-level policy dialogue and national events were organized for research-extension and university linkage (in March 2019) and to share the results of D4A survey panel data combined with field excursion for high officials (in October). Regional teams organized series of stakeholder workshops to actively review plans and share results of the project;
- Based on the results of the blend fertilizer trials on different crops and soil types, CASCAPE was able to influence the national level policy debate on soil fertility sector that led to the revision and refinement of fertilizer recommendation and preparation of five year (2018-2022) soil fertility strategy of the GoE. The project released soil and crop-specific fertilizer recommendations suitable for different agro-ecological zones that lead the regional-based fertilizer recommendation;
- Successful experiences gained, lessons learnt and results of the project are documented in seven scientific papers published (7 more are submitted and 11 others drafted), 7 policy briefs, 2 CASCAPE legacy books, documentary videos, and national/regional synthesis reports (D4A panel survey, training outcome assessment, outcome level M&E of scaling process, etc). Papers in draft stage are expected to be finalized during the upcoming writeshop scheduled for 13-21 February;
- The programme received media attention that documented high level policy dialogue events and field visits as well as farmer fields both at regional and national levels. These were on air in ETV & Radio, WALTA Information Centre as well as regional media agencies (south TV, Tigray TV, etc);
- The programme established 337 number of home gardens (fruits, leafy vegetables) for household diet diversification and DAS were trained how to manage home gardens;
- Farmers have incorporated Rhodes grass in the farming system around Bahir Dar leading increased crop-livestock integration in the maize-potato-teff system and increased incorporation of maize residue for soil improvement;
- CASCAPE, through its IRM, internationally competed and won an Olam prize for innovation in food security 2019. The mapping teams finalized and submitted 7 innovation recommendation/ suitability map that is ready to be used by our stakeholders.

Major challenges, opportunities, lessons learnt and way forward (exec summary)

Challenges

- Security issues concerns in some regions such as SNNPR because of the referendum in Sidama Zone and unrest in Oromiya regions restricted mobility;
- Staff and DA turnover and reshuffling of government officials created instability in institutional linkages. Many project staff have also left in search of better options and job security;
- The fact that BoA and WoA use their own production manuals and extension approaches following nationally prepared package undermines full utilization of CASCAPE's best fit practice manuals. But the cluster approach from ATA is different;
- Working with stakeholders requires a great deal of continuous discussions but BoA and woreda officials are busy with other political and administrative duties making it hard for CASCAPE team in the regions to have in-depth discussion to translate good ideas/plans into action. This is partly circumvented through institutional advisors at regional and national levels;

- Limited access and availability of good quality seed, finance (institutional credit), and markets for produce (with high yielding varieties such as potato) are important scaling challenges;
- The onset and cessation of rainfall was also problematic as the late start delayed planting in some regions and the prolonged rain affected crop harvest;
- Disease and pest management – new strains of stem and leaf rust on wheat and barley, potato late blight, chocolate spot on faba bean are among the major challenges. Varieties tested and disseminated become susceptible to new strains making it necessary to continuously screen new varieties for disease and pest tolerance. In some parts of Tigray and Oromia, the spread of desert locust attack on maturing field crops was a major challenge;
- Poor road infrastructures and distance to intervention area (e.g., Mekelle to Humera, Jimma cluster);
- Incidence of pests and disease were also reported from clusters together with lack of agrochemicals to tackle the problem;
- Lack of access to appropriate labour-saving technologies (e.g., row planter for teff and sesame) affected the implementation of planned activities. In certain cases, lack of trained operators for the already available machineries (e.g. sesame row planter);
- Inadequate market linkage for farm produce such as potato in Bahir Dar;
- Shortage of fertilizer inputs such as KCl and Boron fertilizer blend to implement fertilizer trials as per treatment design problems we faced during the reporting period;
- Lack of qualified and competent experts with relevant professional experience at Woreda office of agriculture and the low level of attention given to planning.

Opportunities

- By the decision of the state minister, CASCAPE is now a member of the national extension package formulation team at regional and national level. It is also represented in the EIAR advisory board which creates opportunity for mainstreaming best practices and piloted approaches;
- Institutionalization of CASCAPE approaches; e.g., our BFPM becomes part of the regular extension;
- Excellent partnership with EIAR, RARIs, MoA/BoA and AGP who are now looking up for CASCAPE for innovative approaches and ready to uptake results;
- The presence of federal and regional research centres in CASCAPE intervention areas;
- The emerging opportunity of market; e.g., for malt barley, soya bean, improve seed produced by farmers group;
- The presence of BENEFIT partners and other stakeholders in project areas for collaboration;
- Improved knowledge of SMS and DAs that enhanced the uptake of best fit technologies;
- The potential demand for modern machineries such as tractors, row planters, harvesters, and others;
- The Agro-industry parks under construction in different parts of the country that motivates producers;
- Willingness and the availability of Government structure at and multipurpose cooperatives Kebele level;
- The establishment of different platforms that paved ways to discuss problems which are beyond one institution.

Lessons learnt

- Address agricultural production constraints in a holistic manner; solving a single problem (e.g., introducing improved varieties) without addressing other constraints (e.g., low soil fertility, pest and disease management) may not bring the intended result of increased yields;
- Technology alone is not a sufficient condition for successful uptake of best practices – input supply (e.g., seed and agrochemicals market linkage and input supply) are also important for technology uptake by farmers;
- The involvement of CASCAPE experts in the woreda development planning process facilitates the inclusion of CASCAPE-validated best practice within the Woreda agricultural plans;
- Participation of research and extension stakeholders in the project annual review and planning workshops first at regional level and then at national level sensitizes stakeholders about CASCAPE interventions and project outcomes, and creates a favourable condition for the alignment and collaboration at all levels;

- Joint activities require agreed common working procedure, feasible goal, achievable plan, common research approach and methodology;
- Farmer field days become important vehicle to familiarize farmers and stakeholders about technologies and best practices and attracts media attention (television radio dissemination). But it is most effective when organized jointly with relevant stakeholders (extension, RARIs, BENEFIT sister projects such as ISSD and SBN) than unilaterally by CASCAPE;
- Provision of trainings based on the competency level of the target group improves uptake. However, training that followed participatory learning (andragogy), increases participants' interest on the trainings;
- Close supervision contributes for the success of validation, pilot scaling, PED and scaling support activities;
- Training sessions are likely to be more successful when provided during appropriate season (before or after the peak agricultural periods);
- On-the-spot (in-situ) trainings to DAs and farmers improves implementation of project activities;
- Collaboration avoids unnecessary repetition in research, achieve result more quickly, save money and leads to a higher success rate and higher degree of influence;
- Proper planning that considers available resources and key challenges is crucial for bringing changes in agriculture;
- Working with farmers and DAs addresses knowledge gaps regarding nutrition sensitive agriculture. Therefore, organizing events to discuss nutrition-sensitive agriculture contributes towards awareness creation on diversified food production.

Way forward

- Work with MoA extension directorate in incorporate/institutionalize CASCAPE-validated BFPs in the national extension packages to be formulated in February;
- Preparation of final soil-landscape maps of Farta, Matama and K/Humera woredas;
- Finalisation of technical skill training on programming (script writing) and handing over/institutionalization of the IRM to ESRI;
- Capacity development of the BoA and research (EIAR, RARIs) staffs in BFP screening, integrated validation and implementation and for better dissemination and scaling up;
- Finalize scaling approach and process M&E and produce synthesis report on lessons learnt and experiences and changes faced;
- Finalizing de documentation of CASCAPE learnings and disseminating the findings to a broad based of stakeholders by means of publications, synthesis reports and policy briefs;
- Organization writeshop to finalize draft manuscripts for scientific publication and dissemination with broad based national/international audience;
- Together with BENEFIT-PCU, organize national and regional result and lesson sharing events with different stakeholders to ensure institutional embedding.

Quality and quantity of sustainable agricultural production (exec summary)

CASCAPE made a major leap in generating and scaling demand-driven innovations and BFP to increase quality and quantity of sustainable agricultural production. Farmer reach and area of farmland covered by CASCAPE validated BFPs gone beyond the target set at the planning stage. This is mainly due to the organic scaling activities of the woredas supported by the AGP. Yields of all crops tested have increased >50% hence contributing towards national and regional food security and household income. The establishment of large number of home gardens and field crop (pulses, potato) demonstration contributes towards household diet diversification and promotion of nutrition-sensitive agriculture. The BFP manuals delivered to the extension system and the technical skill training provided to experts at woreda and kebele levels contributes immensely for the sustainable production. More importantly however, participation of hundreds of thousands of farmers in the testing/validation, scaling and on-spot training empower them to continuously innovate adapt agricultural technologies to their local conditions. The simplified extension training materials prepared in local languages and placed at FTCs are important channels of information to experts and farmers.

Improved enabling environment (exec summary)

Wide range of workshops, and institutional advisory meetings have allowed key research and extension stakeholders to be continuously informed of the successful experiences gained and best

practices generated by CASCAPE. High level policy debate accompanied by policy briefs and technical notes are actively shared with policy makers including members of parliament, heads of extension programmes at MoA and BoA, RARIs and EIAR. For research and academia who are important players in the policy formulation, scientific papers have been published and shared. One example of such papers that made sound impact on agricultural policy is the paper on “Explaining wheat yields” paper as result of which the MoA decides to stop importing wheat by 2023 by adopting site specific blend fertilizer application in the 1.7 million ha of farmland conducive for wheat production in the highlands coupled with irrigated wheat production. Media attention was attained through documentary videos, press release/media briefs and news channels allowed the dissemination of and increased awareness on BFP.

Partnership and collaboration (exec summary)

Partnership with AGP, EIAR and extension at all levels (federal, regional and woreda levels) has improved tremendously over the past years. Classical example of this include the substantial allocation of AGP funds for organic scaling (particularly remarkable in Tigray and SNNPR) and cascading CASCAPE delivered ToTs at kebele level. In recent years, EIAR has shown tremendous interest in CASCAPE approaches such as the participatory Action Research (PAR) and integrated validation protocol for screening technologies. These approaches are now been implemented on hundreds of hectares of land with the involvement of RARIs. The successful institutional innovation demonstrated by CASCAPE that involves research-extension and universities has now been institutionalized in MoA. Due to the work of the project, stakeholders acknowledged that the lack of functional relations between knowledge and extension institutions has been a major obstacle for increased dissemination and uptake of technologies by farmers. Major units of the extension directorate of MoA (e.g., crop, horticulture, training, ADPLAC, etc) have excellent relationship with CASCAPE. This creates conducive environment for the incorporation of BFP manuals into the national extension package. Partnership with CDSF enabled the preparation of simplified extension training materials in local languages which is important tools for farmer training at FTCs.

CASCAPE developed clear role and responsibility matrix with research (RARIs), extension and AGP stakeholders so that they may own and sustain in the activities piloted by the project. In AGP, CASCAPE is responsible for demonstrating better ways of identification, screening and validation of best practices and developing scaling strategy. The project works with RARIs in testing, validation and PEDs who are ultimately responsible to carry out these activities. Part-time staff of RARIs serve as links with the project. With BoA, the project conducts ToT based on the need assessment on skill gaps while AGP provides the finances for cascading these to woreda and kebele levels. In most regions, ISSD and CASCAPE have excellent collaborative activities on strategic commodities (e.g., malt barley in SNNPR and Mekelle, soybean in Jimma). With REALISE which is essentially an offshoot of CASCAPE but for the low potential areas, there is emerging partnership not only in terms of best practice sharing but also in developing innovative ways of recommendation and soil mapping.

Quality and quantity of sustainable agricultural production

Best fit agricultural practices developed and made available for dissemination

Testing, validation, pilot scaling and PED of best-fit technologies

Testing and validation

Given that 2019 was the final year for field based activities, more emphasis was given on scaling support (training, M&E), documentation and result sharing and there was less on testing and validation activities. To complete the testing & validation trials initiated in the previous years, 13 testing & validation activities were implemented in 2019 (Table 1). These were mostly crop management and fertilizer recommendation trials to derive at crop and soil specific recommendations, and integrated disease management. The comparative yield advantage from CASCAPE trials are indicated in Table 2. Now the complete data sets are generated and analysed, the results are ready to be disseminated among the stakeholders and policy makers by means of publications and policy briefs.

Table 1 Number of testing and validation trials conducted in 2019

Cluster	No. of activities			Total
	Crops	Fertilizers/ISFM	Disease management	
Addis Ababa University	1	2		3
Bahir Dar University	1	1		2
Hawassa University	1	1		2
Jimma University		2	1	3
Mekelle University	3	-		3
Total	6	6		13

Table 2 Yield increment as a result of CASCAPE best fit practices in PEDs/scaling activities

Cluster/region	Crop/variety	CASCAPE PED/scaling trial yield (t/ha)	Regional CSA (yield (t/ha))	% increment over CSA
BDU/Amhara	Belete potato (<i>Solanum tuberosum</i> L.)	32	15.4	107
BDU/Amhara	Food barley (HB 1307)	2.6	1.8	44.4
HU/SNNPR	Bread wheat	3.74	1.9	96.8
HU/SNNPR	Malt barley	2.8	1.9	47.3
HU/SNNPR	Common bean	2.0	1.6	25
JU/Oromia southwest	Maize (BH661)	62.25	39.95	55.8
MU/Tigray	Bread wheat	5.17	2.1	146
MU/Tigray	Potato	32.5	7.85	314

Pilot-scaling and scaling support activities

Scaling is the role of extension and not of CASCAPE. However, as part of developing realistic scaling strategies, CASCAPE implements pilot scaling activities on large number of farmers and bigger plot sizes on promising technologies that emerge from the testing phase. These are aimed at identification of scaling challenges and familiarization of farmers and DAs with the technology. In 2019, the project implemented 12 pilot scaling on different topics in different clusters (Table 3). In parallel, the programme conducts scaling support activities to the woreda extension who are promoting and scaling CASCAPE-validated BFPs. Here, our role is following up proper incorporation of BFPs, capacity development and M&E support to AGP and extension. In 2019, project reach through scaling support activities was 362,277 farmers of which 21% were female-headed; the participation of female farmers in Mekelle was 35% (Table 4). The scaling support activities are much higher than originally planned because more emphasis was given to scaling support and capacity building in 2019.

Table 3 No of pilot scaling in each of the university clusters

University/Cluster	No	Descriptions
Addis Ababa University	--	
Bahir Dar University	7	<ul style="list-style-type: none"> • Effect of blended NPSZnB and urea fertilizers on Irish Potato; • Effect of blended NPSZnB fertilizers with urea on Bread Wheat productivity; • Plant Population Density and Nitrogen on Maize Grain Yield; • Rhodes grass and legume mixtures under rain-fed condition; • Alfalfa varieties; • Oat and vetch mixture; • Sweet lupin (Vetiver).
Hawassa University	2	<ul style="list-style-type: none"> • Optimum fertilizer rate for production of malt barley; • Optimum plant population for enhancing maize productivity.
Jimma University	--	
Mekelle University	3	<ul style="list-style-type: none"> • Improved sesame varieties; • High yielding and disease resistant wheat variety; • High yielding malt barley variety (EH 1847 and Holker).
Total	12	

Table 4 Number of farmers reached through scaling support activities in 2019

	No. of farmers			Proportion of female (%)
	Male	Female	Total	
Addis Ababa University	48,200	6,500	54,700	13
Bahir Dar University	26,601	2,376	28,977	9
Hawassa University	136,687	25,582	162,269	19
Jimma University	62,096	19,576	81,668	32
Mekelle University	25,695	8,964	34,659	35
Total	299,279	62,998	362,277	21

PED activities

The innovation pathway of CASCAPE involves Pre-Extension Demonstration (PED) with best practices and/or innovations that are performing best in the pilot scaling phase. In 2019, we carried out 23 PEDs. These included regionally prioritized crops such as teff, maize, barley, wheat, potato, chickpea etc. in different clusters (Table 5). In addition, some fodder crops (oat and vetch, Rhodes grass in Bahir Dar, and Desho grass in Hawassa) and fruit trees (Mango and Avocado) and vegetables were included. In doing so, over 130 ha of land was covered by these crops and about 1000 farmers reached that includes significant number of female headed households.

Table 5 Number of PEDs conducted, farmers reached and land area covered by PED in 2019

University/Cluster	No. of PEDs	Area covered (ha)	Farmers reached		
			Male	Female	Total
Addis Ababa University	6 (Bread wheat, dega teff, food barley, chickpea, potato, & lentil)	31.3	117	39	156
Bahir Dar University	5 (Food barley, potato, malt barley, Rhodes grass, oat & vetch)	27.5	233	52	285
Hawassa University	6 (Maize, malt barley, Enset processing, vegetables, Desho grass, Faba bean)	33.9	173	138	311
Jimma University	3 (Guduru teff, Faba bean, Potato)	26.3	135	15	150
Mekelle University	3 (Chickpea, potato, papaya)	11.3	59	28	87
Total	23	130.3	717	272	989

Enhancing capacity of EIAR and RARIs in best-fit technology testing

Usually CASCAPE involves both the national and regional research centres in very many research undertakings. However, as stated above, there was limited research emphasis in 2019 and hence

limited collaborative activities with the RARIs. With EIAR, CASCAPE has jointly evaluated the results of large-scale demonstration of agricultural technologies based on validated Participatory Action Research (PAR) approach. EIAR experts were also beneficiaries of the IRM technical skill development and script writing trainings. In the regions, Mekelle University implemented three joint research activities with TARI (Humera agricultural research centres) on sesame row spacing, soil pH management and N-fertilization and involved researchers from Humera ARC in soil characterisation and mapping. In addition, EIAR and RARI (15 staff) staff were involved in skill training programmes such as the IRM mapping approach and R-statistical package. As a result of the IRM training and others, experts from Shire-Maitseabri agricultural research centre have produced BFPM for sorghum production.

Testing and delivering demand-driven technology to the extension department at national, regional and woreda level

Preparation and delivery of best fit practice manuals to federal extension directorate

Agricultural innovations and best practices that passed the PED stage were prepared into best-fit manuals for implementation by the extension system. In 2019, we revised 14 best fit practice manuals (BFPM) and prepared 15 new ones based on testing, validation, pilot scaling and PED activities of past years (Table 6). Revision of the BFPMs was necessary because of changes in crop varieties, new fertilizer types and rates of application and other recent developments. The regional cluster teams involved experts from BoA in the review of the BFPM. CASCAPE organized a national stakeholder workshop to handover the BFPMs to the extension directorate of MoA including experts from different divisions of the extension, EIAR and BENEFIT sister projects. The state minister of MoA assigned 29 experts from RARIs, EIR and different divisions of the extension directorate of MoA to formulate extension package for model farmers based on seven of the BFPMs (potato, garlic, soya bean, malt barley, maize, faba bean and wheat). The remaining 22 BFPMs will be revised and considered for incorporation into the national extension package for smallholder farmers.

In addition, CASCAPE facilitated the preparation of simplified extension training materials in collaboration with the CDSF project. In 2019, five BFPMs (poultry, garlic, wheat, faba and soya bean) were translated into simplified extension training materials to be used by SMS at woreda level. These materials were translated into local languages (Tigrigna, Afan Oromo and Amharic) for use by the DAs and SMSs for farmer training in farmers training centres (FTCs). Key messages from the locally translated materials were made into posters, laminated charts, flip charts, etc for display at the FTCs to be used by farmers.

Table 6 New and revised BFPM prepared in 2019

University/Cluster	No of BFPMs Prepared			Descriptions
	New	Revised	Total	
Addis Ababa University	5	1	6	Two varieties of bread wheat (Senate & Hidasse), Dega teff, chickpea, food barley and potato.
Bahir Dar University	2	4	6	Malt barley, oat and vetch, and Rhodes grass – new; potato, wheat and sweet lupin- revised
Hawassa University	2	4	6	Maize haricot bean intercropping and maize vetch under sowing -new; maize, faba bean, wheat and malt barley value chain-revised.
Jimma University	3	5	8	Belete potato, Guduru teff and Tumsa faba bean - new; and maize (BH661), maize (Limu), bread wheat (dand'a), bread wheat (Senate) and soya bean (Keta)- revised BFPMs.
Mekelle University	3	-	3	Chickpea, sesame, and sorghum production.
Total	15	14	29	

Soil characterization and mapping

Similarities in soil types is one of the biophysical conditions for scaling innovations from sites of testing to sites of scaling. Accordingly, soil characterisation and mapping work for all the high intensity woredas was initiated. Characterizing and mapping soils based on soil-landscape relationships is

important to guide soil fertility management decisions at farm level. In 2019, the soil survey and mapping in three newly added research woredas – Farta and Matama in Amhara region and Kafta Humera in Tigray region was completed. Soil landscape based survey has been complete based on the geospatial base map prepared by ISRIC, samples have been analysed and auger and profile database has been established. There is standing agreement with ISRIC to prepare the maps and preparation of the final soil maps which is delayed, but well underway. Reasons for the delay include delays in field work due to security concerns in Amahara region, delayed laboratory analysis due to chemical shortage and ill-health of the lead surveyor consultant during fieldwork.

Research priorities and results are discussed between RARIs, Universities and Extension Department at federal and regional level

Meetings/workshops to share research priorities

Following the annual review and planning meeting, the regional teams organized regional stakeholder workshops to share research and extension priorities in their respective regions and align activities (Table 7). The national level meeting brought together federal and regional research, extension and AGP officials to share experience, align plans and priorities and seek alignment for implementation. As a result of these all workshops and meetings with regional and federal officials, CASCAPE approaches and results are institutionalized in the agricultural system.

Table 7 Meetings and workshops organized by CASCAPE

Cluster	National/regional stakeholder meetings/workshop organized
Hawassa	<ul style="list-style-type: none"> • Institutional advisors meeting; • AGP woredas support and plan alignment review workshop.
Jimma	<ul style="list-style-type: none"> • 2019 Planning meeting; • Result sharing workshop.
Mekelle	<ul style="list-style-type: none"> • Stakeholders' workshop on result sharing and documents' hand over; • Meeting to strengthen the already established malt barley platform.
BDU	<ul style="list-style-type: none"> • Regional review and planning workshop.
AAU	<ul style="list-style-type: none"> • Result sharing workshop; • Annual woreda planning meeting.
NPMU	<ul style="list-style-type: none"> • Integrated Soil Fertility Management workshop; • Research- Extension-Education linkage workshop; • High level policy dialogue workshop and field excursion for officials.

Research-Extension-University Linkage supported

The organization of the Research-Extension-University linkage platform for continuous dialogue, discussion and communication between research and extension actors was supported. EIAR - CASCAPE joint workshop was organized in February 2019 to evaluate the results of large-scale joint demonstration of agricultural technologies. Based on this, the CASCAPE validated PAR approach was implemented by EIAR and RARIs on 1589 hectares of land owned by about 3000 farmers. The work towards strengthening collaboration and linkage between extension, research and higher learning institutes started in 2018 with a study commissioned by BENEFIT-CASCAPE in partnership with MoA to better understand the gaps in linkages between the three institutions. With endorsement by the Minister of MoA under direct supervision of the state minister, the Research-Extension-University linkage platform is now officially hosted within the MoA. More importantly, EIAR and RARIs such as TARI have now adopted PAR approach and the integrated validation protocol as developed by CASCAPE and mainstreamed in their research system to generate and promote demand-driven technologies with farmers.

In-depth research and survey

In-depth study

A limited number of in-depth studies were implemented including light adoption survey panel data generation, outcome level M&E scaling process and training outcome assessment. The drivers of adoption panel survey mainly focused on supporting cluster teams in data analysis, cluster-based

report writing and national synthesis report. The nationally synthesized panel data reports were presented at a national stakeholder meeting and comments were incorporated and submitted to the extension directorate of MoA. Producing cluster-based D4A reports and scientific papers is the remaining work to be done during the no-cost extension period. Moreover, in an effort to complete previously initiated in-depth studies, some clusters carried out a selected number of in-depth studies. Effect of row spacing and seed rates on the performances of *teff*, and rhizobium inoculation on Chickpea at AAU; assessment of challenges for the adoption of improved forage species by BDU; integrated pest and disease management and nodulation rate of Faba bean at JU; and the impact of climate change on migration of crops and their environmental suitability in Southern Tigray by MU.

Innovation recommendation mapping

Innovation recommendation mapping to support local agricultural development planning and scaling of innovations to best fit agroecological zones has been piloted. In 2019, the activity focused on technical skill development with two centres of excellence (Mekelle and Addis Ababa Universities) in the domain of data, script writing procedure and tool development. The preparation of seven IRM maps have been complete for scaling technologies of regionally-prioritized commodities (wheat, faba bean, food barley, soya bean, and malt barley) in 10 selected woredas (See sample suitability maps in Figure 1). The programme has won the prestigious international award - the Olam 2019 prize for innovation in food security with fund grant of 75,000 USD to further develop the approach. Since then, the Olam deputy director paid a visit to BENEFIT to discuss possible future collaboration with WUR to expand the experience to other countries. In the remaining time, IRM will focus on the institutionalisation of the approach in Ethiopian soil resource institute (ESRI) and continuity will be ensured by the REALISE programme which plans to conduct IRM in 5 Woredas with the option of a further scaling in 2020.

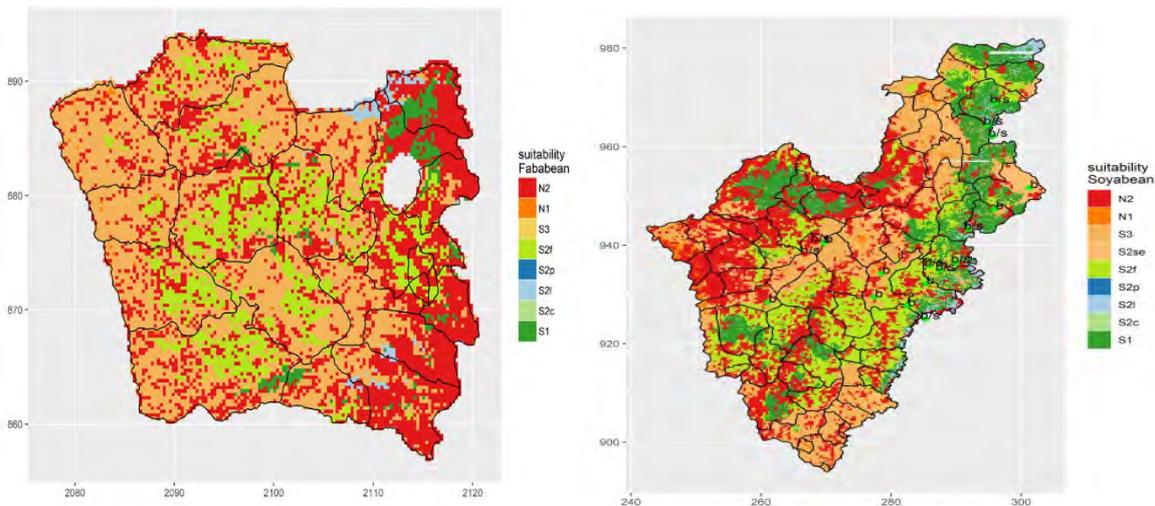


Figure 1 Examples of the suitability maps produced in 2019. Faba bean in Ofla woreda-Tigray (left), and soya bean in Limu Seka woreda-Oromia (right)

Increase capacity of woreda to develop and implement agricultural plans, including strategies for scaling

Capacity of extension to disseminate best-fit technologies through implementing scaling strategies enhanced

Training of Trainers and cascading of training

Developing the capacity of AGP stakeholders is one of the major activity components of CASCAPE. In 2019, the focus was on cascading of the Training of Trainers (ToTs) that have been provided based on the training need assessment conducted in 2016. Accordingly, AGP financed the cascading of ToTs to train 29,594 experts, DAs and farmers in 65 intervention woredas which is way above the target plan

for the reporting period. While at the same time, CASCAPE cluster teams conducted ToTs to train 656 SMSs and DAs (Table 8). The ToT topics included innovation pathway approach as validated by CASCAPE; validation protocol and scaling strategies; best fit practice manuals development skills; data analysis and scientific paper and policy brief writing; reclamation of acidic soils; improved agronomic practices, nutrition-sensitive agriculture and home gardening approaches; gender sensitive agriculture and fodder crop production and managements. In addition, in-house training on R statistical software to cluster experts was given from NPMU. In anticipation of institutionalization of the training and capacity development approach, a manual was drafted to be shared with the extension directorate and regional BoAs. As part of the ToT cascading activity with farmers, CASCAPE experts and woreda SMS were able to carry out on-spot training with 3,478 DAs and farmers in 2019.

Table 8 Number of extension experts (SMS & DAs) and farmers trained by CASCAPE and cascaded by AGP in 2019

University cluster	No. Trainees		
	ToTs to SMS & DAs	ToTs given by AGP - MoA to SMS, DAs and Farmers	On-spot training to farmers
Addis Ababa	252	22,529	236
Bahir Dar	0	1,474	710
Hawassa	129	1,147	374
Jimma	195	2,382	2038
Mekelle	73	2,062	120
NPMU	7	--	--
Total	656	29,594	3478

Support development and implementation of agricultural woreda plans

In 2019, regional teams were involved in the revision and fully participated in the planning process in 57 woredas. Mekelle University prepared woreda plan preparation manual in Tigrinya for use by the woreda SMSs and officials. Because planning starts at from household level, Bahir Dar University took the planning advice down to Kebele and households. Awareness creation and capacity development on how to prepare a good development plan was among the areas of support by the CASCAPE team. Where possible best fit practices, gender, nutrition and environmental concerns were integrated into the plans.

Diversified agricultural products are made available

Demonstration and promotion of home gardening and fruits

With an effort to diversify household diet that is predominantly cereal-based by including fruits, vegetables and pulses, model home gardens were established. In the reporting year alone, 337 home gardens were established that included seven different type of vegetables (cabbage, lettuce, Ethiopian kale, Swiss chard, Collard greens, carrot, red beet and some fruit trees (avocados, mangoes) to bridge the nutrition gap (Table 9). These gardens are meant for home consumption and women were trained on establishment and management of the vegetable gardens in collaboration with CANAG project. ToTs were organized for DAs to train women on seed bed preparation, vegetable production, consumption and preservation.

Table 9 Home garden activities by university cluster

University cluster	No of home gardens	Nutrition dense crops promoted
Addis Ababa University	80	Swiss chard, carrot, red beat, Ethiopian kale, cabbage, and Collard green
Bahir Dar University	36	Swiss chard, carrot, head cabbage, beet root, and lettuce Mango and avocado
Hawassa University	42	Carrot, head cabbage, and beet root
Jimma University	100	Swiss chard, carrot, kale, lettuce, and head cabbage
Mekelle University	79	Sweet potato, Swiss chard, cabbage, lettuce, and carrot
Total	337	

Demonstration of pulse-based food preparation & utilization

The field crop-based nutrition activities included demonstration of chickpea, soya bean, faba bean and mung bean that are protein rich crops; on the other hand, the crops are both nutritious and are source of cash income. Mekelle and Jimma clusters have organized pulse-based food preparation and food exhibition activities in 2019. Jimma University conducted soya food processing and food recipe training in several rounds that reached 388 participants (234 farmers, 52 DAs, 92 health extension workers, and 10 experts) from three different woredas in Jimma. In collaboration with CANAG, AGP, Alive and Thrive, REST and Sekota Declaration, Mekelle University cluster organized food fair exhibition in Ofla woreda with the aim of familiarization and awareness creation on preparing diversified food stuff from pulses, and preservation and utilization by local farmers. This lasted for two days and involved more than 500 farmers, 17 DAs, and more than 150 teachers, woreda experts and regional heads.

Nutrition assessment, Nutrition Education and Behavioural Change Communication

Nutrition education and behavioural change is mainly the responsibility of CANAG but it is implemented by the CASCAPE experts (agronomists and socioeconomics per cluster). The activity involved diet diversity (diet diversity score – DDS) assessment manual that help to understand intra-household food distribution and gender dynamics followed by training. The Social Behavioural Change Communication (SBCC) document that includes production, consumption, and preservation being developed by Mekelle and Hawassa teams. This bases on the SBCC document prepared by the Food and Nutrition Coordination Office (FNCO) of MoA that mainly focuses on the production. Because FNCO prohibited the use of other materials in the country, the undertaking is in close consultation with the office. The DDS survey is intended to cover dry season, wet season and fasting season dietary diversity of the community. Since the full inception of CANAG was in 2019, materials were purchased and wet season data is collected, analysed and the report is already submitted. The dry and fasting season will follow soon.

Mainstreaming social inclusion and nutrition

Both women and men have role in agricultural production and food security at household level. The social inclusion and nutrition activities carried out were based on the realisation of (i) increasingly predominant role of women in agriculture, food security and nutrition; (ii) the need to reverse negative and persistent impacts of all forms of malnutrition and the need to promote nutrition at the household level; and (iii) the serious challenges posed by rural youth unemployment and exclusion. Therefore, gender mainstreaming has been given due consideration with targets of 30% female-headed household participation in all aspects of activities. The overall achievement of female participation in 2019 is 27 and 82% in nutrition sensitive agriculture, although some clusters such as Mekelle University achieved 35%. However, because of the cultural barriers that exist in the society, we could not achieve our overall target. Regarding nutrition, activities focussed on female farmers and the participation of women in home gardening, food exhibition, field days, nutrition and behavioural change communication trainings was 100% and the overall rate of female participation in all other nutrition-sensitive agriculture activities was 62%. The capacity building training for experts and researchers targeted both women and men with female participation of 16%. In the testing and validation activities, a no-harm effect on women for a practice to be qualified as best-fit practice. The validation protocol also integrated gender and nutrition dimensions as criteria for evaluation of technologies in screening process.

At BDU, together with ISSD, we undertook a gender gap analysis survey on Addisalem potato producer cooperatives using Harvard gender role analytical framework (Ludget, 2016)⁴ in Farta woreda. The data generated highlighted the roles of men and women in potato production, marketing and income distribution at household level. According to the result, both men and women work together on most of the potato production activities. However, the men get more training compared to the women. This is because of the culture prevailing in most rural communities that the men have to get involved in activities that matter the most for the household. JU gave ToT on gender sensitive agriculture for 39 participants including 13 woreda officials and 4 zonal officials.

⁴ N. Ludget, 2016. Integrating Gender and Nutrition within Agricultural Extension Services. Feed The Future Info Sheet: Common Gender Analysis Tools (2).
https://www.agrilinks.org/sites/default/files/resource/files/ING%20Info%20Sheet%20%282016_09%29%20%20Harvard%20Analytical%20Framework%20%28Ludgate%29.pdf

Testing labour saving technologies

In order to ease the heavy workload on women and children, disseminating labour saving technologies and no-harm effect of best fit practices are among the approaches adopted in CASCAPE. Clusters have identified appropriate labour saving technologies suitable in their respective regions. These include improved stoves and solar panels by AAU; potato harvesters by BDU; Enset scraper and improved stoves by Hawassa university; bags to speed up fermenting of Enset, milk churner and improved stove by Jimma university; maize sheller, water fetching pulley, and improved stove by MU. Procurement procedure and finance process of the universities has been a major bottleneck for efficient delivery of the required items.

Conclusions and recommendations

Achievements

- The programme reached 888,176 farmers of which 92,261 are reached directly through testing/validation, pilot scaling, PED activities, and field days and the rest is by means of scaling support to AGP, organic scaling and media broadcast of best practices;
- 29 best fit practice manuals (15 new and 14 revised) were prepared and submitted to the extension directorate of which seven are already incorporated in the extension package for model farmers to be implemented in 2020 growing season;
- Validated best fit practices covered 224,161 ha of farmland which included reach of best practices through organic scaling in 57 woredas enabling significant increase in the yields (>50%) of major crops (wheat, maize, teff, barley, potato, etc);
- AGP financed the cascading of ToTs to train about 30,000 extension staff (SMS and DAs) to enhance their technical skills and knowledge to disseminate demand-driven technologies. In addition, new ToTs were provided for 656 experts and on-the-spot training was provided for 2357 farmers involved in CASCAPE pilot scaling and PED activities;
- 337 home gardens were established that included seven different type of vegetables and 390 women were trained in home garden management;
- Seven innovation recommendation maps were prepared and technical skill development series of trainings were provided;
- Research-Extension university linkage and PAR approach is successfully institutionalized.

Challenges, opportunities and lessons learnt

Challenges

- Security issues concerns in some regions such as SNNPR because of the referendum in Sidama Zone and unrest in Oromia regions restricted mobility;
- Staff and DA turnover and reshuffling of government officials created instability in institutional linkages. Many project staff have also left in search of better options and job security;
- Limited access and availability of good quality seed, finance (institutional credit), and markets for produce (with high yielding varieties such as potato) are important scaling challenges;
- The onset and cessation of rainfall was also problematic as the late start delayed planting in some regions and the prolonged rain affected crop harvest;
- Pest and disease prevalence; improved crop varieties in production become susceptible to new strains of leaf and stem rust (mainly wheat), chocolate spot (faba bean) and potato late blight.

Opportunities

- Institutionalization of approaches; e.g., our BFPM becomes part of the regular extension;
- Excellent partnership with EIAR, RARIs, MoA/BoA and AGP who are now looking to CASCAPE for innovative approaches and ready to take up results;
- The presence of federal and regional research centres in intervention areas;
- The emerging opportunity of market; e.g., for malt barley, soya bean, improve seed produced by farmers group;
- The presence of BENEFIT partner programmes and other stakeholders in project areas for collaboration;
- Improved knowledge of SMS and DAs that enhanced the uptake of best fit technologies;
- The potential demand for modern machineries such as tractors, row planters, harvesters, etc;
- The presence of multipurpose cooperatives in all regions.

Lessons learnt

- Technology alone is not a sufficient condition for successful uptake of best practices – input supply (e.g., seed and agrochemicals market linkage and input supply) are also important for technology uptake by farmers;
- The involvement of CASCAPE experts in the woreda development planning process facilitates the inclusion of validated best practice within the woreda agricultural plans;
- Participation of research and extension stakeholders in the project annual review and planning workshops first at regional level and then at national level sensitizes stakeholders about interventions and project outcomes, and creates a favourable condition for the alignment and collaboration at all levels;
- Farmer field days become important vehicle to familiarize farmers and stakeholders about technologies and best practices and attracts media attention (television radio dissemination). But it is most effective when organized jointly with relevant stakeholders (extension, RARIs, BENEFIT partner programmes such as ISSD and SBN) than unilaterally by CASCAPE;
- Provision of trainings based on the competency level of the target group improves uptake. However, training that followed participatory learning, increases participants' interest on the trainings;
- Close supervision at all level contributes for the success of validation, pilot scaling, PED and scaling support activities.

Way forward

- Continuous effort will be made to incorporate the BFPs into national extension package;
- Institutionalisation of IRM tools and approach into ESRI;
- Capacity development using piloted participatory training approach;
- Revise MoA's scaling manuals based on the results and outcome of the scaling process M&E study;
- Finalize remaining manuscripts for scientific publications;
- Support the development of crop and soil-specific blend fertilizer recommendations in different agroecologies.

Improved enabling environment

Regional and national policy makers make informed decisions about agricultural research and extension opportunities and challenges

Prepare policy briefs, scientific papers and research book that support decisions

Policy briefs prepared

Based on in-depth studies, surveys and case study results, policy briefs to share key messages to higher officials so that they make informed decisions at national and regional levels about agricultural sector development were prepared and disseminated. In 2019, the project prepared seven policy briefs focusing on soya bean value chain (Jimma university cluster), malt barley value chain (Hawasa university cluster), papaya innovation (Mekelle University cluster) and fodder cut and carry system (Bahir Dar University). In addition, Mekelle university cluster has prepared and distributed three policy briefs on integrated soil fertility management, sesame yield gap assessment and green banking. The policy briefs were shared with officials during field excursion and policy dialogue meetings (Table 10).

Table 10 List of policy briefs prepared by clusters in 2019

No	Title	Cluster
1	Cut and carry system: to combat land degradation in the highlands of Ethiopia but there are constraints for its adoption	BDU Cluster
2	From where to where malt barley in Southern Ethiopia	HU Cluster
3	Enhancing Soya bean value chain to bring nutrition security and environmental sustainability	JU Cluster
4	Improving rural livelihood through papaya innovation in the Northern Ethiopia	MU Cluster
5	Soil fertility management in the Northern Ethiopia	MU Cluster
6	Sesame yield gap assessment in the Northern Ethiopia	MU Cluster
7	Green banking in the Northern Ethiopia	MU Cluster

Publications

Documentation and scientific paper writing to share project results with scientific community and technocrats was among the focus area of activities in 2019. Accordingly, the project managed to publish seven scientific papers in peer reviewed international journals and seven more manuscripts were submitted and currently under peer review process. Moreover, data analysis and report writing are undertaken for eleven more papers making the total scientific papers 25 (Table 11). Furthermore, Jimma and Mekelle clusters took ambitious steps to document CASCAPE experiences from 2011- 2019, this resulted in legacy books, which are currently at draft stage. In addition, Mekelle university cluster prepared a research book which focuses on the best fit practices activities from 2016- 2019. Draft capacity development manual also has been developed and the required supportive illustrations were also completed.

Table 11 List of published and drafted papers based on CASCAPE activities

S.N	Title	Author(s)	Status	Journal
1	Explaining bread wheat (<i>Triticum aestivum</i>) yield differences by soil properties and fertilizer rates in the highlands of Ethiopia	Eyasu Elias, Peter Okoth & Eric M.A. Smaling	Published	Geoderma, vol.339 https://www.sciencedirect.com/science/article/pii/S0016706118313041
2	Soil organic matter depletion as a major threat to agricultural intensification in the highlands of Ethiopia.	Christy Van Beek, Eyasu Elias, Yihenew G. Selassie, Girmay Gebresamuel, Asrat Tsegaye, Feyisa Hundessa, Mekonnen Tolla, Melkamu Mamuye, Gebremeskel Yemane & Seyoum Mengistu	Published	Ethiopian Journal of Science and Technology, vol.11(3) https://www.ajol.info/index.php/ejst/article/view/184733
3	Selected chemical properties of agricultural soils in the Ethiopian highlands: A rapid assessment	Eyasu Elias	Published	South African journal of plant and soil, vol.36(2) https://www.tandfonline.com/doi/abs/10.1080/02571862.2018.1506829
4	Characteristics of nitisol profiles as affected by land use type and slope class in some Ethiopian highlands.	Eyasu Elias	Published	Enviromental systems research, vol. 6 https://environmentalsystemsresearch.springeropen.com/articles/10.1186/s40068-017-0097-2
5	Soil nutrient balance under diverse agroecological settings in Ethiopia.	C.L. Van Beek. E. Elias. G.S. Yihenew. H. Heesman. A. Tsegaye. H. Feyisa. M. Tolla. M. Mamuye. Y. Gebremeskel. S. Mengist.	Published	Nutrient cycling in Agroecosystems, vol.106(3) https://link.springer.com/article/10.1007/s10705-016-9803-0
6	Soil Classification in Yigossa Watershed, Lake Tana Basin, Highlands of Northwestern Ethiopia Soil Classification in Yigossa Watershed, Lake Tana Basin, Highlands of Northwestern Ethiopia Soil Classification in Yigossa Watershed, Lake Tana Basin, Highlands of Northwestern Ethiopia Soil Classification in Yigossa Watershed, Lake Tana Basin, Highlands of Northwestern Ethiopia Soil classification in Yigossa Watershed, Lake Tana Basin, Highlands of Northwestern Ethiopia	Gizachew Ayalew, Yihenew G. Selassie, Eyasu Elias & Christy Van Beek.	Published	Journal of Agricultural science, vol.7(1) http://www.ccsenet.org/journal/index.php/jas/article/view/39809
7	Mapping the major soil-landscape resources of the Ethiopian Highlands using random forest	J.G.B. Leenaars, E. Elias, J.H.M. Wösten, M. Ruiperez-González, B. Kempen	Published	Geoderma https://doi.org/10.1016/j.geoderma.2019.114067
8	Short term improved fallows of <i>Tephrosia vigoli</i> and <i>Cajanus cajan</i> enhanced maize productivity and soil chemical properties of a degraded fallow land in south western Ethiopia.	Melkamu, Gezahengn, & Eyasu	Resubmitted	Journal of Agroforestry
9	Determinants of smallholder farmers decision on technology use for cereal crops in the Ethiopian highlands	Tewodros, Eyasu, & Irene	Submitted	Journal of agriculture & environment for international development
10	Determinants of smallholder farmers decision on fertilizer use for cereal crops in the Ethiopian highlands	Tewodros, Eyasu, & Christy	Submitted	Experimental agriculture

S.N	Title	Author(s)	Status	Journal
11	Effect of blend fertilizer application in yield and yield components of bread wheat on nitisol in south Ethiopia	Eyasu, Beyene, & Tewodros	Submitted	Journal of Soil and plant. Japanese Soil science society (Taylor and Francis)
12	Soil nutrient status and fertilizer recommendation in the highlands of southern Tigray, northern Ethiopia. (Book chapter to be published in Springer)	Girmay, Yemane, Eyasu, & Amanuel	Submitted	Springer
13	Mapping recommendation domains of agricultural innovations: district-level multi-criteria fuzzy modelling for Ethiopia	Farrow, & Walvoort	Rejected to be submitted	
14	Integrated fertilizer application improves soil physico-chemical properties and yield of maize (<i>Zea mays</i>) in Northwestern Ethiopia	Workineh, Matebie, Yihenew, Eyasu, Romkens, & Eric	Submitted	Heliyon
15	Crop migration: altitudinal shift of key crops in response to climate change in southern Tigray, northern Ethiopia.	Girmay, Haftu, Haftom, Eyasu, & Nyssen	Draft Stage	
16	Response of food barley (<i>Hordeum Vugarae</i>) to blended fertilizer rates on Alisols in southern highlands of Ethiopia.	Beyene, Eyasu, Desalegn, A, & Tewodros	Draft Stage	
17	Variability in Vertisol and effect on crop yield	Eyasu, Gizachew, & Eric	Draft Stage	
18	Response of bread wheat to blend fertilizer application in north western Ethiopia.	Eyasu, Gizachew, Abebe, & Yihenew	Draft Stage	
19	Inter row spacing and seed rate for sesame	Girmay et al.	Draft Stage	
20	CASCADE approach paper	Eyasu, Akalu, & Eric	Draft Stage	
21	Innovation recommendation mapping: an innovative approach in support to local level agricultural development planning in Ethiopia	Amanuel, Atkilt, Tomaso, Desalegn, H, Ermias, Eyasu, Farrow, Girmay, Gudina, Eric, & Snel	Draft Stage	
22	Evaluation of phosphorous sorption capacity and external phosphorous requirement of acidic soils of the south western highlands of Ethiopia.	Berhanu & Eyasu	Draft Stage	
23	Response of bread wheat (<i>Triticum aestivum</i>) to Blended fertilizers on Leptosols in Girar Jarso, Central highlands of Ethiopia.	Mohamed, Abate, Eyasu, & Eric	1 st draft	
24	Chickpea postharvest loss assessment in central highlands of Ethiopia.	Desalegn, Abate, & Eyasu	1 st draft	
25	Determinants drivers and inhibitors of technology farmers	Nina, Eyasu, Akalu, Amleset, Abate, & Naud	1 st draft	

Share project results, in-depth studies, and policy briefs with stakeholders for uptake of agricultural practices and technologies

Stakeholder meetings, platforms and media coverage

The programme links field level experiences with higher level policy at regional/national levels. In 2019, series of national and regional research and extension stakeholder meetings were organized. In such meetings participants are drawn from RARIs, BoA, MoA, ATA and NGO projects as appropriate. At

national level, stakeholder meetings focused on integrated soil fertility management strategies, review of 2018 results and plans of 2019, and high-level policy dialogue on D4A and extension approaches. In the regions, the cluster teams have also organized series of stakeholder meetings to share plans for alignment and joint ownership and results for use in the decision making at regional level. In these meetings, papers reports, policy briefs and related documents are actively shared with the stakeholders. In addition to meetings, the project also supports platforms such as malt barley platform in Tigray and two Agricultural Development Partners Linkage Advisory Council (ADPLAC) meetings at national levels researchers, extension workers, input suppliers and traders meeting to discuss and find solutions to common problems. The seconded senior extension expert to the MoA is actively engaged in supporting the extension directorate to organize ADPLAC meetings.

EIAR-MoA-CASCAPE joint workshop was organized to evaluate the results of large-scale joint demonstration of agricultural technologies based on the PAR approach. The platform that was established to work towards strengthening collaboration and linkage between extension, research and higher learning institutes. The platform meeting was attended by over 70 experts and relevant stakeholders including MoA State Minister, EIAR Director General, presidents and deans of universities. The platform was relevant to appreciate and recognize the first attempt towards large scale full package demonstration to identify factors that affect scaling potential and promote sustained large-scale scaling of technologies that can transform the agriculture sector.

The project also uses mass media including national (ETV, WALTA, etc) and regional TVs (DW TV in Tigray, ATV in Amahara, South TV, and OBN in Oromia) and FM radio to broadcast and disseminate key messages and field based experiences to a wider national and regional audience. Some examples of the media coverage include the validated approaches such as PAR, cluster farming, innovation pathways, etc., and farmers' field days. A video documented the experiences of Bahir Dar, Mekelle and Jimma clusters but budget limitations for airtime did not allow the programme to be disseminated in TV or radio.

Organize policy dialogue and exposure visit for officials

High level field visit

Agricultural Commercialization Clusters (ACC) was introduced by ATA during AGP as a mechanism to integrate farms to grow geographically targeted high value commodities. AAU introduced wheat clustering approach in Siyadebirna Wayu Woreda. NMPU, in collaboration with the extension directorate of the MoA has organized a high-level field visit to showcase the successes achieved with wheat cluster farming as a scaling approach in North Shewa zone. The participants visited seed multiplication and scaling activity using cluster farming approach. The field visit was attended by over 200 participants including dignitaries from the Federal MoA (State Minister Advisor, extension director, crop director, mechanization director, AGP head), zonal and woreda administration officials, the offices of the woredas agriculture, research institutes representatives, farmers, BENEFIT staff and the media. The agriculture standing committee of the members of the parliament was also invited but they could not make it due to an urgent government assignment.

Mainstreaming social inclusion

As pointed out in the section above, gender mainstreaming and social inclusion is an important pillar in all aspects of CASCAPE activities. In all the activities held in 2019, the participation of women was considerable. With regard to the enabling environment, the project is encouraging the participation of female officials who are key partners and participants of the project activities at national level. Female officials in the university clusters, RARIs and BoAs are active participants of the project activities. However, the proportion of women experts in the project itself is limited particularly among the cluster experts. In the future, attention should be given for gender balance in the professional mix of experts in such projects.

Conclusions and recommendations

Achievements

With regard to creating enabling environment, we made significant progress in terms of informing regional and national policy makers about successful experiences and best practices. These was achieved by means of series of meetings, workshops, platforms as well as scientific publications, policy briefs and mass media outreach. The project organized 12 stakeholder workshops/meetings, high level policy dialogue and field excursion and series of media briefings.

Challenges, opportunities and lessons learnt

Challenges

- Difficulty to get higher government officials and administrators attending platforms and meetings;
- Security issues around Oromia, South and some parts of Amhara has restricted mobility;
- Lengthy publication process, limited scientific writing skills among experts and limited experiences to thresh out innovative ideas and nobility out of the project results to be shared with national and international audience;
- Turning data into information and information into knowledge to share with policy and scientific community requires a lot of experience and hard work.

Opportunities

- Plethora of data and information is available that can be turned into knowledge such as scientific publications and legacy books;
- Research and extension stakeholders and policy makers have high regard for CASCAPE and are willing to adopt its recommendation and advices;
- Policy makers have now recognized the importance of research and scaling for development more than ever.

Way forward

- Finalize draft manuscripts into scientific publications;
- Finalize legacy books of Jimma and Mekelle universities into usable materials;
- Finalize capacity development manuals with input from WUR;
- Together with BENEFIT, organize project end workshop;
- Work with the extension directorate how to implement the recommendations of D4A survey results;
- Organize policy dialogue meeting to inform policy makers on policy relevant issues generated by the project;
- Buy national TV and radio air time to broadcast outcomes to the public.

Collaboration

M&E and communication

As 2019 is the final full year of the second phase, documenting project outcome has been a major effort. On regular basis, the M&E focal persons collect both quantitative and qualitative data have been documented in reach tables with indicators (e.g., number of farmers reached, hectares of farmland covered with BFPs, people trained, etc). CASCAPE management teams were also backstopping the cluster at different time. In addition, with the assistance of the communication expert, selected best practices and success stories were documented e.g. for dairy goat and papaya (Mekelle cluster). Due to late harvesting, data are still to be compiled. When finalized, the results of M&E studies will be shared with regional stakeholders by means of progress report, and newsletter prepared by BENEFIT partners.

With regard to some in-depth study, scaling process evaluation and training outcome assessment were carried out. Quantitative and qualitative data collection on selected commodities, encoding and analysis is complete and write up is well underway. In addition, outcome level assessment was conducted for which we have developed a framework to monitor and evaluate the impact of scaling of BFPs. The objectives in sight was to understand and highlight the enabling and hindering factors for successful scaling of the BFPs and cascading of ToTs. The project uses different channels to disseminate M&E data including national and regional planning meetings, field visits, stakeholder workshops and mass media.

Collaboration

Collaboration with BENEFIT programmes

Within the BENEFIT partnership, CASCAPE has worked closely with ISSD, REALISE, SBN and ENTAG in the place product combinations in four regions. In the framework of this collaboration, Jimma University team has been collaborating with BENEFIT partners (ISSD & ENTAG) on the soya bean value chain development. Capacity building trainings for cooperative members and soya bean seed producing farmers groups were organized in 2019. Similarly, Hawassa University team and ISSD collaborate on malt barley seed and grain production and marketing activities aimed at strengthening seed and grain value chains and contribute to food and nutrition security of rural households. Mekelle University team on the other hand, collaborated with ISSD and SBN to carry out training on sesame seed production, financial literacy, awareness creation on environmental degradation and scaling of sesame variety (Setit-2). Moreover, training on malt barley seed and grain production, cooperative management for executive committee members and contract farming for cooperative members was organized by CASCAPE, ISSD and REALISE in southern Tigray. Likewise, the BDU team collaborated with ISSD on food and malt barley and potato value chain development in Farta District. BENEFIT collaboration is very weak in fact non-existent in Addis Ababa university. It was planned that AAU collaborates with ISSD on chickpea value chain development in Becho area but this has not been practical because ISSD is not working in Becho district. In all other regions, CASCAPE cluster managers are in charge of coordinating collaborative/synergistic activities. Extended reports on the joint activities and roles and responsibility of each sister project is separately reported. At national level, CASCAPE and REALISE are collaborating on soil characterisation mapping in 60 low PSNP woredas. We are sharing the successful experiences gained in CASCAPE in terms of soil survey, cauterisation and mapping approach. By the decree of the state minister of MoA, CASCAPE serves in the national task force established for soil mapping under ESRI including the joint REALISE-CASCAPE collaborative work.

Collaboration with other projects and partners

In 2019, the main joint activity was cascading ToTs to kebele level with AGP finance. This went exceptionally well enabling the training of many DAs and farmers. In addition, CASCAPE is a member of the national and regional technical committee of AGP while the AGP coordinators serve as institutional advisors in CASCAPE. That way, activities are aligned and synergistic. With CDSF, CASCAPE collaborated to translate selected BFPs into simplified extension training materials including ETMs, posters, and laminated charts in local language. At Mekelle University, CASCAPE and ISSD are both collaborating with Global malting Service (GMS), a private consulting firm, to

demonstrate and improve malt barley seed and grain production and marketing in Southern Tigray. GMS is a global consulting firm working on malt barley in Ethiopia and is consulting Raya Beer Factory on production and supply of malt grain barley. GMS was actively engaged in evaluation of malt barley varieties which has been under demonstration by CASACPE and ISSD. With regard to nutrition, Mekelle University was collaborating with Alive and Thrive, REST (relief society of Tigray, a local NGO) and Sekota Declaration that were involved in food exhibition demonstrating how to process and utilise pulses, potato and other field crops. Furthermore, the Global Alliance for Improved Nutrition (GAIN) and the Mekelle University cluster started discussion to explore possibilities for papaya processing, like drying, powdering in Southern Tigray region, where we have been working on improved papaya production.

Collaboration with Dutch private sector

As many Dutch companies are engaged in marketing and not on production activities, there is almost no functional collaboration between CASCAPE and Dutch private sector.

Mainstreaming social inclusion & nutrition

In all project activities, efforts are being made to have a fair representation of women so that they benefit from the collaboration activities. But the degree of female representation varies depending on the type of activity. Some activities such as soya bean processing that are implemented by Jimma CASCAPE and ISSD are women targeting activities in which female representation is almost 100%. In the papaya production and marketing youth group that are supported by Mekelle CASCAPE, the participation of women is almost 50%. Overall, the aim of the Tigray BENEFIT collaboration is primarily to improve production and productivity of sesame and malt barley. Similarly, gender and nutrition working group among the BENEFIT Partnership projects was established in BDU cluster to strengthen the current efforts of the projects to mainstream gender and nutrition in their project activities. The working group helps to institutionalize gender and nutrition in BENEFIT Partnership and to create a bridge between all gender and nutrition practitioners in partnership. This Working Group planned to meet quarterly.

Transferring responsibilities and ownership

In the second phase of the project, CASCAPE was given clearly defined role within AGP and there was direction to have ownership from among the research and extension stakeholders for all project activities. In AGP, the role of CASCAPE was to develop innovative ways of identification, documentation and validation of best-fit practices and develop simplified practicable scaling strategies. It was agreed at all levels that scaling is not the responsibility of CASCAPE but that of extension with support of AGP. But the project is mandated to do scaling support activities e.g., capacity building, M&E, follow up support after BFPMs are handed over. Regarding testing, validation and PEDs, a clear understanding has been created from the very beginning that all testing and validation activities are owned by the RARIs who are mandated to carry out these activities in the country. In order to mainstream CASCAPE innovative pathways and approach, 2-3 RARIs staff are working with CASCAPE a part-timers. This is believed to bridge the knowledge and skill gap and mainstream project piloted activities. Ultimately, EIAR and RARIs are the owners and are fully responsible to continue testing & validation activities. In the same manner, the extension directorate and BoAs are responsible to continue enhancing the technical capacity of experts and DAs with support from AGP. CASCAPE has had clear agreement that for all ToTs it is implementing, AGP agreed to cascade them to woreda and kebele levels. To help them with these activities, the project has prepared capacity development manual. In addition to the manual, eight pager brief summary of the document was prepared to facilitate institutionalization of CASCAPE's capacity development approach. Hence, programme activities are well-aligned and integrated within the nationally mandated institutions and projects.

Conclusions and recommendations

Achievements

Ownership and transfer of responsibilities of all project activities has been built in from the very beginning and therefore transferring and phasing out would be less of a problem. However, follow up support and capacity building for the incorporation of BFPs in the national extension package and

uptake by farmers is still needed. To this effect, training manual developed based on CASCAPE innovative training approach would be crucially important.

Challenges, opportunities and lessons learnt

Challenges

- Annual workplan was loaded and ambitious, which at times lead to high workloads and stress for cluster and national staff. A team spirit workshop in Kenya was held, partly to release the tension;
- The project has been making regular record of M&E data based on the ITTs, but this remains incomplete because of late harvesting which is not aligned with the annual reporting period;
- Inconsistencies occur at times between ITT and Reach data, pointing at a need to keep training local and national staff in data collection and analysis;
- It was difficult to get all collaborative activities going at the pace that the regular CASCAPE project activities show;
- Lack of funds to support CASCAPE-RARIs joint research although proposals were submitted;
- Distance in working stations among the BENEFIT partners. e.g. between SBN & Mekelle cluster;
- Persistent problems on seed and (to a lesser extent) fertilizer availability and high turn-over rate of trained personnel at woreda and kebele level.

Opportunities

- Collaborative activities serve as experience sharing forum between sister projects and beyond;
- The availability of scalable local seed business experience of ISSD and best agronomic practices in CASCAPE;
- The great interest and support of EKN to promote collaborative activities for better image, visibility and impact;
- Successful partnership experiences with AGP, RARIs and MoA/BoA;
- The growing interest of other projects and institutions such as ATA, GIZ, GAIN, CDSF to scale up results;
- Excellent institutional relations with EIAR in recent years;
- The availability of M&E and ToT manuals and guidelines;
- Soil survey and mapping experiences and skills developed;
- Most BENEFIT partner programmes are hosted in the same universities (e.g., in Mekelle, Hawassa and Bahir Dar that host both CASCAPE and ISSD);
- The growing appreciation and respect given to BENEFIT partner programmes among research, extension institutions and universities.

Lessons learnt

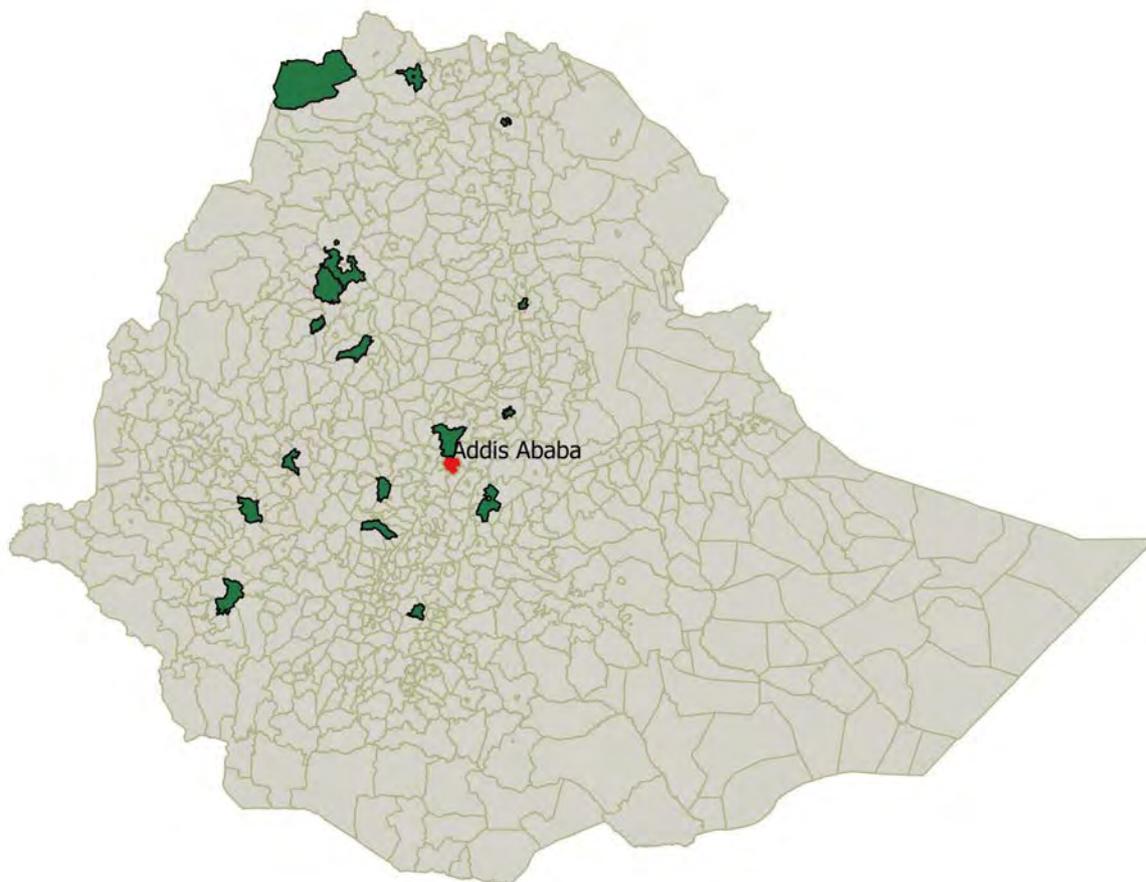
- Collaboration avoids duplication and competition and fosters synergy and complementarity;
- BENEFIT projects considered as working in a team and with the same objective;
- For collaborative activities to be successful it needs clear framework and action plan with well-defined roles and responsibilities among stakeholders;
- Planning phasing out strategies beforehand facilitates increased ownership and transfer of activities to mandated institutions.

Way forward

- Establish consistency between ITT data and reach data reported Finalize ToT manuals and disseminate among partners;
- A feedback system needs to be put in place both at BENEFIT and cluster level;
- Periodic meeting for reviewing progress and performance is critical between partners.







Executive summary

Introduction

The Ethiopia-Netherlands Trade for Agricultural Growth (ENTAG) Program has been supporting agribusinesses & entrepreneurs operating in Ethiopia. At impact level, ENTAG aims for improved sustainable food, income, and trade among rural households in Ethiopia. ENTAG Ethiopia's goal is to increase agribusiness productivity, trade and foreign direct investment by strengthening the private sector in working more effectively with smallholders in applying new technologies and accessing finance for investment purposes. The ToC of the Program is based on the following three primary outcomes:

1. Increased demand for and use of ENTAG's market information services, and provision of hands on support to both domestic and foreign entrepreneurs/investors in selected sub-sectors;
2. Enhanced performance of selected sub-sectors; raise the volume and value of trade in domestic and high-value international markets;
3. Attracted and engaged companies to pursue more inclusive and sustainable value chain development.

ENTAG has chosen few priority sectors for its intervention. These sectors are Aquaculture, Legumes, Poultry, Spices, Sesame, Dairy and Potato. The main components of the Program activities namely are: Front Office & hands on technical support; Inclusive Business Models; Subsector platforms; Agribusiness Innovation Fund; Support of Private Sector Associations (PSA) and B2B linkage & Match making.

Major achievements

Increased quantity and quality of sustainable agricultural production

- Two ENTAG Innovation Fund grantees have completed project implementation. The first innovation fund project is packing national food varieties (semi-processed and fully processed) with a food-grade packing material & labelling and has been successfully implemented in 2019. The project helps supply national foods to local supermarkets and export markets without losing the original taste. The second project is an innovative and patented product called Calcium Supplement for livestock, which improves and maximizes the efficacy of animal feed and health, and productivity of poultry and livestock. The product is produced scientifically and hygienically with minimal human contact and packed with quality packing material. Both innovations are proved approaches that can be scaled up countrywide and contribute towards increasing the quality of products supplied for human and animal consumption.
- In 2019, 106 new graduates have been placed to agribusiness companies as part of ENTAG's Internship program. This is a 212% achievement from what has been planned for the year. The total number of interns assigned to agribusiness companies was 189, which is 126% of the overall plan. A total of 65 interns (48% of the total interns who have got placements) got a job opportunity in 2019, of these new jobholders 37 got jobs at their host companies and the remaining 28 at other companies through networking. The total number of interns provided with permanent job opportunities reached 77, of which host companies employed 47 interns while the remaining 30 are employed at other agribusiness companies. Through the internship program of ENTAG, 44 companies have been supported by placing agribusiness graduate interns in their team. This intervention has helped companies increase their in-house theoretical knowledge and increase their efficiency in production as all the placed interns are of agriculture or related backgrounds.
- Identification of the actual major causes and the integrated management technologies for the ginger disease outbreak that devastated 85% of the total production of the country and putting the country ginger export to nil. Following this, the management approach was validated in wider varied pilot areas by relevant research centres and the validated approach incorporated in the extension system. This has resulted in improved production quality and quantity of ginger.
- A manual has been developed to address "Fish Products Handling and Quality Control (Simple Guide for Fishers, Fish Farmers, and Traders)" and is aimed to improve existing low level of fish products quality at landing sites and markets.

Improved market and trade

- Export market linkage of 1617Mt of turmeric bulb and finger (1,575MT), rosemary (6MT) and Ajwain seed(26MT) with a total value of USD \$1.075million (Turmeric USD\$1.037 million, Rosemary USD\$8400 and Ajwain seed USD\$30,600) through 3 exporters sourcing from 7 local turmeric, rosemary and Ajwain seed suppliers;
- Trade, market and income:
 - The market of a fish trader that obtained innovation fund and technical guidance from ENTAG has improved. A new type of product (smoked Nile tilapia) is being introduced to the market by the grantee.
 - Following the Legumes trade mission to India last year a total of close to 500 MT of pulses has been exported to India in 2019.
 - Export market linkage of 1617Mt of turmeric bulb, 1575MT finger, 6MT rosemary, and 26MT Ajwain seed with a total value of USD\$1.075million has been facilitated.
 - Turmeric quality analysis for 26 samples collected from major producing areas in Ethiopia was made in Germany (by Eurofins lab) and the market bargaining power of smallholder farmers and turmeric exporters to the international market has increased;
- Eight platform meetings have successfully been organized in 2019. The platforms brought actors from the government, private sector, stakeholders at international level, research and academia, and non-governmental actors to discuss issues and opportunities in the poultry, aquaculture, spices, and legumes sectors of Ethiopia. Major topics raised in this reporting year were poultry sector policy, challenges in the market value chain and bio-security of poultry, food safety, financing the aquaculture private sector and sustainability of the platforms after the closing of ENTAG.

Improved enabling environment

- ENTAG initiated advocacy work to incorporate spice and herbs in the new AGOA (African Growth Opportunity Act 2019-2025) unilateral trade agreement that gives a chance for Ethiopian spice and herbs products to be exported to US with no tariffs;
- Validation work on draft spice market regulation, which is aimed at waiving of tariffs on importing of spice and herbs farming technologies has been done;
- Provide technical support on how spices sector can be incorporated into the Ethiopian technical and vocational education and training system through the BEAR II (Better Education for Africa's Rise) project, which is a joint initiative of UNESCO and Republic of Korea;
- The pulse sector governance has been a major subject of discussion for the last three years. The first draft proposal for establishing Ethiopian Pulse Council has now been developed and endorsed by the ministry of agriculture; a formal launching of the Ethiopian Pulse Council is expected in the first quarter 2020 aimed at addressing value chain challenges of the sector;
- Private sector associations - Poultry, Aquaculture and Spices - have been strengthened in terms of membership base, office setting up and influence on their respective sectors. In this reporting year, the poultry sector association has increased its membership base by 20% while data is not available for the aquaculture association. Total paying membership base of the Ethiopian spices private sector association increased to 62, due to ENTAG technical and financial support. As a result, in 2019, the association generated Birr 245,000 from its members. A Dutch expert has also provided capacity building to the boards and managers of all supported associations on strategic planning and proposal development for finance acquisition. These will generally push the associations towards sustainability and able to lobby for sector transformation.
- Through a successful lobbying and using the platform meetings as a tool, permission has been officially granted by VDFACA to export poultry feed to other countries outside Ethiopia. This will support feed companies to attain self-generated Forex reserves to import essential inputs;
- The first National Poultry Forum has been successfully accomplished this year with five regional poultry sub-forums. The forums highlighted the role of the private sector in transforming the sector contribution to the country's economy and the coordination needed from a public- private partnership to realise this;
- By making use of the 10th platform meeting, the marketing directorate of MoA has started to draft a poultry market legal framework. In general, the lobby work supported by ENTAG on various issues of the private sector in poultry, aquaculture, pulses and spices has resulted in positive change in the enabling environment.

Major challenges, opportunities, lessons learnt and way forward

Challenges

- Volatile security issue persisting throughout the country hindered implementation of planned activities as per schedule, and eroded the confidence of foreign investors to communicate, collaborate and work with Ethiopian counterparts;
- Continuous change in the staffing of government offices makes lobby work tedious and outputs low;
- The implementation of few innovation fund projects and their expected impacts have been constrained due to several reasons; such as, foreign currency shortage to import machines and materials; grantees' incapability to raise their share, unrest in project sites and mismanagement of the grant by companies.

Lessons and Opportunities

- Public-Private Partnership: Over the last two years considerable effort has been made by ENTAG to support the establishment of Ethiopian Pulse Council. However, the idea was objected by EPOSPEA mainly because of their fear that it may undermine their association. Through a series of dialogue and now by bringing Ministry of Agriculture more to the limelight, the concept seems to have got full support including by EPOSPEA. The key lesson here is in the future we need to have the critical mass attention of the public sector in addition to the anchor private sector actors;
- Pulse Sector Declining: Different diseases hit the pulse sector in general and highland pulses in particular. This is resulting in a serious productivity fall. For ENTAG this provides a supporting case to bring actors together and also provides a justification for crosscutting ideas advocated on ENTAG Platform-Pulse Council, Quality and harmonization;

- Internal Harmonization and Cooperation: It seems there is less harmonization among ENTAG platforms-example poultry can merit from pulse (soybean). Also among the BENEFIT partners, there was sound effort to co-facilitate the soybean business platform and it was found very useful despite the problems of matching the demand and supply volumes. Coining forward more synergy and harmonization can be considered by organizing joint missions and platforms;
- Linking training/education and research with private sector is very important to bring about effective productivity in the aquaculture sector given the small actors in the sector and lack of many available studies;
- PSAs and government have to be able to take up the major tasks that were initiated by ENTAG to support the private sector in Ethiopia;
- The active engagement of the Ethiopian poultry producers and processors association in supporting the private sector through lobbying, stakeholder mobilizing and catalysing the successful organization of different platforms such as the national poultry forum has brought a positive outcome in generating due attention to the sector from a private sector point of view;
- Trade missions are the key interventions required for the spice and herbs sector development not only for being a means to increase market opportunities but also to create access to new technologies;
- Institutional collaboration and synergy with other stakeholders is necessary to address systematic problems such as food and quality safety issues and disease outbreaks, and has to be strengthened;
- Opportunities in organic spice, fresh and dry herbs production and export to EU and USA is tremendous and demand is growing very fast;
- Innovation Fund intervention of the program has played a great role in the introduction of new technologies that enhance productivity and quality of supported sectors of the project;
- Continued organization of sub-sector platform meetings will be vital for sustained networking of the stakeholders hence, a strategy needs to be devised before project closure.

Way forward

- Finalize Legalization of Ethiopian Pulse Council;
- Handover the ENTAG business platforms to the relevant private sector associations that are: poultry, aquaculture, spices sector associations and the envisaged Ethiopian pulse council;
- Support on the final validation of the poultry policy;
- Finalize the national slaughterhouse quality inspection training manual;
- Produce impact report of accomplishments of the last four years;
- Produce publications such as sector business opportunity reports, lesson learnt and recommendations for way forward;
- Institutionalising food safety and quality issues and disease pest issues of spice and herbs sectors and generally food products should be finalised through organising policy forums and using public media.

Quality and quantity of sustainable agricultural production (exec summary)

ENTAG conducted several interventions in 2019 to increase the quality and quantity of sustainable agricultural production in the poultry, aquaculture and spices sectors include:

- **Technical support:** 108 companies, entrepreneurs and SMEs got sector information, farm visit and operational advices in 2019;
- **Awareness creation:** ENTAG organized platform meeting to emphasize the critical situation of Bio-security hazard in the country in the poultry sector which resulted in relevant bodies taking the responsibility to devise a strategy to control and set up a safe bio-security system;
- **New Technology:** Spice cleaning, sorting, grading, polishing and pulverizing machines from India, along with solar drying technology, one modern spice packaging machine and one high duty turmeric slicing proto type machines have been introduced to sector actors and supporting research centres to improve the quality of spices and herbs brought to the market;
- **Capacity Building:** ENTAG also held training of trainers for responsible government representatives on slaughter house inspection; gave poultry sector company representatives slaughtering training, business management training for poultry start-ups and entrepreneurship trainings for hosted interns.

Improved markets and trade (exec summary)

In the reporting year, the ENTAG program worked on a range of activities on backward and forward market linkages, trade and investment integration among local and foreign agribusiness companies:

- **Market Linkage** – Following the Legumes trade mission to India in 2018, close to 500 MT of pulses has been exported to India in 2019. Demand has been much more than this number but has not been met due to lack of price and quality competitiveness. Ethiopian poultry commercial farmers have been linked to Dutch technology suppliers for farm supplies and inputs such as cages, feed mills, hatcheries, day old chicks, etc. Market linkages among several local business companies were also facilitated; these include feed producers with livestock farms, poultry producers with input importers, and legumes farmers with input suppliers;
- **Trade missions** – A poultry training and trade mission has been successfully organized to Rwanda, Kigali. The mission that aimed at emerging poultry farms in Ethiopia took eight Ethiopian delegates to Rwanda to take part in a regional event that hosted a total of 43 poultry entrepreneurs from 7 African countries. One incoming trade mission was also organized, wherein three Dutch companies have come to Ethiopia to explore business potential on food ingredients with Ethiopian counterparts;
- **Technical support and Front-desk services** - ENTAG has been supporting the private sector in Ethiopia on farm management, production quality, launching new businesses, investment opportunities, innovation fund grants, and challenges to improve their production. In this reporting year, ENTAG supported more than 108 private companies from spices, aquaculture and poultry sectors, on access to improved markets, investment opportunities and trade through its front desk, hands on advisory services and provision of graduate interns. Eight different poultry companies ranging from medium to commercial scale have been given technical support on new poultry farm establishment, poultry disease and feed management, and bio security. Besides, NGOs have also visited ENTAG front desk seeking information regarding challenges in poultry sector and the way forward in supporting the sector to identify intervention areas for development. Front desk request for spices mainly revolved around international market criteria, market linkage and sourcing options whereas for aquaculture it revolved around investment areas, potential and business start-up advice to the most part;
- The major causes of ginger diseases (Phylostica, fusarium wilt and Colletotrichum) and possible integrated disease management technologies (Matico, Mancozeb and Rape Seed Bio extract) were identified after pilot project implementation at Areka, Tepi and Addis Ababa University, where the experimentation by the former two was under field condition and later one in green house. Awareness on ginger disease management along with field evaluation of the possible management technologies was done at Areka, where more than 122 participants from media, private sectors, GOs, NGOs and smallholder farmers attended along with panel discussion on scaling up and out of the technologies. This is expected to boost domestic production, which was almost nil due to the disease incidence;
- **Platform meetings:** The program organized eight platform meetings that initiated discussion on pertinent challenges and opportunities in relation to improving quality, access to finance, private sector role in the sector and public-private coordination. These platform meetings also highlighted nutrition and food quality issues in the Ethiopian poultry, aquaculture, and spices sectors. Aside from this, the meetings were a great tool to network and to create business-to-business linkages;
- **Innovation fund** - Two ENTAG Innovation Fund grantees have completed project implementation. The first innovation fund project is packing national food varieties (semi-processed and fully processed) with a food-grade packing material & labelling has been successfully implemented in 2019. The project helps supply national foods to local supermarkets and export markets without losing the original taste. The second project is an innovative and patented product called Calcium Supplement for livestock, which improves and maximizes the efficacy of animal feed and health, and productivity of poultry and livestock. The product is produced scientifically and hygienically with minimal human contact and packed with quality packing material. Both innovations are proved approaches that can be scaled up and contribute towards increasing the quality of products supplied for human and animal consumption;
- **Business Opportunity Report** - ENTAG has been updating business opportunity reports on poultry, spices & herbs sectors. The updated business opportunity reports will provide an up to date information on the current status of the sectors in Ethiopia and serve as a tool for private investors, government and any other interested body to make informed decisions for tailored interventions;

- **Context Sensitive Investment:** Following the recent attacks on foreign investments, 11 social impact assessments reports and guideline documents were prepared as ENTAG's intervention on context sensitive investment and shared to Dutch companies and clusters to modify their CSR activities and engagements with the local community. The information of contest sensitive investment has also been disseminated to 188 foreign investments (65 Dutch and 123 other);
- **Foreign Investment:** ENTAG has taken up a new project delegated by the Netherlands Embassy to support the integrated development following 4 Foreign (2 Dutch, 1 German & 1 Belgian) investments in Kunzila, Amhara region. ENTAG in 2019 has coordinated 2 steering committee meetings in Bahir Dar with the Amhara investment commission, the companies and supporting development organizations. The program has also mapped relevant stakeholders that would be valuable in the implementation of the sustainable development plan.
- **Capacity Building:** Skills and awareness of private companies, commercial farmers and cooperatives and Unions has been improved through exposure visits of new technologies and training programs. Among these are:
 - A manual has been drafted to address Fish Products Handling and Quality Control (Simple Guide for Fishers, Fish Farmers, and Traders). It is aimed at improving existing low level of fish products quality at landing sites and markets. One training session was organized on aquaculture management for members of youth groups working on fish farming. Eight trainees and one intern received the theoretical and practical training at Ziway and Debre-Zeit areas;
 - Two capacity building trainings have been successfully held where poultry professionals from key commercial farms have been equipped with the tools and practices for managing their poultry farm to increase production. These are:
 - Poultry feed production and poultry feed formulation training in collaboration with one of the Dutch African Poultry Partner, Aeres University of applied science. The training was aimed at capacity building of 18 poultry farms /feed mill managers from the major commercial farms in the country;
 - In collaboration with Pas Reform, which is one of the leading hatchery technology supplier from the Netherlands, hatchery management training to 20 hatchery managers in Ethiopia, has also been conducted.

Improved enabling environment (exec summary)

The ENTAG program, through its platform meetings and other high-level engagements, has been serving as a catalyst for some of the national and regional policy, strategy and institutional reforms and draft of new regulations on Ethiopian poultry, spices, aquaculture and pulses subsectors. In the light of this, ENTAG has been working on the below areas in 2019:

- An incentive package for investors in aquaculture and fisheries sector is under development by the Ministry of Agriculture and Ministry of Finance. The package is expected to motivate entrepreneurs and investors to do business in the sector. ENTAG has collected inputs for this package on its platform and submitted to MoA;
- Catalysed the drafting of the poultry marketing legal framework through ENTAG poultry platform meeting;
- A go ahead has been officially granted by VDFACA to export poultry feed to other countries outside Ethiopia. This will support feed companies to attain self-generated foreign currency reserves to import essential inputs;
- The first draft proposal for establishing Ethiopian Pulse Council, a public-private partnership entity, has now been developed and endorsed by the ministry of agriculture; a formal launching of the Ethiopian Pulse Council is expected in the first quarter of 2020.

Partnership and collaboration (exec summary)

- ENTAG legume subsector has maintained close partnership with Ministry of Agriculture at higher level (minister and state ministers) where its agendas are taken seriously. Also, close relations have been maintained with SITA, 2SCALE, FTF, CFRS and other programs that work on legumes to streamline scope and enhance level of influence;
- ENTAG Poultry subsector collaborated with various Pas reform and Aeres University, Dutch company and institute respectively. It also collaborated with the Moa, poultry directorate and non-governmental organizations on policy and strategy development, form organization;

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- The Aquaculture sector in ENTAG has established and/or strengthened collaboration with various partners on research, training, platforms and trade missions. Among these are World Fish Institute in Egypt, Aquaculture Directorate, Hawassa University, Kale Hiwot Aquaculture training centre and Ziway Research Institute;
 - Institutional collaboration with other stakeholder strengthened and expanded from 6 Institutions to 16 institutions (ECTSA, ESAHGPA, TNSRC, ARC, SARC, MARC, GARC, AAU,FBPIDI, USAID, GIZ, SITA, IPD, ITA (Italy Trade Agency), Germany Food and Beverage Industry Federation and world bank RED+ +).

Clients and staff of the BENEFIT partner programs participated in various ENTAG activities, notably in the business Platforms, business drinks and innovation fund. ENTAG shared its experience in setting up and running sector platforms on a REALISE workshop in Dessie and shared its guideline document for setting up platforms to be used as input for regional pulse platform establishment. The two programs will further discuss collaboration on the topic in 2020.

In the sections below, the intermediary outcomes of ENTAG are reflected under the 3 pillars, which are:

- Agribusinesses operating in Ethiopia are solving bottlenecks in selected subsectors;
- Individual company performance is improved;
- Selected subsectors have an operating stakeholders' network;
- More companies are engaged in inclusive business models resulting in sustainable value chains (increased uptake);
- Results of Innovation Fund Programmes are utilized to solve key issues (uptake by stakeholders);
- Strategies to solve selected sector-wide issues are developed and implemented.

Quality and quantity of sustainable agricultural production

ENTAG organized platform meeting incorporating a field visit in Debre Zeit, where there is a concentration of poultry farms. The purpose of the platform was to stress to concerned government representatives on the increasing bio-security hazard being created in such clusters. These were mainly associated with lack of knowledge among authorising bodies on requirements for setting up poultry farms, lack of knowledge of controlling bodies on what can cause bio-security hazard and no set standard or controlling mechanism to ensure safety of produced products. Therefore, following the awareness creation excursion, the Poultry directorate as well as City Administration of Debre Zeit proposed to come up with a bio-security controlling strategy towards production of safe poultry produce and reduction of environmental pollution through uncontrolled waste disposal.

Sector information and implementation advices have been given to new businesses, entrepreneurs, associations, and development partners in poultry, spices and aquaculture subsectors. On-farm and off-farm technical support has been given to 108 different clients in these sectors towards improving the quality and production of their farm/firm.

New Technology

Three turmeric polishing machines, one full set of turmeric cleaning, sorting, grading, polishing and pulverizing machines from India, one rosemary solar drying technology, one modern spice packaging machine and one high duty turmeric slicing proto type machines have been introduced to improve the quality of Ethiopian spice and herbs marketed in both local and international markets.

ENTAG also financed the purchase of 5 solar driers for spices for 5 women cooperatives that are supplying their produce to a processing company. The use of such a technology would increase the quality of the produce which would have been dried on the grown otherwise. This in turn will increase earning of the smallholders as well as the processor.

Capacity Building

A training of trainers was held by experts from WUR and external consultants in cooperation with MoA. The livestock slaughterhouse inspection directorate and regional BoA, livestock offices participated on the training. One of the outputs of the training was draft national slaughterhouse inspection training manual that will be used by the MoA on the quarterly trainings of slaughterhouse inspectors and operators.

A short manual has also been developed to address "Fish Products Handling and Quality Control (Simple Guide for Fishers, Fish Farmers, and Traders)" and is aimed to improve existing low level of fish products quality at landing sites and markets. The manual after printing will be handed over the MoA, fisheries and aquaculture directorate to be used for capacity building trainings.

Research pilot

The ginger disease that has handicapped the country's spice sector and shrunk the export contribution of the sector has been a discussion point in several ENTAG platforms. In this regard, a meeting was facilitated by the project to discuss about several proposal solutions by various research centres. Based on the agreement reached, ENTAG committed to support the pilot testing of the proposed options together with research centres and organizing a field visit to validate the results. Accordingly, the identification of the disease and mechanisms of addressing it were piloted by a collaboration of AAU, Tepi research Centre and a private company. The results were satisfactory to conclude that the diseases devastating the ginger production were Phylostica, fusarium wilt and Colletotrichum and possible integrated disease management technologies recommended were Matico, Mancozeb and Rape Seed Bio extract. The field visit has been used as a tool to show other research centres of the different trials and the final results. Accordingly, the visiting research centres have agreed to further test the recommended measures before recommendation is made to MoA to be included in the extension package.

Innovation fund

Two innovation funds completed their project on packaged food and the second on packaged nutritious feeds. These innovations will be documented and communicated to a wider stakeholder as best innovations towards increased performance of private sectors in the respective businesses. Five other projects started their project in 2019. The innovations are on herbs oil distillation, poultry supplementary feed, substitute additive for poultry feed from dried green leaves, mineral supplement for poultry and turmeric cleaning, grading and pulverizing.

Mainstreaming social inclusion and nutrition

In 2019, 106 new graduates have been placed to agribusiness companies as part of ENTAG's Internship program. This is a 212% achievement from what has been planned for the year. Of the 106 interns, 70 are male while 36 are female. The total number of interns assigned to agribusiness companies is 189, which is 126% of the overall plan. A total of 65 interns (48% of the total interns who have got placements) got a job opportunity in 2019, of these new jobholders 37 got jobs at their host companies and the remaining 28 at other companies through networking. The total number of interns provided with permanent job opportunities reached 77, of which host companies employed 47 interns while the remaining 30 are employed at other agribusiness companies. Through the internship program of ENTAG, 44 companies have been supported by placing agribusiness graduate interns in their team. This intervention has helped companies increase their in-house theoretical knowledge and increase their efficiency in production as all the placed interns are of agriculture or related backgrounds.

Conclusion and Recommendations

Achievements

- Two ENTAG Innovation Fund grantees have completed project implementation. The first innovation fund project is packing national food varieties (semi-processed and fully processed) with a food-grade packing material & labelling has been successfully implemented in 2019. The project helps supply national foods to local supermarkets and export markets without losing the original taste. The second project is an innovative and patented product called Calcium Supplement for livestock, which improves and maximizes the efficacy of animal feed and health, and productivity of poultry and livestock. The product is produced scientifically and hygienically with minimal human contact and packed with quality packing material. Both innovations are proved approaches that can be scaled up and contribute towards increasing the quality of products supplied for human and animal consumption;
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- Identification of the actual major causes and the integrated management technologies for the ginger disease outbreak that devastated 85% of the total production of the country and putting the country ginger export to nil. Following this, the management approach would be validated in wider varied pilot areas by research centres to then be incorporated in the extension system. This would as a result lead to improved production quality and quantity of ginger;
- A short manual has been developed to address "Fish Products Handling and Quality Control (Simple Guide for Fishers, Fish Farmers, and Traders)" and is aimed to improve existing low level of fish products quality at landing sites and markets.

Challenges, opportunities and lessons learnt

- The fragile peace and insecurity of most of target area of ENTAG interventions;
- Slow reaction from government bodies in taking up points raised and delegated at platform meetings;
- It is vital to invite concerned government bodies to ENTAG platform meetings as it increases up-take of action points by these relevant bodies.

Improved markets and trade

In ENTAG we target the following outcomes for contributing to improved markets and trade:

- Primary outcome 1: Increased demand for and use of ENTAG's market information services, and provision of hands on support to both domestic and foreign entrepreneurs/investors in selected sub-sectors;
 - Intermediary outcome 1.1: Agribusinesses operating in Ethiopia are solving bottlenecks in selected subsectors
 - Intermediary outcome 1.2: Individual company performance is improved
- Primary outcome 2: Enhanced performance of selected sub-sectors; raise the volume and value of trade in domestic and high-value international markets;
 - Intermediary outcome 2.1: Selected subsectors have an operating stakeholders' network
 - Intermediary outcome 2.2: Results of Innovation Fund Programmes are utilized to solve key issues (uptake by stakeholders)
- Primary outcome 3: Attracted and engaged companies to pursue more inclusive and sustainable value chain development
 - Intermediary outcome 3.1: More companies are engaged in inclusive business models resulting in sustainable value chains (increased uptake)

Increased demand for and use of ENTAG's market information services, and provision of hands on support to both domestic and foreign entrepreneurs/investors in selected sub-sectors

Technical Support, Front-desk service and Trainings

In this reporting year, ENTAG supported more than 108 private companies in poultry, spices and aquaculture subsectors on sector specific technical expertise and provision of market and investment information. The technical supports were mainly related to start-up business information, investment opportunities, information on innovation funds & grants, farm management, local & export market information, sourcing of processing technologies, feed processing, and disease control. From these, eight poultry companies that range from medium to large scale production received on-farm technical support on poultry disease management, setting up of a new farm, poultry feed management, and bio-security while 5 aquaculture start-ups received on farm technical support on farm management and 11 Spice companies got support in export contract compliance, sourcing of processing machine and linking to export market.

As a result of these technical supports, the backward and forward integration of producers, suppliers, traders and processors has increased in the priority value chains of the program. Commercial farms and private companies have improved their production and post-harvest handling. The awareness of traders and suppliers has improved regarding local and international standards and requirements in supplying products. Private Ethiopian companies and commercial farms are now aware of issues hindering their international trade competitiveness from growing despite the potential of the country.

Through the front desk advisory service of the program, companies received latest information about market trends and investment opportunities in Ethiopia. The support provided improved the capacity of the target companies in their operations as well as helped them establish market linkages.

ENTAG has also been working on the latest version of business opportunity reports in its priority sectors that gives information on sector specific opportunities and areas of intervention for those who seek to launch a new business in these sectors, or who need to change their existing business. The updated business opportunity reports are going to be published in the first half of 2020.

Enhanced performance of selected sub-sectors

The enhancement of selected subsectors targeted to ensure increase in the volume and value of trade in domestic and high-value international markets. This was implemented through: (i) organization of

trade missions, Market linkage and Match making, (ii) provision of Innovation fund and Support to Sectoral Associations, and (iii) facilitation of stakeholders' platforms mainly in terms of organizing sector platform meetings and International conferences, supporting action leads and/or taking the lead to bring solutions.

Trade missions, Market linkage and Match making

In the past years, ENTAG has been working actively in organizing outgoing trade missions to different parts of the world to address challenges, such as lack of technology, knowledge, modern farming experience and quality input supplement by ensuring experience sharing and creating market linkages. Through its trade missions and exposure visits to other countries, ENTAG supported private companies, commercial farms and government agencies to have better exposure on the international market standards, latest technologies and expertise for improved market competitiveness. In this reporting year, ENTAG has also organized an incoming mission from the Netherlands and outgoing missions to India, UAE, Germany and Rwanda. The incoming trade mission was on food ingredients, where three Dutch companies joined and met over 15 Ethiopian companies and sector actors. The trade mission pledged at least 5 containers of potential export to the EU. The outgoing trade missions were trade and exposure visits to Kigali, Anuga food forum in Germany, Gulfood in UAE and International Spice conference in India. The trade and training mission in Kigali, Rwanda was organized in collaboration with Resilienca Rwanda and PUM through the support of RVO and the Embassy of the Kingdom of Netherlands in Rwanda. The mission aimed at emerging poultry farms in Ethiopia. The participants of the missions to Germany and India had the chance to create market linkages and B2B with mainly Dutch and other buyers and input providers. Additionally, delegates had also participated in side events organized within the trade fairs with the objective of exposure to modern farming experience and technologies.

In addition to this, market linkages among several local business companies were also facilitated. These include feed producers with farmers, poultry producers with input importers, and farmers Cooperatives & Unions with exporters. Following the Legumes trade mission to India last year a total of close to 500 MT of pulses has been exported to India in 2019. Forward market linkage of 3 exporters with 3 buyers which has contract volume of 1617MT of turmeric, rosemary and Ajwain seed and has USD\$1.075 million value done. Back ward linkage of the 3 exporters with 7 local suppliers. Market linkage of 18 mt of rosemary and 500mt of coriander failed due to lack of sufficient supply and escalated local price.

Innovation fund and Support to Sectoral Associations

In this reporting year, five ENTAG Innovation Fund (IF) grantees have begun project implementation and two other grantees completed project implementation. An innovation fund project, packing national food varieties with a food-grade packing material has been successfully implemented. The project helps supply national foods to local supermarkets and export markets without losing the original taste. As part of ENTAG IF program, innovative and patented products called Calcium Supplement for livestock, which improves and maximizes the efficacy of animal feed and health, and productivity of poultry and livestock, have been successfully implemented. The product is produced scientifically and hygienically with minimal human contact and packed with quality packing material. More than 35 smallholders benefited in market linkages and capacity building from these innovation fund projects and more than 6 new jobs were also created from the completed two projects. All of these projects are working on marketing in addition to production and processing. The total disbursement made in 2019 is euro 102, 052.00 to 11 new and existing innovation fund projects. Accordingly, the program through its innovation fund is supporting private agribusiness companies and commercial farmers in their local and local and international market competitiveness, which eventually adds value to Ethiopian agribusiness and commercialization.

ENTAG Private Sector associations support has resulted in an increase in the annual income of the associations and strengthened the membership bases of the associations for the sustainability of sectoral development. The membership base of the Poultry private sector associations increased in 20% while Spice association increased by 11%. ENTAG supported the four associations (poultry, spices, aquaculture and ENLBA) financially as well. The program also supported private sector associations by provision of trainings on trade negotiations and marketing as well as B2Bs and trade

mission linkages to their members. The support to these associations would strengthen the capacity of the private sector in dealing with issues within the agribusiness sector; and hence will have significant role in sustaining the interventions of ENTAG.

Sector platform meetings and International conferences

To address the multi-faceted challenges of its priority subsectors, ENTAG organizes quarterly platform meetings that bring together multi-stakeholders from the government, private sector, research institutions, NGOs and associations. The aim of the platform meeting is to bring together all stakeholders and provide a platform, in which to enable knowledge transfer, experience sharing, and new market information, technologies, policy and regulations to better equip the sector players. Furthermore, these platforms are structured in a way that allow the private sector to raise and discuss its challenges and pose questions to concerned governmental and non-governmental bodies that are present in the meeting.

The International Conference on Aquaculture organized by Hawassa University and partially financed by ENTAG was a nice opportunity to promote prospects of the aquaculture sector in Ethiopia. Over 150 participants from over 10 countries participated on the event. Fishers' cooperatives were linked with a Norwegian group to work on establishment of fish farms in the southern nations region.

In 2019, ENTAG organized 8 national sectoral platforms that were focused, among many others issues, on the challenges and opportunities of market and trade in four of the focus subsectors of the program. The platform meetings initiated discussions on challenges that the export and local market are facing as well as production of spices, aquaculture, legumes and poultry subsectors. The meetings served as channels for private sector associations and companies to discuss their trade and finance issues with the relevant governed agencies such as the MoA and other government agencies.

Major issues covered in the poultry subsector platform meetings were draft poultry policy, bio-security and market issues in the value chain. These meetings entailed exchanging of views to clarify the expected value addition in the processing of poultry products, to ensure the safety of the community through the delivery of safe and quality product. A notable platform meeting on the aquaculture subsector, in this reporting year, reviewed the incentives and finance in the value chain. The meeting brought relevant government agency, the private sector players, academia and the association to discuss how incentives and provision of seed money to potential start-ups would attract investment in sector. Legumes business platform discussed on exit strategy and institutionalization of the platform as way forward. As such, a team of six people was agreed to take the lead to develop the idea of Ethiopian Pulse Sector Governance proposal and first draft has already been produced. The sector governing body will be responsible to coordinate actors across the value chain. The Spices platform discussed the findings of several research centres and an agreement was reached to pilot the major findings in several research sites and private farm plots which then resulted in the validation of the major causes of ginger diseases being (Phylostica, fusarium wilt and Colletotrichum) and possible integrated disease management technologies (Matico, Mancozeb and Rape Seed Bio extract).

Apart from the trade missions discussed above, ENTAG was represented and brought stakeholders to the 5th African Livestock Exhibition and Congress (ALEC) in Addis Ababa. In the event, which was organized by the consortium of Ministry of Agriculture, Veterinary Drug and Animal Feed Administration and Control Authority (VDAFACA), Ethiopian Meat and Dairy Industry Development Institute (EMDIDI), and various concerned trade and professional associations, ENTAG was represented by its poultry and aquaculture subsectors and networking and B2Bs have been created with both local and international companies.

Attracted and engaged companies to pursue more inclusive and sustainable value chain development

In 2019, ENTAG has also engaged in a youth business challenge pilot project in collaboration with Agriprofocus and initiated by the Trade and Aid Office of the Netherlands Embassy. The graduates of various disciplines were asked to develop proposals on waste management for agribusiness. Two Dutch companies volunteered to provide their company cases and support the groups technically. The

winning 2 groups have established business entities and are engaged in production of vermin-compost and animal feed input.

In 2019, 106 new graduates have been placed to agribusiness companies as part of ENTAG's Internship program, of which 34% are female. This is a 212% achievement from what has been planned for the year. The total number of interns assigned to agribusiness companies is 189, of which 32% are female. A total of 65 interns (48% of the total interns who have got placements) got a job opportunity in 2019, of these new jobholders, 75% are female. The total number of young interns provided with permanent job opportunities reached 77; of which, host companies employed 47 interns and the remaining 30 are employed at other agribusiness companies employ 47 interns permanently.

ENTAG also supported 23 Dutch and 4 other foreign companies through its context sensitive investment project. The companies have been advised on how to change their CSR to result in a sustainable and conflict sensitive investments.

Mainstreaming social inclusion and nutrition

The ENTAG program focuses on developing inclusive and sustainable business models that entails the incorporation of out-growers scheme and contract farming, which supports the target value chains to strengthen. Under the Inclusive Business Model, ENTAG has been providing support to a company working with 300 smallholder women producing and processing spices & herbs. This pilot project has been picked up by another development organization as a best practice and the approach has been scaled up to 5000 smallholder women in the same area and partnering with the same company.

The aquaculture sector addresses social inclusion focusing on the youth and women. Different activities in the aquaculture value chain engage the youth and women more than other segments of the community. In this regard, inclusion of women and the youth was given due attention during planning and implementation of sub-sector activities.

It is difficult to separately discuss fish and poultry businesses and contribution to nutrition. ENTAG has also run platforms with MoA and the value chain actors to come up with strategies of increasing consumption of these two products within the daily diets of the communities.

Conclusions and recommendations

Achievements

- Trade mission organized to India last year resulted in export of 500 MT of legume crops;
- In 2019, ENTAG organized seven national sectoral platforms that were focused, among many other issues, on the challenges and opportunities of market and trade in four of the focus subsectors of the program;
- In this reporting year, five ENTAG Innovation Fund grantees have begun project implementation in 2019 and two other grantees completed project implementation;
- A total of 134 business network established among 14 Ethiopian private companies in and 2 unions and international spice and herbs buyers and technology suppliers;
- Successfully organized 5 trade missions (One incoming from the Netherlands on food ingredients and 4 outgoing to Rwanda, Dubai, India and Germany) and participated in international events that established contact with foreign business companies;
- Through ENTAG's Internship initiative, 106 agricultural graduates assigned to 44 local and foreign agribusiness companies in this budget year; out of that figure, 32% are female;
- The membership base of the Poultry and spices private sector associations increased by 20% and 11% respectively;
- Updating of business opportunity reports on poultry, Spices and Herbs were conducted.

Challenges, opportunities and lessons learnt

- Mismatch of demand and supply of agricultural outputs; where there is a shortage in main export commodities and feed inputs;
- Volatile peace and instability throughout the country has hindered some of the program's planned activities from effective implementation;

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- Slow progress of some of the associations to take up ENTAG support activities;
 - B2B and market linkages supports are major driving forces for the subsector development;
 - The platform meetings, as a pillar of ENTAG, are crucial for availing and maintaining sustainable information exchange among actors of the subsectors. It is also critical to actively engage actors in the development of the subsectors.

Way forward

- Producing impact report and wrapping up of activities done in the last four years;
- Handover the ENTAG business platforms to respective sector associations or other sector leads such as MoA;
- Publication of achievements and policy level results.

Improved enabling environment

In ENTAG, we target the following outcome for contributing to improved enabling environment in our priority sectors:

- Strategies to solve selected sector-wide issues are developed and implemented

Strategies to solve selected sector-wide issues are developed and implemented

ENTAG has supported three private sector associations in developing and fine-tuning their strategic plan by providing technical support through its coordinators as well as hired local and international consultants. These supports along with the finance provided to run some of the planned activities are expected to strengthen the associations so they take over the lobby and advocacy work for their respective sectors. As the program is phasing out, the sector associations should take over major activities that have been implemented, such as platform meetings, networking actors, and provision of sector specific information for potential companies, individuals and investors. ENTAG also supports the Ethiopia-Netherlands Business Association (ENLBA) financially to work on lobby issues.

ENTAG supported the poultry sector in contributing to the development of the draft poultry policy, which is prepared by the MoA. Currently, the draft policy is under review to be part of a compiled agricultural policy.

As part of initiatives to avail Forex for domestic poultry feed companies, ENTAG has been actively lobbying for feed producer companies to export part of their products to other countries. As a result, after a lengthy process and discussions on platform meetings with relevant government agency, feed producing companies are now allowed to export 15% of their products to other countries. The good move by Ethiopian VDFACA is expected to lessen the Forex shortage of the feed producers, and help them to import materials that would enrich the feed they produce.

By making use of the poultry platform meeting, ENTAG was able to persuade the ministry of Agriculture to draft a poultry market legal framework, which is expected to come up with rules and procedures on how the poultry market should be functioning.

Pulse sector governance has been a major subject of discussion for the last three years. The first draft proposal for establishing Ethiopian Pulse Council has now been developed and endorsed by the ministry of agriculture; a formal launching of the Ethiopian Pulse Council is expected in the first quarter 2020.

ENTAG contribution towards policy changes in the aquaculture sector is on incentives required for increased private sector participation. Through sector platform meetings ENTAG managed to add inputs for the Ministry of Agriculture and Ministry of Finance to prepare an incentives package for the fisheries and aquaculture sector.

Conclusions and recommendations

Achievements

ENTAG lobbied (variety of activities) to solve the problems facing the Ethiopian Poultry, Spices, Aquaculture and Legumes sectors. Some of the critical issues in these sectors have been brought to the attention of respective government agencies and other relevant stakeholders. As a result of this effort:

- ENTAG has supported 3 private sector associations in developing and fine-tuning their strategic plan to take over interventions beyond the program period;
- A poultry disease control strategy document has been developed and handed over to the Ministry of Agriculture;

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- Poultry feed producing companies are now allowed to export 15% of their products to other countries;
 - A poultry policy has been drafted and it is under review;
 - The first Ethiopian poultry market regulation is being drafted;
 - A new strategy document on incentives packages for Ethiopian aquaculture investors is being drafted;
 - The first draft proposal for establishing Ethiopian Pulse Council has now been developed and endorsed by the ministry of agriculture;
 - The draft spice marketing regulations development was done in 2019;
 - The project also catalysed the formation of the Ethiopian food safety and quality policy by MoH and also includes in the competency standard of 11 agro-sectors included in the national TVET systems of a joint project of UNSECO and Republic Korea BEARsII.

Challenges, opportunities and lessons learnt

- Reaching out to government stakeholders to actively play their role in addressing the challenges of the poultry sector especially on biosecurity is still a major challenge;
- Volatile security issue throughout the country hinder implementation of planned activities as per schedule, and erode the confidence of foreign investors to communicate, collaborate and work with Ethiopian counterparts;
- High interest and motivation of most relevant government offices to consider suggested policy and strategic solutions to solve sector problems is an opportunity;
- The lesson learnt on this aspect is the fact that there is a lack of well-defined and structured enabling environment for investment and private businesses operating in the ENTAG priority sectors. But the relevant bodies are increasingly becoming keen to address issues that have been raised by the private sector.

Way forward

These policy and strategies under development need further regulations and standards to address specific issues of the ENTAG priority sectors. As a way forward, ENTAG will follow up on the ratification of the draft policies and strategies, as well as their corresponding specific implementation regulations and standards.

This will be done by handing over pending activities to sector associations, and MoA which will, in turn, strengthen their respective platform meetings that will aware relevant bodies further more on specific challenges within the sectors and giving support on how detailed implementation plans can be developed.

Follow up on introduction of food quality system in the country and awareness creation on public media to get the sense of urgency is very import and has to be considered for 2020.

Collaboration

M&E and communication

In 2019, ENTAG produced various communication materials to enhance its visibility and communicate its impact to its stakeholders and partners including the EKN. The program produced four newsletters; four brochures and flyers; several articles for its website, social media and BENEFIT level newsletters; and training leaflets. ENTAG made a case study video on the experience and success of selected Innovation Fund winners. As well as, communications and PR activities were done on several ENTAG and national events related to agribusiness and these were covered on national media including the state TV and other FM Radios, in addition to ENTAG web-based and print communications outlets.

The program website, which has received more than 100,000 views in 2019, is integrated with functional ENTAG social media pages and a YouTube channel. The website of ENTAG has also served as a source for some news and updates on the BENEFIT website. In 2019, ENTAG co-organized the bi-monthly business drinks together with AgriProFocus and communicated its impacts and brand through invited winners of the innovation fund and its own team members. These business drinks also helped facilitate business linkages.

In relation to public relation activities, ENTAG has been working with the national print and broadcasting media to enhance the visibility of its brand, the BENEFIT office and the general development assistance that it is undertaking in Ethiopian agribusiness. The national broadcasting and print media covered most of the sector platform meetings. The state TV and other notable broadcasting media in the country produced news and special coverage on the activities of ENTAG in relation to challenges and constraints of poultry, spices and aquaculture sectors, and other agribusiness development efforts of ENTAG. A documentary and TV discussions were hosted by FANA TV, one of the leading TV channels in the country, on agro processing and challenge of the poultry sector in Ethiopia.

Regarding M&E, ENTAG, based on its own theory of change and BENEFIT key performance indicators, has been regularly collecting data for the bi-annual BENEFIT report and ITT. Activities of the program have also been monitored based on the performance evaluation tools-biweekly regular meeting; weekly reports; regular management meetings to check activities against the set plan and data collection for the ITTs. Innovation Fund projects have also been monitored using a baseline and end line data for launched projects. Conducting baseline and end line of innovation projects will be continuing as new round winners are already granted the fund and older projects are close to completion. The baseline is a requirement for the release of first disbursement for winning projects as it facilitates future follow-ups and monitoring of the grantees. ENTAG, as part of BENEFIT, also has taken part in the regional monitoring of the collaborative activities.

As 2020 is a closing year for the program implementation, ENTAG M&E developed a guideline to assess the outcomes of the program implementation for the last three and half year. Data collection for the assessment has already begun and analysis and synthesis of the assessment is going to be completed in mid of the year.

Collaboration for synergy

Collaboration with BENEFIT programmes

To monitor and backstop ENTAG innovation fund projects, collaboration was made with BENEFIT-ISSD and DairyBISS in 2019. Staff of the BENEFIT partner programs participated in various ENTAG activities, notably platform meetings and business drinks, and several also made use of the ENTAG Front Desk Service. ENTAG also delivered a presentation on a REALISE workshop regarding its approach and lessons learnt in setting up and facilitating sector platforms. ENTAG also collaborated with ISSD and CASCAPE on soybean market linkage towards the beginning of the year. However, due to the inclusion of soybean as mandatory commodity to be transacted through ECX the market linkage efforts have been halted. In future such market linkage efforts on soya may only be conducted through contract farming between producers and exporters or processors.

Collaboration with other projects and partners

ENTAG priority sectors platforms have maintained close partnership with MoA at higher level (minister and state ministers). Close relations have been maintained with SITA, 2SCALE, FTF, CFRS and other programs that work on legumes to streamline scope and enhance level of influence. ENTAG's Poultry subsector collaborated with various Dutch based and national, government and non-government organizations on policy and strategy development, platform organization, training delivery, market and trade. Some of the collaborative organizations are poultry directorate within of MoA, EMDIDI, NAHDIC, NVI, VDFACA, EIAR, EVA, ATA, VDFACA, EPPPA, Ceva-Sante, SNV, ZOA, ILRI- ACGG, ECI-AFRICA, USAID- Feed the Future, and USAID-Fintrac. Whereas, the Aquaculture sector in ENTAG has established and/or strengthened collaboration with various partners on research, training, platforms and trade missions. These include Hawassa University (in organizing international conference), Ziway Fisheries and Aquatic Life Research Centre (training SMEs), Integrated Aquaculture and Entrepreneurship Training Centre (business tour for platform participants), Ethiopian Aquaculture Association (strengthening PSA), Ministry of Trade and Industry (supporting PSA), Ministry of Agriculture (sub-sector platforms), Ethiopian Fisheries and Aquatic Sciences Association (sub-sector platforms), and Ethiopian Chamber of Commerce and Sectoral Associations (for B2B linkages).

Institutional collaboration with stakeholders in spices and herbs sector was also strengthened and expanded from 6 to 15 institutions (ECTSA, ESAHGPA, TNSRC, ARC, SARC, MARC, GARC, AAU,FBPIDI, USAID, GIZ, ITA (Italy Trade Agency), Germany Food and Beverage Industry Federation and world bank RED++).

Collaboration with Dutch private sector

The Dutch based private sector collaborators with ENTAG has been Agriprofocus Ethiopia, NABC, Pas Reform, Aeres University of Applied Science, Jansen poultry equipment's, Trow Nutrition, Impex, Hendrix Genetics, and PUM.

ENTAG supported AgriFood BV company in purchasing its 5FCL white pea beans from Ethiopia as follow up of the food ingredient trade mission to Ethiopia. The program is currently collaborating with four companies (two Dutch, one Belgian and one German) to implement an integrated sustainable development plan agreed upon between the Netherlands Embassy, the companies and the Amhara Regional government. The plan is expected to be implemented within the coming 3-5 years.

Mainstreaming social inclusion & nutrition

Linked with the collaboration with the other BENEFIT programmes and other development initiatives that ENTAG has been engaged, the mainstreaming of both social inclusion and nutrition was considered. For instance, the collaboration for promoting soya production and marketing in collaboration with ISSD and CASCAPE targeted the participation of women as key beneficiaries directly but also in ensuring household level nutrition.

Conclusions and recommendations

Achievements

- Effective trade missions and exposure visits were made through collaboration with sector associations, Resiliencia Rwanda and PUM through the support of RVO and the Embassy of the Kingdom of Netherlands;
- ENTAG in collaboration with AgriProFocus Ethiopia successfully organized 8 business drinks in 2019. These events brought players of the agribusiness sector in Ethiopia to share new experience and best practices and sell their products;
- The national and regional poultry forums have been accomplished through the initiation of ENTAG with the collaboration of EPPPA and the financial/technical collaboration of our institutional partners; Furthermore, policies and legal frameworks are in pipeline due to the persistent stakeholder mobilization and lobbying of ENTAG and EPPPA to collaborate for these outcomes;
- Institutional collaboration with other stakeholder strengthened and expanded from 6 Institutions to 16 institutions (ECTSA, ESAHGPA, TNSRC, ARC, SARC, MARC, GARC, AAU,FBPIDI, USAID, GIZ, SITA, IPD, ITA (Italy Trade Agency), Germany Food and Beverage Industry Federation and world bank RED+ +).

Challenges

Collaborating with government stakeholders has been challenging as they need a lot of active follow up to engage them in our initiatives.

Way forward

Some of the outcomes that have been achieved so far need further follow up by concerned bodies, such as sector associations and relevant government bodies that have to take over ENTAG's interventions after the program is closed. And hence, ENTAG will work on handing pending issues over to these actors for them to exert a continued effort towards accomplishment initiatives in a pipeline.

SBN

The logo for SBN is rendered in a bold, green, sans-serif font. The letter 'N' is partially enclosed by a green oval shape. Inside this oval, there is a white line-art illustration of a plant branch with several leaves and two small flowers.



Executive summary

Introduction

At impact level, SBN aims to contribute to competitive, sustainable and inclusive sesame sector development, including related rotation crops, for farmers' income improvement and socio-economic spill-over effects. To achieve the overall project goal, SBN seeks to enhance the combined effect of three primary programme outcomes, which are aligned to the three main pillars of the overall BENEFIT result chain. The first two primary outcomes reflect the production-push and market-pull value chain development strategy. Planning, implementation and M&E are based on strong stakeholder involvement, both at local and strategic level, which reflects the agribusiness cluster and network approach that SBN applies for sesame sector development. In 2019 a strong emphasis has been put on addressing strategic challenges for sesame sector transformation. The project goal, the three primary outcomes and the 10 intermediary outcomes, of which one is cross-cutting, are summarized in the figure below.

Goal	Competitive, sustainable and inclusive sesame sector development for farmers' income improvement and spill-over effects		
Primary outcomes	1. Production cost price reduction	2. Product and market development	3. Strengthened enabling environment for the Ethiopian sesame sector
Intermediary outcomes	Yield and quality improvement (1.1)	Post-harvest value creation (2.1)	Evidence-based information and sharing (3.1)
	Harvest, transport and storage loss reduction (1.2)	Improved market linkages and sales (2.2)	Stakeholder capacity development (3.2)
	Improved farmers' access to input credit (1.3)	Improved access to marketing credit (2.3)	Enhanced stakeholder collaboration (3.3)
	Strategic sesame sector innovation (3.4)		

Main achievements

Sustainable agricultural production. For six subsequent years, it has been evidenced that sesame yields can double and production costs can significantly reduce. Farmers can earn thousands of birr extra per hectare and the country can earn millions of dollars more. There is high interest and slow but steady progress towards the adoption of the '20 steps'. Most farmers are partial adopters; this is due to the fundamental challenges: lack of input finance, seeds and agro-inputs and options to acquire machinery. Briefs for policy makers have been prepared to address these and other challenges. Field guides are available for sesame, sorghum, soya and mung beans and cotton. With the attention for rotation crops and home gardens, SBN has demonstrated the potential for a more balanced farming system and diet, and for (production and market risk) spreading for farmers. The training of farmers in record keeping and cost-benefit analysis has reached more than 20,000 farmers in the sesame zone. It improves farmers' entrepreneurial outlook and eligibility for input finance. After MoA has adopted financial literacy training as a component of the national agricultural extension system, hundreds of DA's and thousands of farmers were additionally trained.

Improved markets and trade. The risk-sharing scheme for promoting marketing credit to cooperatives has a strong proof of concept: 100% repayment rate, increased trust and collaboration between farmers' organisations and financial institutions, better relations between farmers, cooperatives and unions and very encouraging signs of sustainability. Pre-harvest loans from cooperatives to members facilitate the financing of the last stages of the production season. On the basis of this proof of concept, the risk-sharing support scheme for cooperative marketing credit can be scaled. For years, the highly inflated ECX prices have made it practically impossible to post-harvest value creation and to develop relations among value chain operators. Because of the recent policy that prohibits buying beyond the international sesame price, this may change in the near future. With realistic domestic prices and accompanying measures for creating a level playing field, direct relations between international buyers and supplying farmers' organisations could be established. This would allow for aligning Ethiopian sesame to different promising market segments. There are good perspectives for product and market development for rotation crops. With market system change, the preparatory studies, trainings and business ideas could materialize for the purpose of product and market development, for sesame and rotation crops.

Enabling environment for the Ethiopian sesame sector. Much progress was made in 2019 in the areas of information management and stakeholder capacity development. A digital information system was adapted for the sesame sector and is ready to be shown with the data for four kebeles. Additional training materials (soya, mung bean and cotton field guides and sesame pest, disease and pest control guide) were prepared and printed. Capacity of farmers, women, youth, and experts was built on a broad range of subjects. The reach of trainings is beyond initially set targets, as a result of a larger intervention area and good collaboration with a range of partners. Efforts are made to make trainings more interactive. The application of the Kebele agro-economic planning tool extended to 50 kebeles and has increased buy-in from regional stakeholders. The preparation and sharing of several lessons learnt, experience papers and issue briefs on strategic issues is an important achievement for the SBN programme in 2019. This will be continued in the first semester of 2020. The papers and briefs have been input for strategic stakeholder meetings. Both at regional and national level there are improved

perspectives for institutionalized regional and national platforms, based on collaboration with MoA, BoA, RARI's, ATA and other stakeholders.

Partnership and collaboration. The joint activities with ISSD helped to approach the seed challenge in an innovative way through PVS and CS. Knowledge and skills of stakeholder and BENEFIT staff increased through learning from each other and trainings provided on different topics. Alignment with ATA improved (activity planning, support to FPC's, budget allocation, field visits and field days). Due to collaboration and financial support with implementing partners, the quality of their services has much increased. Banks show interest to take more risk and avail credit to farmers through unions with minimum collateral. The communication and M&E activities of SBN are diverse and done in collaboration. For several subjects piloted and developed by SBN, there are good perspectives for scaling out and scaling up. This also applies for the sister BENEFIT programmes. Based on the experiences and lessons learnt, the necessary design elements for collaboration (do's and don'ts) are quite clear.

Capitalisation of experiences. In 2019, specific efforts were made to capitalise experiences. For nine key subjects, SBN has prepared lessons learnt papers (9), which summarize challenges, opportunities, experiences and lessons learnt and suggest orientations for the way forward. These papers were the basis for more elaborate experience papers (3), which target sector stakeholders in general, as well as issue briefs (7) which specifically target decision-makers. You can find the overview [here](#). The [papers](#) and [briefs](#) were made available to various stakeholders and partners during thematic workshops and high level consultative meetings. And they were shared on websites, social media and through other communication channels. The overall [key message](#) is that with sector leadership and coordinated action, there is a huge potential for uplifting the sesame sector to the next level, to the benefit of farmers and the country at large. The opportunities are many; the main challenge is strategic decision-making and subsequent investments and actions.

Challenges, opportunities and lessons learnt

Key message to decision makers: if farmers earn more, the country earns more

If farmers are in a position to purchase inputs and apply good agricultural practices (GAP), they can double their yields. Investments in the sector could lead to higher farmer income and much higher export revenues for the country. Increasing foreign currency earnings is definitely the driver for change, which would create opportunities for inclusive local development. The calculations in the table below are based on a sesame acreage of 500,000 hectares and a production increase of 4 quintal per ha. Doubling yields requires farmers' investment of 6,000 ETB/ha. For 500,000 ha, this is an investment of 3 billion ETB, which the country will definitely earn back.



ECX price	Farmers' extra income	Additional export revenues
4000 ETB/Qt	10,000 extra per hectare Break-even at 5.5 Qt/ha	$500,000 * 4 \text{ qt} * 4,000 = 8 \text{ billion ETB}$ (267 million USD)
2500 ETB/Qt	4,000 extra per hectare Break-even at 6.5 Qt/ha	$500,000 * 4 \text{ qt} * 2,500 = 5 \text{ billion ETB}$ (167 million USD)
1500 ETB/Qt	Break even	$500,000 * 4 \text{ qt} * 1,500 = 3 \text{ billion ETB}$ (100 million USD)

In the sesame ACC's, sesame is the engine for local economic development. A thriving sesame sector would create opportunities for developing value chains for multiple rotation crops, fruits and vegetables and products of animal origin. And create conditions for female and youth entrepreneurship and employment and for improving the diet diversity score for all, with specific attention for labourers, women and children. Figure 2 shows key opportunities (dark green) and challenges (red-italic) for

sesame sector transformation and highlights the need for an integrated action plan and the commitment and collaboration of multiple stakeholders.

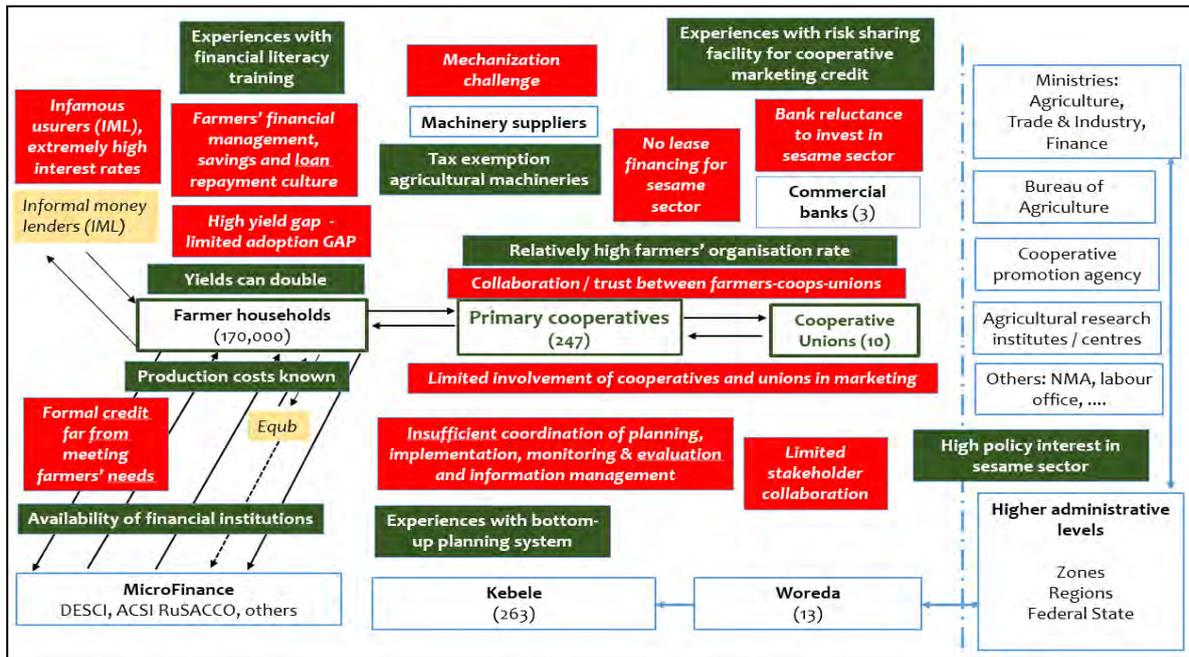


Figure 2 Overview of key challenges, opportunities and stakeholders of the sesame sector

Way forward

The following key subjects are essential building blocks for an integrated action plan for sesame sector transformation. Based on experiences in the past year(s), plans for 2020 and current discussions, with stakeholders, we suggest medium and short-term action.

Agro-economic planning by collaborating stakeholders. Starting at kebele level and consolidated at higher levels, bottom-up planning is important both for needs assessment and targeting of input finance, trainings and agro-inputs such as seeds, fertilizer and chemicals. Medium-term goal: Stakeholders at different levels make Kebele Agro-Economic Planning (KAEP) an integral part of their work, timely plan together based on local realities and financial institutions avail input credit to selected farmers. Immediate action: Target 50 kebeles and 20,000-hectares of land with full GAP adoption in 2020. With an average credit of 5,000 ETB/ha, 100 million ETB input credit is required.

Facilitating marketing credit for cooperatives. Marketing credit is an activity that kills two birds with one stone: it increases the presence of cooperatives in the sesame market and allows farmers to use advance payments for the final stages of their production activities. Medium-term goal: Several commercial banks have provided marketing credit to all unions and 50% of the cooperatives in the sesame zone, at first facilitated by a revolving risk sharing fund. Immediate action: Target 20-25 cooperatives for a similar amount as in 2018-19 (100 million ETB).

Lease financing for mechanization. Lease financing is crucial to really get to mechanization, by facilitating farmers and cooperatives to buy agricultural machineries of their choice for improved efficiency and productivity. Medium-term goal: Financial organizations (DBE, Kaza and Walya) have provided lease financing for more than 100 mechanisation cases and machinery rental services have effectively developed. Immediate action: Lease financing for 10 cooperatives (25 million ETB) provided by DBE, Kaza and/or Walya.

Farmers' financial literacy. Improving farmers financial literacy skills will help them to perceive farming as a business, take informed farm decisions and make them more prone to save and to become eligible for loans. This is a supportive activity for addressing the agri-finance challenge. Medium-term goal: MoA, BoA, CPA, unions and cooperatives have collaborated to train more than

50% of the sesame farmer households (85,000) in financial literacy. Farmers buy cost recording books themselves and financial institutions use the farm information for preparing and assessing loans. The illegal and usurious money lending has come to an end, because farmers have had access to different financial products tailored to the sesame sector (input finance, marketing credit for cooperatives and lease financing). Immediate action: Through a ToT system (experts, local trainers and coaches), train an additional 10,000 farmers, which would bring the total to 30,000 farmers trained.

Sesame sector information management system. Improving the information management system is a prerequisite for bringing the sesame sector to the next level. Digitalization is the rule of the day, which can help address multiple systemic challenges. It is also a supportive action. Medium-term goal: Fully digitalized planning, monitoring and reporting system at regional, zonal and woreda level, integrating the planning and realizations as developed and reported by kebele teams. Immediate action: Updating and use of woreda databases and demonstration of digitalized information systems at kebele level (ATA and SBN)

Stakeholder collaboration. Agricultural development requires multiple stakeholders to work together, as shown in the figure above. Medium-term goal: A sesame board is established at national level. Regional decision makers quarterly meet during institutionalized sesame ACC value chain alliance meetings. Regional stakeholder meetings are organized two times per year and multiple stakeholders collaborate at zonal, woreda and kebele level. Immediate action: Quarterly ACC value chain alliance meetings during which important decisions are taken and the details of stakeholder collaboration at different levels are worked out.

Sustainable agricultural production and food and nutrition security: promotion of integrated farming systems (rotation crops, home gardens, horticulture, crop-livestock integration), weather forecasting and related advisory services, climate change adaptation, local seed production and marketing, tailored ISFM and IPM recommendations, improvement performance of investor farmers, machinery rental services.

Value chain development and market linkages: Market system reform, supplier-buyer relations, product development for sesame and rotation crops, cleaning, storage, branding of Ethiopian sesame.

Enabling environment: Continuous updating of training and extension materials, participatory training methods for adult training, communication tools and channels, farmer-to-farmer extension, farmer-managed field and business schools, levy system for covering costs of sesame platforms and generic services (digital information system, leaflets, radio, website, social media, costs of platforms)

Social inclusion and food and nutrition security: Proactive action for training of women and youth, female and youth entrepreneurship and employment, training of children (schools), family farm perspective, labourers' conditions, recipes for locally produced commodities, aligned to food habits, etc.

Evidence from multiple SBN activities and results show that real breakthroughs and sector transformation is possible. As mentioned, the driver is that this change would yield thousands of birr per hectare per year for farmer households and millions of dollars for the country at large. This requires high-level decision-making.

Quality and quantity of sustainable agricultural production

Sustainable agricultural production – Production cost price reduction

For sustainable agricultural production, the SBN programme targets the following primary outcome: “Farmers applying innovations reduce farm-level production cost price with 25% per quintal”. The combined effect of three intermediary outcomes is expected to lead to this primary outcome: (1.1) Yield and quality improvement; (1.2) Harvest, transport and storage loss reduction and (1.3) Improved farmers’ access to input credit. Each of these intermediary outcomes have specific performance indicators which are evaluated in the second part of this chapter.

Many activities have been conducted in 2019, in cooperation with implementing partners, including smallholder and investor farmers and their cooperatives and unions, TARI/HuARC and ARARI/GARC, the regional bureaus of agriculture and their offices at different levels (zones, woredas and kebeles).

Yield and quality improvement

The implemented activities aimed at improving the performance of farmers. They focused on: creating favourable conditions for optimal production practices; promoting good agricultural practices for sesame production and promoting an integrated, sustainable and nutrition-sensitive farming system.

Creating favourable conditions for optimal production practices

Planning and practical preparation for agricultural season. Collaboration agreements signed with key stakeholders, field guides for rotation crops prepared, provided training of trainers and training of women and youth; established large plots with 5 different crops for investor farmers. Specific attention was given to the preparation and guidance of Farmer Production Clusters (FPC’s), in collaboration with BoA and ATA and to proactive action for pest and disease control during the growing season.

Weather forecasting, climate adaptation and crop modelling. The weather forecast information delivery service started in August because of resistance of NMA to accept the European Centre for Medium-Range Weather Forecasts (ECMWF) model. However, after extended discussion with NMA in collaboration with Weather Impact, Wageningen Environmental Research and Apposit the service was up and run using the NMA weather and research forecast (WRF) numerical prediction model and reached 5,500 farmers. Information receiving farmers and professionals were able to mitigate risks, and significantly reduced yield losses. To sustain the service strategic collaboration is important for institutionalizing the weather forecast service and look for options for sustainable funding, such as farmers’ contributions, a levy system and others.

Climate adaptation: Under this domain two activities were conducted. The first one was testing 10 sesame and eight soybean varieties at FTCs for the purpose of participatory variety selection (PVS) and crowd sourcing (CS) in collaboration with ISSD. Farmers were invited to make selection based on their own criteria. Based on their criteria six varieties (1st Gisham, 2nd Belesa 95, 3rd Afgat, 4th Ethio-Ugoslav; 5th Pawe 1 and 6th Pawe 2) were selected. The 2nd activity was designed to select drought tolerant and short maturing sesame varieties in Misrak Belesa wereda. Sesame varieties Setit 1, Setit 2 and Setit 3 were evaluated in 7 FTCs. Setit 2 was found adaptable to the area and gave average yield of 418 kg/ha (cf. SBN 2019 annual report). No activity was performed on crop modelling because of termination of the CommonSense project, lack of long year weather data and complete set of data under improved production system and expertise on the geo-spatial data analysis.

On-going innovation of good agricultural practices. SBN has financially supported GARC and HuARC to enhance sesame and rotation crops variety development; increase soil fertility management options, avail quality breeder and pre-basic seeds, and for pre-extension demonstration and scaling. Results are presented below.

Promoting good agricultural practices

SBN has collaborated with BoA in promoting GAP of sesame, rotation field crops, fruits and vegetables to smallholder farmers. Through the cascaded training system (see under 'Enabling environment'). ToT was delivered on GAP to zone and woreda experts and DA's (cf. capacity building 3.1.2). More than 134 investor farmers were trained and large plot (50ha) demonstrations were done with two investors.

Variety development, production and use of quality seeds. To address the variety limitations of sesame and the rotation crops and improve delivery of quality seeds the activities conducted by GARC and HuARC are listed below:

- *Sesame Regional Variety Trial:* 15 genotypes were evaluated for yield. Genotypes Aftit-159 and Aftit- 27749 were selected to be advanced to variety verification trial in 2020.
- *Sesame Pure Line Selection:* The aim was to select lines having characters of market requirement, tolerance to stress and with high yielding potential. In Tigray 24 genotypes were planted at Humera and Banat. Fifteen genotypes yielded above Setit 2 (765kg/ha) will be included in the national variety trial.
- *Screening of sesame pure lines for high potential areas of Amhara region:* 200 sesame lines were evaluated at Metema research site. 49 selected for advancing to the preliminary variety trial.
- *Sorghum landrace ('Deber') regional variety trial in Western and NW Tigray.* The objective was to characterize 'Deber' cultivar and to identify true Deber cultivar which is superior in Injera making quality and at the same time suitable for malting purpose. Fifteen selections were evaluated and Accession D2-Adebay_1 gave high yield (5,634 kg/ha) followed by D0013T-Sh-B_1(4,346 kg/ha). These materials will be planted at six environments and be evaluated by the national variety release committee.
- *Cotton Regional Variety Trial:* 18 genotypes plus 3 standard varieties were evaluated at 4 locations. Three genotypes recorded >10qt/ha yield advantage over the check. These genotypes will be advanced to variety verification trial in 2020.
- *Evaluation of sunflower genotypes in Kafta Humera woreda:* The plan was to select varieties with high seed and oil yield. 13 genotypes and released varieties (Oissa and Russian black) were evaluated at Humera and Banat. Highest yield (1,723 kg/ha) was harvested from genotype 202495. High yielding ones will be evaluated in 6 location and be evaluated by release committee for registration as a variety.
- *Seed multiplication:* Improved seeds of sesame and its rotational crops is the major limiting factor in the northwest Ethiopia, mainly because of absence of engagement of companies or enterprises in these seeds production and business; failure of local seed business (LSBs) to sustainability deliver quality seeds and lack of coordination and capacity limitations of regulatory bodies. As a result farmers recycle their saved seeds or obtain low quality seeds from friends or buy from local markets. Through SBN support, seeds of few crops were multiplied and availed for users in Tigray and Amhaara ACCs.
- *Pre-basic and breeder seed multiplication of sesame and rotational crops:* The objective was to avail quality pre-basic seeds of sesame, mung bean, cow pea and sorghum. About 600kg breeder seeds of sesame variety Setit-3 was multiplied. pre-basic seed of Setit-1 (8,600kg), Humera-1 (6,600kg); Setit-2 (12,300kg); mung bean variety Arkebe (4,200kg); sorghum variety Birhan (15,800kg); and cow pea variety Kibret (2,000kg) were multiplied by HuARC. GARC multiplied sorghum variety Melkam 4,000kg; Soya bean variety Afgat 2,800kg and Gisham 2,000kg; mung bean variety Rasa 2,500kg; sesame varieties Gonder-1 (1500kg), Humera-1 (150kg) and Abasena (1,000kg), respectively. The seeds are ready to be deployed to users or seed multiplying enterprises in 2020 production season.

Technology scaling and extension. Technologies developed locally or introduced, then tested, demonstrated and proven effective are taken out closer to users and popularized. Mung bean variety Borda was scaled in Tigray and farmers were invited to visit the fields at three stages. Borda gave 2,180kg/ha yield and was earlier than the local cultivar 'kahsay, which recorded 1,500kg/ha.

Pre-Extension Demonstration of Improved Sunflower Varieties in Lowland of West Gondar Zone: Sunflower varieties, Russian black and Oissa were demonstrated at 8 sites at Metema. About 57 (23 female) farmers and 10 woreda experts have participated in field days and selected Russian Black for its good performance.

Pre-scale up of soybean technologies in the low lands of west Gondar zone: A soybean variety Afgat was pre-scaled at Metema, Quara, Tegede and Mierab Armachiho woredas using 6,300kg seed distributed to farmers and planted on 70.5ha. Field day organized at Mierab Armachiho and Tegede and 84 famers (30 female), 100 woreda experts and 60 other participants have visited the field.

Participatory evaluation of mung bean and sorghum intercropping in Belesa Woreda. 28 farmers (2 female) and 7 experts have trained on intercropping. Mung bean (Rasa) and sorghum (Melkam) were intercropped at 1:1 ratio. For comparison sole sorghum and mung bean was planted on 15 farmers' fields. 108 farmers (42 female) and 24 experts visited the fields Farmer-Research-Extension-Group members ascertained the superiority of intercropping over the mono-cropping.

Capacity development: SBN has been supporting GARC and HuARC financially and in physical resources. Through collaboration agreements GARC and HuARC got direct financial support of nearly 2 million for research activities. In 2019 HuARC got 10 laptops (for details refer chapter 3).

Integrated soil fertility management (ISFM). Currently, acceptance of fertilizer use is much higher than it was before six years. The most important innovation of GARC and SBN is the 65kg urea recommendation in Amhara, that triggered most farmers to apply fertilizer. In collaboration with CASCAPE, soil maps for Metema and Humera have become available this year. This is input for reflecting on tailored soil fertility management recommendations.

Two liquid foliar applied fertilizers (Wuxal and Bombardier) were evaluated in three FTCs in comparison with 65kg/ha urea fertilizer and the unfertilized plots of farmer practice. Foliar spray was made before flowering using 3 l/ha fertilizers. High yield (475kg/ha) was harvested from Bombardier treated plots. There is no significant yield difference between the two liquid fertilizers. Bombardier recorded 44 kg/ha higher yield over the 65 kg/ha urea and resulted in 102 kg/ha yield difference over the farmer practice (373kg/ha). Wuxal yield (430) was similar to 65kg/ha urea (431kg). Poor agronomic practices and water logging were the challenges contributed to low yields. The inclusion of crop rotation, crop livestock integration, erosion control, water management and organic fertilizers use are anticipated to improve the soil fertility status and avoid soil depletion. Besides, physical yield advantage, economic analysis should be made to quantify the real economic gain of using liquid as well as organic fertilizers.

To select the best precursor crop for sesame in 2018 scaling activity was conducted on two commercial farmers fields. The fields were divided into four 25 x 25 meter plots. Each plot was planted with sesame, sorghum, cotton and mung bean. Then in 2019 all plots were planted with sesame. Results indicate that planting sesame after mung bean gave the highest yield (700 kg/ha), while the lowest yield (410kg/ha) was harvested from plots planted with sesame after sesame. The second good precursor crop was found to be cotton, giving 520kg/ha. Sorghum is the least option to use as a precursor crop for sesame as the yield (470kg/ha) is not significantly different from sesame after sesame planted plots (410kg/ha).

Mechanization. Mechanization is an essential input for increasing productivity of crops due to improved timeliness of farm operations; improvement of the quality of work; accomplishment of tasks that are difficult to perform without mechanical aids; and reduction of drudgery in farming activities, thereby making farm work more attractive. However, small holder sesame production is fully dependent on animal power for land preparation and planting. Weeding and harvesting is performed manually, calling for half million labour to migrate from the highlands. In sesame areas mechanization cover only 4% of small holder farming activities, while in commercial farms it is applied for land preparation alone.

To address the challenge, in the past five years, different types of machineries (tractors (big and small), ploughs (mouldboard and chisel), planters (precision and drilling), cultivators and harrows (Agro master, model KB11), fertilizer spreaders, harvesters (agro master reaper binders) and stubble cutter were demonstrated in collaboration with RARIs and effective ones were scaled to enhance uptake. Regrettably, however, adoption by farmers was often disappointing and numerous tested equipment have ended up on the scrap heap. Currently however, due to an increasing labour and

oxen shortage during the farming cycle specifically for land preparation, planting, weeding, harvesting and threshing, the need for mechanized options is significantly increasing. As a result more new and used tractors, planters, mouldboard and disk ploughs, cultivators, harvesters and rotary grass cutters have been purchased by individual farmers, farmer organizations and farm service centres. Among the tested machineries the SFOGGIA seed driller and SFOGGIA precision row planters were found effective to the current knowledge of operators and farmers. In 2019 more than 25 row planters were introduced to the area by cooperatives, unions, investor farmers, farm service centres and private companies. The tax exemption on agricultural machineries which was decided upon in 2019 is an important step. Remaining key challenges are mainly related to financing, skills and maintenance. For more information see SBN 2019 annual report and the lessons learnt paper 'Without mechanisation no transformation'.

Integrated pest management (IPM). Pest infestation is one of the major challenges for sesame and rotation crops production. In the HH survey, pests and diseases and lack of pesticides were explicitly mentioned as major constraints. Agricultural experts and DA's have difficulties to do proper pest identification and to recommend and apply appropriate control measures. To address this problem, a pocket size sesame pest identification and management manual, enriched with pictures and easily understandable texts and explanations, was prepared by SBN and printed in 10,000 copies. It is ready for distribution to farmers via BoA and cooperatives. This guide is expected to ease pest identification and management challenges. In Amhara, a practical training was organized for 91 experts and DAs drawn from six woredas in Metema and Mierab Armachiho.

Assessment of mealy bug infestation on sesame in Gondar zones sesame growing areas: In 2018, (49) and in 2019 (80) sesame fields were assessed for mealy bug infestation. In 2018 prevalence of Mealy bug was 26.5% while it was 62.5 in 2019. Metema showed the highest prevalence (37.5%) followed by Tegede (31.5%). In 2019, the highest prevalence (94.4%) was recorded in West Armachiho. Incidence varied from 0 to 20%. The two year combined incidence was 5%. Tegede and Metema scored the highest incidence (20%). This calls for the need for integrated mealy bug management options.

Support to organic farming. In most cases sesame farming in the north west Ethiopia is 'organic by default' as conventional farmers do not use fertilizer and pesticides. Nevertheless, there are quite some unions and cooperatives that are interested in organic certification, to reach European markets. In the context of high domestic (ECX) prices, it was difficult for organic companies to offer price incentives that induce farmers to transit to organic farming. Nonetheless, efforts were made to introduce organic materials like manure, natural plant extracts, liquid and solid organic fertilizers into the sesame production system in collaboration with Selete Hulling through the sesame open project (see soil fertility management). In 2019, about 272 DAs and experts and 3,859 farmers, 123 from Misrak and 149 from Mirab Belesa were trained on organic sesame and rotation crops production. Technical support was provided to farmers and coops during crop growth. Field days were organized in collaboration with WoA and cooperatives to transfer the knowledge and technology to other farmers.

Promoting an integrated, sustainable and nutrition-sensitive farming system

Promotion of rotation crops (and crop-livestock integration). In North West Ethiopia, where sesame is a dominant crop, quantitative evidences on the importance of sequential crop planting is lacking. Thus, the objective of this study was to generate evidences on how crop rotations can enhance sesame productivity; contribute to food security and nutrition diversity; help in spreading production and marketing risks; broaden the marketing horizon and thereby improve household income. To this end soya and mung beans, sorghum, sunflower, cotton, haricot bean, cowpea and sunflower were tested, demonstrated and scaled in all SBN intervention woredas at FTCs, small, medium and commercial farmers' fields. The potential of expanding rotation crops production either for food security and dietary diversity enrichment; income improvement; value addition, animal feed and for export markets was foreseen. The promotion of rotation crops is among the major successes of SBN as it improved household food access, increased dietary diversity and reduced production and marketing risks of farmers. The increased production of soya and mung beans has resulted in opening

of a trading platform at the Ethiopian Commodity Exchange (ECX) in Gonder, which eased the search for market. More attention is required for sunflower, fodder crops and crop-livestock integration.

In terms of area coverage sorghum took the lion share (388,616ha) among rotation crops. Soya bean occupied 28,460ha; while cotton 23,689ha, mung bean 5,997ha and sunflower were planted on 505ha. Sorghum varieties Deber and Dekeba in Tigray and Birhan and Melkam in Amhara are very much liked for their white seed colour, baking qualities and high yield. Variety Deber has additional quality of being suitable for brewery. Both varieties gave good seed yield (Dekeba 2,300kg/ha and Deber 2,100kg/ha). In Amhara the variety Melkam yielded a maximum of 4700 kg/ha at Metema and Kumer Aftit kebeles. Nevertheless, the variety is highly susceptible to bird attack as it mature early and has a sweet taste.

Home gardens for household nutrition improvement. The SBN survey result indicate that, the sesame zone has a remarkably low dietary diversity; 95% of the households consume <3 food groups per day, whereas the WHO advice is >6 food groups. To contribute to dietary diversity and farmer income improvement home garden activities were designed by SBN and being demonstrated since 2017 in collaboration with HuARC, GARC and WoA. Identified crops include: papaya (Maradol variety as tested and validated by CASCAPE), mango, citrus, water melon, okra, jirjir and other leafy vegetables, lettuce, onion, and pepper. In 2019, the promotion of home garden continued in Metema, Tsegede, Mierab Armachiho, Taytay Adiabo and Belesa woredas, in collaboration with HuARC, GARC and respective WoA. However, availability, accessibility and affordability of vegetable crops seeds and fruit tree seedlings, both in quantity and quality was an issue. Access to water and pest and diseases are other challenges.

Harvest, transport and storage loss reduction

Harvest loss reduction. Efforts made in the last six years to reduce harvest losses have resulted in significant impact on attitude change in terms of understanding the amount of loss incurred due to shattering. SBN recommended practices are well taken, except using plastic sheets for staking cut sesame. Survey indicate that adoption of plastic sheets is <5%). However, practices such as gathering large group of hillas to one or more drying sites; putting hillas against wind direction; threshing after 10-12 days of drying and taking plastic sheets to each drying sites instead of transporting dry sesame to one threshing point are widely practiced. For plastic sheets the question of costs and benefits is important. For establishing larger hillas, the labour time and costs are important. The 2019 planned scaling activities were not performed because of labour shortage in Tigray and pierce security situation in Amhara. In Amhara, experience sharing visits and field days were organized in Lemlem Terara kebele, Metema woreda and farmers evaluated the sesame farmer production cluster.

Storage loss reduction. PICS and Zero-fly hermetic bags were demonstrated in Belesa to cooperatives and traders to reduce mung bean losses due to weevil damage. A comparison between the conventional and hermetic bags is on-going and is being explored why the adoption of hermetic bags has been very limited, although the cost-benefit ratio seems to be high for mung bean and interesting for sorghum. Hermetic bags are not feasible for sesame because of the current piercing method of sampling.

Improved farmers' access to input credit

Farmers' financial literacy. To improve farmers' access to credit, SBN has provided financial literacy training to almost 20,000 farmers since 2016. Financial literacy has proven to be a family farm endeavour, which was specifically supported in 2019, by inviting trainees to bring another household member (mainly women and youth). This year 4,847 new farmers (835 women) were trained by 99 cooperative trainers. To increase awareness and motivate farmers to continue recording costs in consecutive years, a recognition ceremony was organized by each cooperative. More than 800 farmers who recorded their production costs and made cost benefit analysis correctly received an award of recognition and shared the benefits of attending the training and recording farm costs to fellow farmers. At the same occasion, coops sold cash recording books to old trainees for 10 birr. Discussions are on-going with coops, unions, RCPA and MoA to institutionalize the financial literacy training. The MoA has integrated financial literacy in the national extension system. This is an innovation, as DA's are mainly training on agronomic subjects. SBN supported this process by training 758 professionals

and the printing of 15,000 financial literacy manuals and 15,000 cost-recording books, which were distributed to different regions. This is an important step towards institutionalizing financial literacy through the extension system. Experiences, lessons learnt and recommendations were put together. This is input for strategic discussions and meetings that will be organized in 2020.

Financial actions at cooperative and union level. In the context of the selection of cooperatives for the highly valued risk sharing scheme for supporting the marketing credit (cf. next chapter), cooperatives were assessed, received training and intensively coached and monitored. Other activities were awareness raising and training on cooperative governance, management, marketing, and internal capitalization. Because of termination of the project that supported Ardaita and lack of experience of Ardaita staff in context of sesame marketing the collaboration with Ardaita could not be continued.

Embedded services companies. Linkages and contract arrangements between farmers and sourcing companies contribute to advance payments, seed and agro-input supply, machinery renting, supply of hermetic bags. This would improve farmers' access to input credit. However, due to high ECX price linking sesame farmers to sourcing companies was not materialized in 2019.

Collaboration with MFI's and banks and product development for input finance. The collaboration with banks through the provision of marketing credit and with MFI's through the kebele agro-economic planning continued in 2019. Both interventions improved farmers' access to input finance. Lease financing opportunities have been discussed with Development Bank of Ethiopia (DBE) and MFI affiliates Walya and Kaza to offer a machinery purchase loan product to commercial farmers, unions and coops. At the end of 2019, concrete cases for accessing lease finance were identified and will be further explored to assist cooperatives with applying for this product. High level engagement during various strategic meetings, supports SBN's efforts to create a breakthrough in the discussions with financial institutions to offer better loan and saving services to sesame farmers. In the current political context, it is most realistic to focus on federal and regional action plans for input credit, lease financing and marketing credit, developed with stakeholders and the regional financial institutions.

Mainstreaming social inclusion and nutrition

Triggered by the gender and nutrition working groups in BENEFIT and within SBN, social inclusion (gender, youth, labour) and nutrition have increasingly become an integral part of the programme. In the 13 woredas of the SBN sesame zone, there are 263 sesame producing kebeles, which are the residence of more than 170,000 farmer households. One out of six of these are female headed households (16%). The percentage of female headed households is much higher in Tigray (23%), than in Amhara (9%). In addition to the resident rural population, the influx of seasonal labourers (>300,000) is important.

For trainings on good agricultural practices separate sessions were organized for women and youth. Through the different trainings more youth and women were reached. Many women are interested in soya and mung beans, especially as crops for sale. For the financial literacy training, the household approach (training both men and women) only succeeded to a certain extent; the number of trained women was low, which needs further investigation to improve women participation in future training.

Labourers are essential for sesame production but live and work under poor conditions and have a very monotone diet. For more than 3,300 labourers, awareness creation events have been organized on labour rights and responsibilities, health and nutrition, both in Tigray and Amhara.

Conclusions and recommendations

For 'Sustainable agricultural production', SBN has performance indicators related to the three intermediary outcomes, for which activities and results were presented in the preceding section.

Achievements, challenges, opportunities, lessons learnt, way forward

In 2019 the number of farmers adopted 20 steps fully and partially (reached with increased productivity EKN indicator 1.1) were more than 54,882. The area planted in eco-friendly manner (EKN indicator 1.2) (full and partial adoption of the production package SBN indicator) was 57,186ha.

Farmland indirectly reached was estimated to be more than 50% of the total area occupied by sesame. The number of farmers accessed input finance through on-lending of the marketing credit obtained through the guarantee fund and micro-finance institutes reached 5,551 (EKN 1.3). The number of research and extension staff involved in SBN supported activities reached more than 1,844.

Achievements

42% of the respondents of the HH survey (2019) indicated to continue using quality seeds and applying fertilizer. This is probably for limited amounts and small acreages. The supply of seeds is still a challenge. The access and use to fertilizer has improved, especially in Amhara, where farmers were more reluctant. The lack and costs of agro-chemicals is an important bottleneck.

Based on the woreda data, almost one third of the farmers are adopters (26% of the farmer households have adopted some innovative agronomic practices (partial adopters) and 7% are full adopters of the 20 steps package. Communicated adoption levels: improved varieties (42%), two times ploughing (44%), row planting (25%), thinning (56%), fertilizer application (42%), three times weeding (71%), pest scouting (71%), large hilla for drying (60%), use of plastic sheets (6%) and hermetic bags (3%). The sesame acreage with clear adoption of essential agricultural practices is not above 10% of the smallholder acreage. The key bottlenecks are lack of access to finance and row planters. The large majority of investor farmers is underperforming.

In the past years, farmers who fully adopted the 20 steps on average doubled their yields (+100%), as compared to farmers with conventional practices. MRY and MRR studies of preceding years allowed to differentiate practices that optimize sesame yield and returns. Yield effect of fertilizer application, row planting, weeding and quality seeds are high. In terms of cost-effectiveness, thinning is very important (low cost, high yield increase). Fertilizer, row planting and thinning are most determining factors.

Variety, seed homogeneity and harvesting, drying, bagging and transport are most important for quality. It is very likely that full adopters produce 1st or 2nd grade sesame. Higher quality is not rewarded by higher prices in the current market system. SBN promotion is contributing to a clear, yet modest move into this direction, for mung beans more in Tigray and Belesa and soya beans in Metema and Quara. Increasing farmers interest was seen for pulses, fruit and vegetable production.

GARC and HuARC data show that growing sesame after mung bean has increased productivity of sesame by 70%; while sesame after cotton gave 27% and sesame after sorghum increased yield by 14%. Sesame planted after mung bean has yielded 290kg more than the sesame after sesame planted plots. Sesame after cotton yielded 110kg more, while growing sesame after sorghum gave only 60kg yield advantage over the conventional practice.

Mung and soya beans are increasingly produced and are now eligible for marketing through ECX. Pulses, vegetables and fruits have most potential for integration in local food habits. Agri-food industry demand for soybean is growing and offers perspectives for supplier-buyer relations. The same holds for sunflower, but for now for a very limited extent.

Research and extension accept the plastic sheets and hermetic bags as good options, but farmers don't. Hermetic bags are good for mung beans. Using larger hillas for drying and threshing is mainly a farmer innovation and is under adoption. The practice of large hillas can significantly reduce harvest losses, as field level transport losses are avoided. Collecting shattered seeds is however important.

In the past 5 years, the amount of credit provided to farmers has increased. DECSI has adopted a sesame loan for Western Tigray, which can be extended to NW Tigray. ACSI could consider to do the same. CBO and Lion bank have intensified their business relation with farmers' unions in Tigray. The same applies for Abay bank in Amhara.

Discussion: challenges, opportunities, lessons learnt and way forward

Adoption levels of GAP for sesame production is still below expectation, mainly because of lack of row planters and input finance. The strategic challenges that need policy decisions were highlighted in the

first part of this report and several papers and briefs. It is important to conduct MRY analysis (technical perspective) and marginal rate of return analysis (economic perspective) in collaboration with farmers. This is not only important for M&E, but also for developing advisory services that perceive and treat farmers as small entrepreneurs. It is important to understand the reasons why hermetic bags and plastic sheets are not popular. Investigate options for optimal organisation of harvesting and drying and threshing sites, acceptable for farmers and labourers.

Farmers who access formal credit and become independent from informal money lenders reduce credit costs with 90%, from 100% interest rate per 3 months, which is 250% on annual basis to 15-20% per year. Trustful relations of unions and cooperatives with banks can lead to more modest interest rates. For example Abay bank provided 15.3M birr loan at interest rate of 12.5% annually).

Farmer financial literacy training and record keeping has reached more than 20,000 farmers. This is 12% of all farmer households of the 13 woredas where SBN is currently operating. Compared to initial targets for a smaller intervention zone, the result is more than double than initially foreseen. This subject and the training approach and materials receives much attention from farmer households, cooperatives and unions. The quality of farmer records and analyses and of cooperative support can definitely improve. Financial literacy develops the professionalism and entrepreneurial outlook of farmers, and more reflection about farm investments and innovations. It furthermore raises awareness for savings, creditworthiness and loan repayment. The opportunity to align the cash books to criteria of banks and MFIs can be explored. Experience has learned that large scale farmer training is a project in itself. Regional and national policy discussions are needed to conceive an action plan for roll-out.

Question: Are we on track with achieving the primary outcome: "Farmers applying innovations reduce farm-level production cost price with 25% per quintal"?

The answer is yes for farmers who adopt the full package and harvest a yield >750 kg/ha. Practically there is no doubt that this objective can be achieved at large scale farms too. Adoption analysis looks at 4A's: acceptability, accessibility/availability, affordability and attractiveness. Farmers know and accept most of the 20 steps, except for the use of plastic sheets at drying sites and the recommended fertilizer dose (they use smaller amounts than recommended). Farmers are willing to adopt the recommended practices, because of economic attractiveness. Even at low sesame prices, the extra costs for production improvement will be earned back, except in years of adverse weather conditions or high pest incidence. Farmers are making efforts and most are partial adopters. Availability of row planters is a key constraint, which can be addressed by coherent action. The recommended practices would be affordable if farmers would have access to the required input credit. As always in business, investments come before benefits. The key investments needed are mechanization and agri-finance. From a macro-economic point of view, production cost price reduction is important for the competition of Ethiopian sesame in the world market.

Improved markets and trade

The following primary outcome for contributing to improved markets and trade is targeted: “Sesame farmers and SME’s involved in product and market development initiatives fetch a 10% higher price, as compared to spot market and ECX prices”. Three, related intermediary outcomes were expected to contribute to this primary outcome: Post-harvest value creation; Improved market linkages and sales and Improved access to marketing credit.

Post-harvest value creation

Business case development. In collaboration with Central Gondar Zone Industry and Investment department, three entrepreneurs (engaged in briquette making and oil extraction) and four employees from Central and West Gondar Zone Industry and Investment department, received business case development training in Amhara to strengthen their capacity to apply tools for analysing and strengthening their businesses.

Store management. Based on the inventory of stores and cleaning machines made by SBN, a training session on improved store management was prepared to address the identified shortcomings in investor, union and cooperative warehouses. There are no incentives to invest in proper store management: quality is not valued in the current Ethiopian sesame market system and speculation for higher prices is very risky because of unpredictable market price fluctuations. Warehouses are therefore only shortly used for sesame storage and empty or used for other purposes during the rest of the year (food safety risks).

Cleaning and sorting. In Tigray, Miebale cooperative (Kafta Humera woreda) purchased a locally developed cleaning machine. The transaction was facilitated by SBN. Unfortunately, market prices didn’t offer a better price for cleaned sesame, making it unprofitable to operate the machine. As the machine has different sizes of sieves it was used to clean other crops. In Amhara, Selam union finalized the installation of the idle cleaning machine at the end of 2018-19 marketing season after receiving support from SBN to collect the amount that had to be invested, mainly through internal capitalization. Financial challenges of the union required further discussions with government authorities, financial institutions and member cooperatives, with advice from SBN. The similarity of prices for all grades of sesame reduces the incentive for cleaning activities.

Oil extraction. An overview of existing local oil extraction activities was made. The inventory shows that sesame is hardly being pressed due to its low profitability. The unprecedented high price of raw sesame makes oil extraction an unattractive business. Locally produced oils are taxed, making sesame oil even more expensive. This hinders a transformation to Ethiopian production of edible oils.

Product development (sesame and rotation crops). Sesame product development is not very promising because of the high price and limited use in national food habits. The by-products of sesame are mainly used for fattening of livestock. Therefore, no specific activities were undertaken in 2019. Perspectives are much brighter for rotation crops: sorghum, mung bean, cotton and especially soya, for which production increased and additional processing activities are attracted through industrial parks.

Local consumption and nutrition improvement. The home garden pilot stimulated the production of diversified and nutritious food, such as leafy vegetables, okra, onion, tomato, papaya, mango, citrus and others. The products were mainly used for home consumption and contributed to a more diverse diet. Training on the use of sorghum, mung and soya bean were locally provided, using the recipes developed by trained local women. Options for food and nutrition development were explored and will be further investigated in 2020. A document: ‘Using local production for improving and diversifying nutrition in the sesame production zones in NW Ethiopia’ is foreseen.

Improved market linkages and sales

Cooperative spot market trade. Because of enhanced capacity, 22 cooperatives, involved in the guarantee fund facilitated marketing credit of banks to unions and cooperatives (see improved access to marketing credit), have been buying larger quantities of sesame from members and selling it at

spot markets. Historical spot market and ECX prices have been collected to support a thorough price analysis for the sector that will be carried out in 2020.

Direct marketing of unions and investors. The ECX price is structurally high as compared to the international market price. SBN does not support direct marketing, as the ECX price is above the world market price, unions and investors would incur losses of 100-200 USD per MT. After various discussions, to which SBN indirectly contributed, a new policy has been recently introduced to prevent the inflation of domestic prices. This might open up opportunities to profitably support unions and cooperatives to engage in direct marketing.

Sourcing of processing companies. The possibilities to link supplying sesame farmers and sourcing companies are bleak. This is very unfortunate as value chain development only occurs when operators are connected. This is currently not at all the case: (i) producers do not know where their sesame is going to; (ii) international buyers of Ethiopian sesame do not know where it is coming from and (iii) exporters are most interested in hard currency earnings and their import business. SBN created awareness and supported discussions on this issue contributing to the recent policy change mentioned above.

Sesame branding. SBN does not an active role in this domain, but is keeping track of developments. ATA outsourced an explorative study to a French company (SENTINEL Social and Environmental Trade-offs in African Agriculture). A first scanning report is available. Ultimately, the branding strategy requires ratification from the parliament and council of ministers. Branding is based on recognition by the market. Because of its good varieties and important production volume, Ethiopian sesame is a reference in the sesame world market. Due to low quality, the reputation of Ethiopian sesame may however be jeopardized. Branding thus also needs market reform and incentives for quality management.

Marketing rotation crops. Perspectives for value chain development for rotation crops are better. The markets for sorghum, mung and soya bean, cotton and sunflower develop and offer perspectives, especially for soya. The team is preparing a lessons learnt paper which also looks to the opportunities. The now approved marketing of mung and soya bean through ECX, the current experiences of Unions with IFDC/2SCALE for sorghum export are cases to mention. A possible new opportunity is the marketing of soya to agri-food companies in Amhara. Furthermore, the cotton market may become more interesting because of the growth of the domestic textile industry.

Improved access to marketing credit

Output marketing credit for cooperatives and unions (background). In the past four years (2016-2019), a risk sharing scheme based on a guarantee fund has been piloted in the sesame area in Northwest Ethiopia to enhance cooperative access to marketing credit and to build trustful farmer-bank relations. The marketing credit was provided during the production season, allowing cooperatives to on-lend to their members. This addressed liquidity problems farmers generally have during the final stages of the production season. When marketing starts, the finance is used for cooperative sesame marketing. The in-kind repayment condition for farmers to cooperatives stimulates members' sesame delivery to the cooperative, allowing for increased cooperative sesame transactions. Up till now, the repayment rate of Unions to banks is 100%. In some cases, Unions and cooperatives have covered for defaulting members. This shows their motivation to secure the credit facility and to continue the relation with commercial banks. Cooperatives and unions are also increasingly aware that they need savings, buildings, machines or other hardware that can serve as collateral to replace the guarantee fund. Some cooperatives are eager to take marketing credit by themselves (e.g. independent from union). This requires having equity and collateral. Asset evaluation and regular auditing are challenges. The risk sharing scheme of SBN and Agriterra, has been a successful (temporary) measure for bringing banks and farmers' organisations together.

Output marketing credit for cooperatives and unions. For 2019-20, based on the successful experiences in the preceding years, SBN demanded a high strategic commitment and risk sharing contribution (80%) from banks to continue the guarantee fund during the limited remaining time frame of the project. CBO and Lion bank could not accept this proposal due to internal policies. For the

2019-20 production season, the risk sharing scheme thus only continued with Abay Bank, based on a guarantee of 20% of the loan amount. Abay distributed a marketing loan of 15.5 million ETB among Metema union and two cooperatives from Selam union (Sanja and Godebe). Eight cooperatives of Metema union and two cooperatives from Selam union received a loan through on-lending and a total of 2020 farmers (11% women) received input finance for the last stages of the agricultural season.

Signs of continuity. With regard to the other two banks, Lion bank continued to finance Dansha union, based on collateral provided. CBO remains a dedicated partner of sesame farmers and is offering new opportunities such as loans to cooperatives that are investing in warehouses as collateral (case of Miebale cooperative). Most remarkably, both Unions, Dansha and Setit, continued providing loans to member cooperatives from alternative capital resources. SBN supports these practices through training and coaching services to unions and cooperatives.

Scaling and institutionalisation. The risk sharing modality received interest from the MoA, financial institutions and other stakeholders. A lot of efforts were put in documenting the results, benefits for the different parties and lessons learnt in papers and briefs. These were and will be input for strategic discussions, thematic meetings and a national workshop.

Mainstreaming social inclusion and nutrition

For now, opportunities for business development are bleak in general. If opportunities arise, specific attention has to be given to female and youth entrepreneurship. Most perspectives are now existing for local value addition, for which recipes for the use of rotation crops and fruits and vegetables are important. The interventions on access to finance continue to increasingly benefit women; 28% of the more than 5,000 farmers benefitting from on-lending of marketing credit were women. This is encouraging as it is in line or even beyond the proportion of female membership of the participating cooperatives.

Achievements, challenges, opportunities, lessons learnt, way forward

The main achievement under post-harvest value creation is delivering the business case development training. Overall the achievements are limited due to the current unfavourable market dynamics for value addition or quality improvements. This also decreased the interest in cleaning activities which were supported by SBN.

The availability of locally produced pulses is growing, but the actual use remains low. Home garden production is for now limited, but the pilot activities are receiving much interest for scaling.

The marketing credit financing scheme is a very successful intervention increasing farmers' access to output markets for farmers. The increasing amount of marketing credit provided by financial institutions is increasing the purchasing power and spot market presence of cooperatives. In 2018-19, marketing credit of 30,5 million ETB (one million USD) was provided by three banks to 22 cooperatives. Abay bank is really becoming a partner for agricultural development, by offering an attractive interest rate for cooperatives (12.5%). Abay participates in training sessions and attends general assembly meetings of unions. This supports the promotion of a stronger saving and repayment culture among farmers. For CBO and Lion bank, there are promising signs of sustainability. Dansha and Setit Union continued providing loans to member coops from other capital sources.

Economic circumstances are not favourable for business development in the sesame sector. The inflated domestic ECX price makes sesame an unattractive input for product development and value creation. Furthermore, sesame is not much used in Ethiopian food products.

Value chain and business development can only take off if the domestic price would be in line with international market prices, which is not the case now. Because of recent Government orientations to control the ECX price, this may change and open up opportunities. Important investments and growing market demand for soya bean, sunflower and cotton create perspectives for domestic agro-industry and contract farming modalities.

The inflated ECX price is not to the disadvantage of farmers, if indeed they get it. Therefore, the strategy that was considered most promising for farmer income improvement was promoting farmer/cooperative sales at spot markets to take advantage of inflated ECX prices. As indicated, the marketing credit for cooperatives, facilitated by a risk-sharing scheme and intensive training, coaching and monitoring, has been a success and shows promising signs of continuation. This experience is extensively described in papers and briefs and merits to be taken to the next level.

It was decided not to put efforts on quality improvement, nor on direct international market relations, because both would lead to losses for farmers. Market reform is however necessary, because otherwise value chains cannot develop and Ethiopia will increasingly lose its competitive position in the international sesame market. This will lead to lower ECX prices, which may have severe repercussions on farmers.

Enabling environment for the sesame sector

The primary outcome of this pillar, which is supportive to the first two, is formulated as follows: “The Ethiopian sesame sector enhances its performance as a result of a more enabling environment”. Four, related intermediate outcomes, are expected to contribute to the achievement of this primary outcome: Evidence-based information gathering and sharing; Stakeholder capacity development; Enhanced stakeholder collaboration; and Strategic sesame sector innovation.

Evidence-based information gathering and sharing

Databases (Excel) and digital information system pilot (eProd). Further adaptation of the eProd software and tools, training of staff and data collection continued in 2019. eProd experts regularly trained and interacted with 20 extension workers, woreda data management professionals and SBN staff members, on how to use the eProd database management system. Extension workers have registered basic field and farmer information with the eProd mobile application. Until now, information has been collected with 6,677 farmers in four kebeles, two in Amhara (3,038 farmers) and two in Tigray (3,639 farmers). Since eProd is in the primary stages of piloting, it has not yet been used for tracking and tracing cooperatives marketing activities. The experiences with database use and the piloting of eProd have been described in an experience paper and communicated to regional offices. At this point, there is a proof of concept and there is clear interest in moving towards a digital system. This requires important decisions, as investments are relatively high and funding should be sustainable.

Market information. As in previous years, international, ECX and spot market prices was collected. This information is supporting evidence-based suggestions for policy development and change and was shared with stakeholders during meetings and workshops. Attention was given to the differences between the local, national and international market prices, which show that the ECX price is inflated. Another point of attention was the price differences for quality grades, which are negligible and explain why no effort is made by farmers, traders and others to invest in quality improvement, as it is not rewarded.

Training and extension materials. Attractive field guides and extension leaflets and training modules are most important for training and extension. Field guides target farmers and are composed of short texts and clear pictures. Field guides are available for sesame (20 steps; 3 languages) and sorghum (Amharic). The following table gives an overview of the field guides developed and printed in 2019.

Training and extension materials	Printing	Remarks
Mung bean production guide (Amharic)	10,000	Distributed to professionals at different levels and to farmers
Soya bean production guide (Amharic)	15,000	in mung and soy bean production areas.
Sesame insect pest, disease and weed management guide (Amharic)	10,000	In addition to farmers, agronomists and DA's, this guide also targets re-sellers of chemicals.
Cotton production guide (Amharic)	In print	Prepared upon demand of the MoA. Covers the cotton value chain, 'from farm to shoulder'.
Financial literacy manual (Amharic and Tigrigna)	17,971	Additionally, printed for the financial literacy trainings in the sesame zone. 15,000 manuals and 15,000 cash books were provided to MoA and distributed to other regions.
Cost-recording book (Amharic and Tigrigna)	26,586	

Training modules are available for sesame production, sorghum production and financial literacy. Modules are composed of a trainer's guide, a session plan and hand-outs for trainees. SBN has been stressing the use of participatory and interactive training methods for adult training. This is a challenge in a context where top-down, one-way, lecturing type of training is most common.

Other support materials. For three subjects (developing saving culture, labour law, and labourers' living and working conditions), brochures were prepared and distributed to farmers and cooperatives, as well as a poster on financial literacy. Short educational movies produced in 2017 supported training

sessions and labour sensitisation events. The 'White Gold' radio show have been up and running for the whole year in collaboration with journalists of Amhara Mass Media Agency and Dimtsi Woyane radio (Tigray). SBN staff members work together with journalists in agenda-setting and content preparation.

Stakeholder capacity development

ARC staff training. The training of several GARC and HuARC staff members have been supported in the past years. In 2019, the support of a PhD candidate, who works on genome wide association mapping of Ethiopian sesame germplasm and genotype by environment interaction of released sesame varieties across different agro-ecology of Ethiopia.

Agronomic training. Agronomic trainings on production practices for sesame (20 steps), sorghum, soya and mung beans have been organised in a cascaded manner (ToT). In 2019, trained professionals (1,844) trained 86,524 smallholder farmers in 13 woredas. In addition, 134 investor farmers were trained in Kafta Humera and Tselemti woredas. Detailed information on training subjects and reach (differentiated for gender and youth) is available per woreda in the 2019 Benefit-SBN detailed activity report.

Training on home gardening. Building further on the 2018 experiences and results, the training was scaled to five woredas (Tsegede, Tahtay Adiabo, Metema, Belesa and Mierab Armachiho), and reached 218 farmers (45% female). The training focused on home garden set-up, production techniques of different vegetables and fruits, water management, pest and disease control, post-harvest handling and health and nutrition benefits of fruits and vegetables. The training sessions were organized in collaboration with HuARC and GARC and the respective WoA.

Training on seed production methods. Training of 74 members (5 female) of 8 seed producer groups from 5 woredas (Quara, Metema, Kafta Humera, Tahtay Adiyabo and Wolkalet). Topics covered are: seed systems, seed value chains and business, technical requirements for seed production (isolation distance, germination, purity, quality, rotation, moisture content and others), as set by the Ethiopian Standards Authority. The training sessions were organized in collaboration with ISSD.

Training on Crowd Sourcing (CS) and Participatory Variety Selection (PVS). In collaboration with GARC and ISSD Amhara, a training session was organized to prepare for CS and PVS activities (12 professionals drawn from WoA, kebele development agents and data enumerators). The training focused on the preparation, design and planting of trials, selection of participants, data collection by using observation cards and data compilation. Additionally, 143 participating farmers (80 for soya bean and 63 for sesame) were trained on how to conduct the trial. Site selection, plot arrangement, planting method, field observations and data exchange with enumerators were the major topics covered. During the training participants set evaluation criteria. For sesame these were: resistance to water logging, pest and disease tolerance, branched type, short maturing time and white colour. For soya bean: resistance to pests and diseases, drought and water logging, pod setting and uniform maturity.

Training on pest, disease and weed management. Pests, diseases and weeds are among the major challenges raised by farmers and DAs which affects the productivity of sesame and rotation crops. With the objective of increasing agricultural experts' knowledge and skills on identification of most common weeds, insects and disease that are economically important in sesame production areas, practical training sessions were organized for 91 professionals (46% female). This group included agricultural experts, DA's and private input suppliers from Belesa, Quara, Tegede, Mirab Armachiho, Tach Armachiho and Metema, as well as researchers from GARC.

Weather forecasting training. Because of unclarity about continuation of the service (see under sustainable agricultural production, this training was not done in 2019.

Field days and farmers exchange visits. Over the years, the field days have become a linking point and learning environment for farmers, professionals, researchers and policy makers. More than technical demonstrations, discussions about fundamental challenges are important. In 2019, WoA

organized the field days at kebele and woreda level. The organization of zonal and regional field days was in the hands of research centres (GARC and HuARC), zonal and regional BoA. In Amhara the regional field days were co-organized with ATA. At local level, field days were organized at different growth stages of sesame and rotation crops (planting, flowering, harvesting). A total of 75,871 farmers (21% female) and 1,768 agricultural experts (24% female) participated in field days organized at different levels. This year, it was remarkable that stakeholders showed frustration that important challenges, which hold back the sector and are known for years (finance, mechanisation, inputs), are not addressed by the government. During zonal and regional field days, which were attended by high officials, stakeholders mentioned these challenges again. This led to the organisations of high-level consultative meeting in both regions (December 2019).

Financial literacy training. In 2019, two routes were used to reach more farmers: scaling in the sesame zone and scaling through MoA. The first route concerned the scaling in the sesame zone in collaboration with 13 WCPOs, 10 unions and 72 cooperatives. A total of 122 from WCPO, cooperatives and unions were trained as resource persons. In addition to farm cost-recording and cost benefit analysis, they were also trained on participatory training methods and adult learning principles. Of the 122 trained, 99 are actual trainers, of which 40 are female. They in turn trained 4,847 farmers (835 female). The other 23 trainees supported the facilitation of training sessions and in some places, they replaced when the trainers are absent. For the second route, through the MoA and BoA, 1,132 DAs and agricultural experts were trained. In Amhara, the DA's trained 20,619 farmers from 93 kebeles. In Tigray, training was not provided through BoA. The trained DA's however supported facilitation of training sessions organised by SBN and WCPOs. The number of women trained (17%) was below expectation. Attempts were made to use a couple or family farm approach (training both husband and wife or some household members), but this did not go as expected; it requires better preparation and more commitment. To encourage farmers and promote the culture of cost recording, 792 farmers, who performed well in recording their farm costs and calculating their costs and benefits, received a certificate of recognition.

Cooperative capacity development. Efforts for cooperative capacity development have been concentrated on the training of cooperatives for the management of guarantee fund supported marketing loans. Considering their current and possible roles, as well as the challenges they face, the SBN team is of the opinion that cooperative capacity development should get more attention. Supporting the auditing and assessment of cooperatives would be important preparatory actions for that purpose.

Loan management training/Guarantee fund. In 2019, 100 (21 female) cooperative and union accountants, managers and loan professionals were trained on all aspects of loan management, from loan application, member screening, loan disbursement and administration to final repayment. The importance of saving and internal capital mobilization was also discussed. Trainees not only learn from the trainers, but also from the experiences from fellow participants, for instance about member administration, selection and eligibility criteria, marketing, loan use and its administration and repayment. The training sessions served as a platform for unions and cooperatives to meet, discuss and learn from bankers.

Business planning training. Training on business analysis was delivered for 6 persons, in collaboration with Central Gondar Zone Industry and Investment Department.

Labour conditions. Labour sensitisation events on labourers' and employers' rights and duties, and labourers living and working conditions were organized in collaboration with local committees, Woreda offices for Labour and Social Affairs, Health, Security and Administration. During these events, the leaflet about rules and regulations (Pro. 377/2003) was used, as well as short films shown on mobile cinema.

Enhanced stakeholder interaction and collaboration

SBN uses two approaches for promoting stakeholder interaction and collaboration: (1) direct collaboration with specific organisations (ARARI/GARC, TARI/HuARC, BoA, RCPA/WCPO, unions,

cooperatives, banks and MFI's) and (2) organisation of multi-stakeholder meetings and field days at different levels for information sharing and discussing the challenges to be addressed.

Kebele and woreda PME and local stakeholder collaboration ('kebele planning'). Kebele Agro-Economic Planning (KAEP) aims to address the smallholder sesame farmers' challenges to access seeds, agro-inputs, training and input finance. The KAEP tool (guide and format), developed and tested in 2017 and 2018, was further updated in the first semester of 2019. After getting the buy-in from stakeholders at different levels, the activity was extended to 50 kebeles. About 320 committee members were trained and subsequently prepared the kebele plans. The tool helped to: (i) define and visualize the realities of the kebeles; (ii) identify agro-input and agricultural credit needs and (iii) define the credit amounts per hectare (for sesame and possibly rotation crops). This year, 1,459 farmers were able to access credit from ACSI/DECSI out of the 2,833 farmers selected. There are still many challenges: staff capacity at kebele level, availability of basic information, ownership and commitment and insufficient trust that planning will be followed by implementation. The experience was documented in an experience paper and shared via different channels. An issue brief was shared with regional authorities during the consultative meetings at Wukro and Bahir Dar.

Regional platform, coordination and decision-making. Regional meetings and field days bring stakeholders together in Amhara and Tigray. This year, two regional field days were organized in both regions. The meetings were explicitly organised for regional authorities only, mainly bureau heads and directors, their deputies and consultants of the regional government. The meeting in Tigray (Wukro) was chaired by the TARI Director and attended by 29 individuals. The meeting in Amhara (Bahir Dar) was chaired by the head of the Industry and Investment Bureau and attended by 46 individuals. Supported by issue briefs, participants discussed the following main challenges: access to seeds and agro-inputs, mechanization, performance of investor farmers, input finance, marketing credit and KAEP. These topics are quite related as was shown in the first part of this report. This led to the organization of high-level thematic meetings, organised by ARARI and TARI in collaboration with BoA, ATA and other stakeholders. It is now important to build further on the first orientations for action that were given during the meetings.

National sesame platform. Early 2018, the MoA was about to move towards the establishment of a national sesame sector coordination body. A proposal was made to the then Prime Minister. No progress was made because of Government and position changes. Liaising with MoA and ATA for launching a national sesame platform (or council or board) continued in 2019, but has not yet led to results. As of recent, launching of a sesame platform has been taken up as part of the national export plan. An organising committee with members from MoA, MoTI, ATA, EPOSPEA, SBN, ECX and EIAR has been established. A tentative time plan was set to complete all necessary preparations before the end of January 2020. A meeting is planned for higher officials from Ministries and regional bureaus to have a common understanding on the issues to be addressed by the platform.

Alignment for regional and national coordination. The SBN intervention zone concerns the Tigray and Amhara Agricultural Commercialisation Clusters (ACC's). At regional level, ACC VC alliance meetings are regularly organised by regional decision makers. These meetings are chaired by the regional presidents or BoA and ATA assumes the role of secretariat. SBN collaborates with regional stakeholders and ATA to establish quarterly meetings that are well prepared (agenda supported by issue briefs). The ACC-VC meetings are aligned to the regional transformation councils, which are aligned to the national transformation council, which is chaired by the MoA (formerly the Prime Minister). Important issues can be transferred to these bodies (a practical example was the issue of tax exemption for agricultural machinery). For the national coordination of sesame ACC's, SBN proposes a national sesame board, at the image of the national coffee board.

Strategic sesame sector innovation

For 2019, 12 strategically important topics for sesame sector transformation were identified for discussion with key stakeholders. The subjects were prepared and discussed during workshops, field days and high-level consultative meetings in Tigray and Amhara. Papers and briefs were prepared for all subjects.

Subjects mentioned in work plan 2019	Observations
Mechanization, clustered farming and options for purchasing and renting machinery in the sesame zone of NW Ethiopia	Issue brief, lobby for tax exemption, discussed at several occasions.
It takes two to finance: perceptions, needs and what it takes for farmers and financial institutions to trustfully work together	Discussed during a separate meetings with financial institutions, unions and cooperatives; high level meetings, several papers and briefs prepared.
Farmers financial literacy: why it is important for rural households and how to promote and scale it	
Kebele agro-economic planning: results and follow-up action	Discussed with regional stakeholders in first quarter, for KAEP training and planning in 2019.
Variety development, seed multiplication and local marketing and distribution of quality seeds in the sesame lowlands of NW Ethiopia	Collaboration with ISSD, draft on seed sector development, issue brief on seeds and agro-inputs, discussed during high level meetings.
Marketing credit for cooperatives with risk sharing guarantee fund modality	Separate meetings with several financial institutions, high level meetings, several papers and briefs prepared.
Labour law, employers' and labourers' rights and duties: how to implement in the sesame zone?	Two brochures, draft notes, awareness raising events in both regions.
Are stores up to standard – best storage and conservation practices	Training material prepared, but not used.
Marketing for prosperity: options for adaptation and innovation	Informally discussed at several occasions, topic for next ACC VC meetings.
Towards a sesame sector information system – first experiences in three woredas	Lessons learnt paper prepared, sharing of e-prod system with stakeholders in March 2020.
Weather forecasting for tailored advise during the agricultural season and climate change adaptation	Lessons learnt paper prepared, focus was on ensuring weather forecast services with NMA.
Cooperative assessment: priorities for capacity and farmers' business development	PowerPoint for Ethiopian delegation visit to the Netherlands, chaired by Minister of Agriculture and organised by Agriterro. Unfortunately, the visit to WUR was cancelled.
KAEP planning 2020: coordinated action of local government, farmers and financial institutions	Experience papers and issue brief prepared, discussed during high level regional meetings.

Mainstreaming social inclusion and nutrition

A considerable number of women and youth took part in trainings facilitated by the programme. Separate training sessions were organised for women and youth. Attempts have been made to develop stakeholders awareness on the importance of gender mainstreaming. Despite the intended family farm perspective, the number of women reached with financial literacy training was lower than planned. In the trainings organized on home gardening and seed production, farmers were also trained on the importance of nutrition, food groups, causes and consequences of poor nutrition. Farmers using home garden products as nutritious food shared their experiences and their cases were documented and shared.

Despite their importance for sesame production and their share in production costs, labourers are often overlooked. In 2019, over 3,300 farmers participated in labour sensitisation events (Gendewuha, May-kadra and Dansha). In the events, information is given on labourers' and investors rights and responsibilities, labour and living conditions, health and security. Labourers were also informed about improved production practices. Brochures on the labour proclamation and on labourers' living and working conditions were distributed. Short movies on the same subjects were shown using mobile cinema.

Achievements

Considering the work on databases and the digital information system pilot, action research, regular planning and evaluation meetings, surveys and evaluations, it is likely that that information quality and use has to some extent improved. The use of databases and information can however be improved much. The range of communication channels, field guides and training modules, suggest that SBN has contributed a lot towards information sharing to and among stakeholders. It must be acknowledged that SBN has been instrumental in developing and maintaining the materials and communication channels.

In 2019, soya and mung bean guides, pests, diseases and weeds management guide, financial literacy manual and recording books were published and distributed. These are good examples of translating research results in easy to understand guides for farmers. These and other training and extension materials have been inspiration for several organisations.

The system of training delivery to the targeted audiences has been improved and has reached more people than originally planned. This is mainly due to trustful collaboration with different stakeholders. All DA's of all sesame producing kebeles have been involved in the scaling of GAPs. They provided theoretical and practical trainings and coached farmers. The number of woredas (13) and kebeles (263) is much more than was foreseen (9 woredas, 100 kebeles), which also enhanced the number of DA's who were trained and involved in the programme. The integration of financial literacy training in the national extension package extended the scope of DA involvement. DA's have provided advice on rotation crops as this was part and parcel of the BoA extension programme.

Collaboration with more than 72 cooperatives and 10 unions during the roll-out of the financial literacy training, and intensive collaboration with 22 cooperatives involved in the marketing credit support scheme, for which cooperatives were assessed with a tailored tool and intensively trained and monitored, improved these cooperatives performance. In 50 kebeles, stakeholder collaboration was much improved as a result of the KAEP, which has been piloted since 2017. The organisation of meetings, workshops, field days helped to evaluate marketing and production activities; discuss key strategic issues and plan future activities. Stakeholders now know of each other's activities. This effort is well recognized but it cannot be concluded that stakeholders align their efforts and plans. In December 2019, strategic meetings of high regional officials have been organised, based on collaboration between RARI's, BoA, ATA and SBN.

SBN is an evidence-based opinion developer in the sesame zone, for a broad range of subjects (GAP, rotation crops, ISFM, IPM, mechanisation, lease financing and machinery rental services; weather forecasting, input finance, marketing credit, training modules and methods, extension materials, communication and social media, ...). Experiences are shared and proposals are made for policy changes and reforms. Some strategic challenges that were raised have been addressed: controlling the inflated ECX sesame price, change of grading, tax exemption for agricultural machineries, MFI credit amount per hectare and ceiling per farmer, involvement of banks in the sesame sector. SBN has collaborated with the labour office to raise awareness of investor farmers and labourers on prevailing regulations. During mass meetings, thousands of labourers have been reached.

Challenges, opportunities, lessons learnt and way forward

Effective use of information management systems and maintaining the different communication channels are the major challenges. Improving this requires the design of a professional PM&E system and clear formats to be used at different levels. Investments in computer hardware and staff training are also required. This can be solved, by mobilising resources based on a levy system.

Changing the traditional top-down training approach to participatory methods and providing demand driven training is still the challenge. Most agronomic trainings are organized according to the traditional top-down approach focusing on training large numbers rather than quality and investing in farmer-trainers; planning insufficiently based on needs assessments and not doing sufficient followed up. Yet, cascaded ToT system of SBN, the production guides, training modules, attractive extension materials, radio programmes and films have had an impact on the perception of training delivery. The same holds for the collaboration with farmers for scaling trainings. The major lesson learnt is that a training approach has to be well prepared in collaboration with stakeholders. Learning from the educational departments of nearby universities and using modern ICT tools are opportunities. Key elements for the way forward: focus on farmer-to-farmer training, adaptation of DA incentive systems, local farmer field and farmer business schools, focusing on outcomes rather than outputs, supporting training sessions with modern ICT.

Based on the achievements with promoting stakeholder collaboration at different levels, it can be said that things have changed. A key lesson is that though stakeholders collaboration at different levels helps to identify and address the strategic challenges of the sector, necessary decisions for sector

transformation are not yet taken and the performance of the sector is much lower than could be the case. Overarching leadership is missing. Doubling the turnover of the sesame sector and developing sesame VCs based on the collaboration of operators are the key challenges and opportunities. Key elements for the way forward are: capitalising the evidence and lessons learnt and sharing constructive proposals for change; lobbying regional level stakeholders to make bottom-up and collaborative planning the building block and an integral part of regional planning; collaboration with ATA for the institutionalization of regional platforms and lobbying MoA to take the lead in establishing a national sesame platform or board.

Building upon study and survey findings, practical experiences and lessons learnt, SBN is in a position to share recommendations for addressing the essential challenges and to sketch a pathway for change in the coming 5 years. This would be input for policy makers and directions of key institutions, as well as for support programmes (AGP, ATA). The way forward is to continue supporting high level policy meetings, in collaboration with ATA, MoA, BoA, ARI's, FCA/RCPA, unions and cooperatives, banks and MFI's. A retreat of high level decision makers for developing a coherent action plan with interdependent measures would probably be the best option to achieve this.

There is a huge potential for bringing the Ethiopian sesame sector to the next level. Failure to do so is costing farmers thousands of birr, and the country millions of dollars per year. Especially an integrated agri-finance approach, combining financial literacy training, bottom up planning, input finance, lease financing and marketing credit for cooperatives, is required. Positive trends, which deserve support are the following: Growing buy-in for coordinated bottom-up planning (KAEP); Interest and demand for digitalized information system (BoA, Unions and cooperatives); Strong stakeholder demand for leadership in the sector to address persisting challenges. Regional sesame ACC-value chain alliance identified as multi-stakeholder platform for strategic decision making, with linkage to regional and national Transformation Council.

Collaboration

M&E and communication

Stakeholder-oriented PME system. SBN has been putting much effort to develop a stakeholder-owned bottom-up planning and joint monitoring and evaluation system: woreda databases, digital information system (eProd) and the Kebele agro-economic planning are highlights. Instead of a project PME system, the aim is to develop working methods with the stakeholders that have a prospect of institutionalisation.

Studies and surveys. To support M&E, SBN has conducted many studies and surveys. To date, the following can be mentioned: MRY/MRR studies to assess the marginal rate of yield (MRY) and marginal rate of return (MRR) of agricultural practices, a household survey among 918 sesame growing farmer households and nutrition and gender baseline surveys. The results of these studies and surveys will be consolidated in 2020.

Communication. SBN shares information to stakeholders, partners and the general public primarily using the websites including www.sbnethiopia.org, the quarterly SBN newsletter, social media (Facebook, Twitter, LinkedIn), production guides, tools, cost recording books, training modules, brochures, posters, one pagers, experiences papers, issue briefs, meetings, radio programs, films, field days, workshops and experience sharing visits. These extension and communication tools have been continuously produced, updated and shared, to support stakeholders' activities and decision making, to the satisfaction of partners. Nevertheless, sustaining these efforts after project termination is a major concern of SBN. Discussions are underway how national and/or regional stakeholder platforms would take the decision on the continuation. SBN's conviction is that a levy system (small amount per quintal exported) might be a modality to sustain the extension and communication materials production and sharing.

Collaboration

Collaboration within the BENEFIT partnership. SBN is collaborating with ISSD and CASCAPE in Amhara and Tigray regions to improve soil fertility thereby increasing productivity of sesame and sorghum; increase varietal base for farmers through participatory variety selection (PVS) and crowd sourcing (CS); build knowledge base on gender, women and youth in the sesame areas. The alliance with ENTAG was to facilitate marketing of the rotational crops. The joint planning, implementation, monitoring and evaluation of activities allowed for the tapping of knowledge and experience of the different programmes and the efficient use of resources.

The joint activities with ISSD are much appreciated. The collaboration helped to approach the seed challenge in an innovative way (e.g. through PVS and CS). Unfortunately, the security problem in Metema has hindered reach and output. The following are some of the activities conducted in 2019:

- Training of trainers training (ToT) on sesame and mung bean production packages; value chain development, quality seed production, seed system and seed business; financial literacy, and awareness creation on environmental degradation in collaboration with ISSD and CASCAPE for 25 experts and development agents (7 female) drawn from five woredas in Tigray.
- Also in Tigray, another set of training was delivered to 42 (1 female) participants on quality sesame seed production, seed value chain guideline; seed system and seed business and financial literacy. The trainees were private seed producers and seed producing cooperatives; seed experts from woreda offices of agriculture, and an input expert from regional bureau of agriculture.
- In Amhara, training was provided to 12 participants including experts from WoA; focal persons; DAs and data enumerators on PVS and CS.
- Training on quality seed production and marketing was provided to 32 farmers and DAs from Workamba and Quara seed producer cooperatives and DAs supposed to coach the SPCs. The crops covered in the training were sesame, soybean, sorghum, and haricot bean.
- Sixteen TARI researchers were trained on R-statistical software in collaboration with ISSD, CASCAPE and Mekelle university.
- In Tigray, the Setit-2 sesame variety was scaled on 10ha of land owned by a seed producing cooperative (Wuhdet based in Rawyan kebele), in collaboration with ISSD, using row planter and the

full sesame production package (20 steps). The severe gall midge infestation, causing low productivity (490kg/ha), indicates the need for improved pest management.

- In Amhara SBN and ISSD supported farmers in improving access to seeds through PVS and CS activities conducted in 2019. For this purpose, 9 improved sesame and 8 soya bean varieties were collected and distributed to PVS and CS hosting farmers. A total of 300 farmers (150 for sesame and 150 for soya bean) were selected. Sesame varieties were used for PVS while soya bean was for CS.
- Field days were organised at Kokit and Kumer Aftit kebeles to create awareness and popularize varieties assessed in the PVS and CS. More than 200 farmers visited the sesame, soya bean and sorghum PVS and CS plots, jointly set criteria, evaluated and selected adaptable varieties for each location and learned from each other.
- Linking seed producer cooperatives with basic seed suppliers and buyers: pre-basic seed was supplied to the SPCs through GARC and HuARC. Efforts were made to link the SPCs with buyers, but as the seed was not inspected by the relevant authority in the field, it was not easy to get buyers. The major lesson taken here is that SPCs should be supported to fulfil the necessary procedural requirements early.
- The planned training on financial literacy to member farmers of the Workamba and Quara SPCs was not done because of the security situation in these areas.
- Providing training for executive committee members of the SPCs on financial management, accounting and cooperative marketing was covered during the quality seed production and marketing training sessions.
- Awareness creation training on nutrition and gender was organized for 32 farmers and development agents from Workamba and Quara SPCs in collaboration with ISSD.
- SBN staff participated in the first regional gender and nutrition working group meeting and shared their experience to CASCAPE, ISSD and REALISE colleagues.
- BENEFIT partner programs organised regular meetings (every two months) and jointly monitored and evaluated the planned activities.
- Progress reports were regularly produced and shared with stakeholders; news articles were written and posted on SBN website, social media, newsletters.
- A SBN agronomist participated in a training on Innovation Recommendation Mapping (IRM) organised by CASCAPE and partners and shared what he learned with the team.

Collaboration with other projects and partners. Every year SBN signs collaboration agreements with public and private institutions, as well as with flagship programmes and projects that operate in the SBN intervention regions. In 2019, collaborations were realized with Amhara and Tigray bureaus of agricultural (BoA), ARARI and TARI, ATA (national and regional), RCPAs, NMA through weather impact, cooperative unions, banks (CBO, Abay and Lion) and micro-finance institutes (ACSI-DCSI). In 2019, the main collaborative activities were the following:

- ToT trainings in GAP and financial literacy, technology demonstration and scaling activities were done with bureaus of agriculture, RARIs and ATA;
- Sesame farmer production clusters (FPC) were organized, trained and coached in collaboration with zone and WoA, SBN and ATA;
- RARIs and SBN together generated technologies and multiplied seeds of sesame and rotation crops and disseminated these to end users via BoA;
- The financial literacy training and coaching was implemented under the leadership of unions, cooperatives and WCPA;
- The guarantee fund designed to address challenges in input and output marketing credit of cooperatives is being executed in collaboration with Agriterro and banks (CBO, Abay and Lion), unions and cooperatives;
- Weather forecasting information was delivered to farmers through SMS messages in collaboration with NMA, Weather Impact, Apposit, and Wageningen Environmental Research;
- Teaming up with ATA in stakeholders' mobilisation, workshops, ToT training, field visits and organizing field days;
- Collaboration with F&S Ethiopia for cooperative assessment, loan management training and roll-out of Ardaita training modules.

The project collaborates with other public and private sector stakeholders at different levels whenever teaming up is necessary.

Collaboration with [Dutch] private sector companies or partners

- Weather Impact and Wageningen Environmental Research for developing, sharing and assessing farmers' use of accurate weather forecasts;
- Communication and collaboration with Dutch funded organisations and projects: Agritererra and F&S (Guarantee fund) and IFDC/2Scale (rotation crops and support to unions).

Thematic collaboration. Important subjects of thematic collaboration, focussing on scaling and institutionalization are the following:

- Institutionalising financial literacy training to the national extension package;
- Lobby MoA for institutionalizing the guarantee fund at federal level;
- Launching the national sesame platform with sustainable funding from the sesame sector for effective coordination, innovation, information and knowledge sharing;
- Support for development planning (kebele agro-economic planning);
- Farmers' access to weather forecast and related advisory services, and the need for validation and scaling and the strengthened collaboration with ATA and NMA.

Mainstreaming social inclusion and nutrition

Social inclusion in collaboration activities. SBN is improving the participation of men, women, children and youth. Efforts were made to bring women and youth participation to a significantly higher level in trainings, technology scaling and during field days. For example, in the PVS and CS implementation activities aimed at increasing the variety portfolio of sesame, soya bean and sorghum, 50% of the participants were women. A higher level of women participation was observed in home garden and financial literacy trainings. During field days, women actively participated and evaluated varieties and employed selection criteria which were often overlooked by male farmers. In other cases the participation level is below 30%.

Gender and nutrition activities. Training on gender mainstreaming, sensitivity and inclusion was provided to SBN agronomists and researchers from GARC, who in turn trained woreda experts. Gender awareness training was provided to 32 SPC member farmers (4 women) and development agents from Quara and Metema woredas. Eighty one women farmers (41%) participated in the evaluation of varieties in PVS and CS trials. The awareness of SPCs on nutrition sensitive agriculture and gender mainstreaming has been increased through the trainings provided.

Transferring responsibilities and ownership

In all activities SBN participates with one or more stakeholders. This helped to build ownership and results in partners taking responsibility. For example, the roll-out of 20 steps has always been done with BoA and ARC's; the financial literacy programme is being scaled with farmers' cooperative unions and CPO; weather forecast is disseminated in collaboration with NMA; labour related activities are accomplished with labour and social affairs office; home garden promotion with WoA and health offices and the guarantee fund supported promotion of marketing credit for cooperatives is implemented with banks and unions. Increasingly, these partners take the responsibility of planning, training, implementation and monitoring, in the absence of SBN.

These partners are there to stay, and SBN is bound to go. In principle, all activities are transferable as partners have been trained and materials are available. In the SBN team, responsibilities are clearly given to staff members, with a distinction of lead and support roles. WUR staff are supportive to the Ethiopian staff in training, planning and coordination, M&E, reporting, capitalization and communication. In the spirit of BENEFIT, it is an Ethiopian-Netherlands effort.

Achievements

Collaboration with ISSD has much improved and the joint activities are much appreciated. The collaboration helped to approach the seed challenge in an innovative way (e.g. through PVS and CS). Unfortunately, the security problem in Metema has hindered reach and output.

Alignment with ATA has significantly improved in terms of planning and implementing the FPCs, providing training, organizing joint monitoring, evaluation events and field days.

Due to collaboration and financial support, the portfolio of improved technologies and services of implementing partners has much increased (crop varieties, machineries, production packages, guidelines, information, etc.). However, the validated and scaled technologies need to reach farmers and their organizations for transforming the sub-sector and improving farmer income.

The knowledge base of stakeholders, BENEFIT and RARI staff increased through trainings provided on different topics (concepts of CS, design of trials for CS and PVS, gender and ClimMob software application, R-statics software, GAP, quality seed production and marketing, financial literacy, loan management, climate adaptation, nutrition). Staff of the programmes learned from each other.

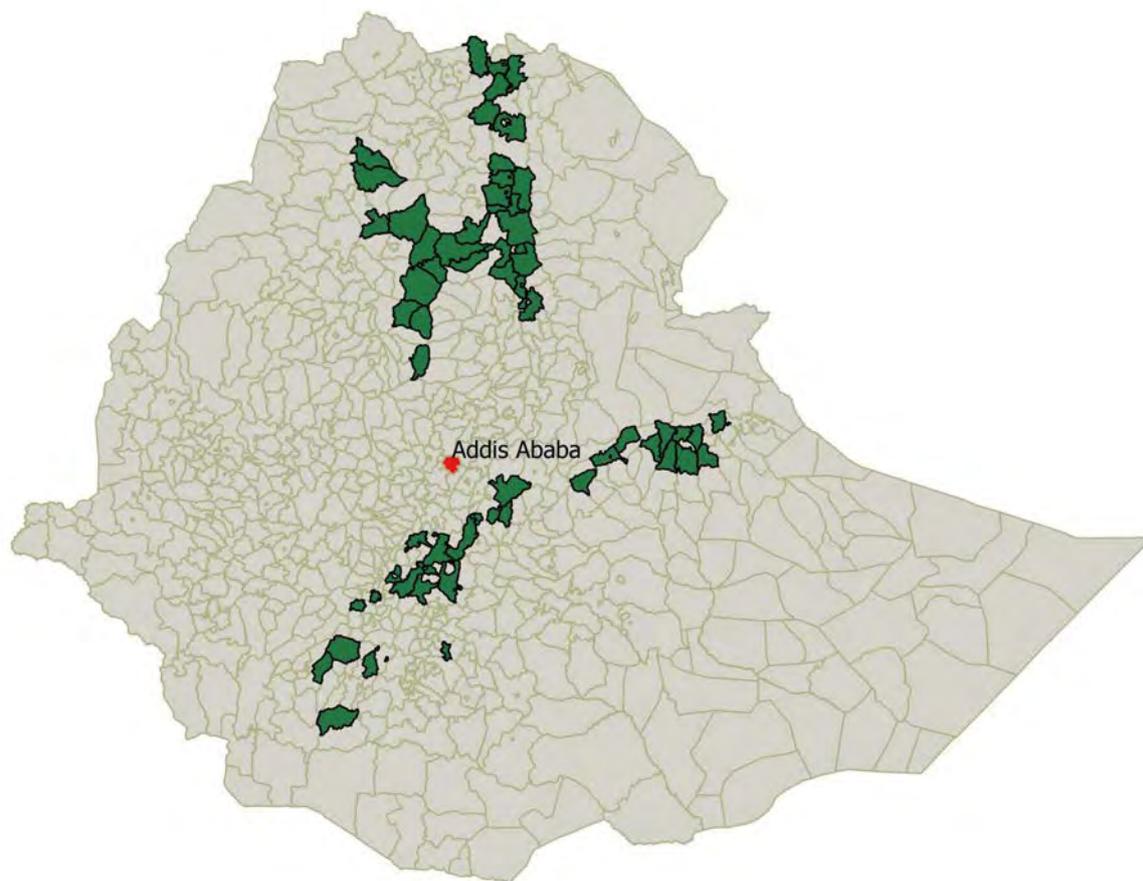
Banks showed interest to take more risk (80%) and avail credit to farmers through unions with minimum collateral (20%). The risk-sharing modality that was successfully piloted is ready for scaling and institutionalisation.

Challenges, opportunities, lessons learnt and way forward

- Attention for seed system development could benefit all woredas in the sesame zone. Access to quality seeds of improved crop varieties has increased, but much remains to be done to satisfy the basic seed needs of farmers and pre-basic seed requirements of seed producer cooperatives.
- Alignment with ATA is important for coordination, policy impact and the effectiveness and efficiency of activities. More intensive collaboration is required, especially at the Tigray side.
- Due to the distant location of the sesame zone in lowlands of NW Ethiopia, the linkages among BENEFIT partner programmes and the commitment for collaborative activities have been limited. The distance from Mekelle, Bahir Dar and Addis is far.
- For several subjects piloted and developed by SBN, there are good perspectives for scaling out and scaling up, especially: financial literary training, marketing credit and collaboration with banks, bottom-up planning, translation of research finding in practical extension materials and participatory training, communication channels for sharing information and experiences.
- Collaboration and partnerships require: timely planning, explicit budget allocation, regular communication, assignment of focal points.
- Documentation and experience capitalization: the evidences and success stories from the BENEFIT programmes and partnership and collaborative activities need to be documented and shared.
- Building ICT based information systems should be given primary importance as sourcing accurate information is almost impossible as a result high staff turnover and poor documentation culture.
- Collaboration is above all about collaboration with Ethiopian implementing partners. A key lesson is that this reduces the cost of activities, avoids duplication of efforts, improves reach and increase the results and impact at the level of end users.
- Working with stakeholders at local, regional and national level is essential to sustain the outcomes of all BENEFIT programmes.
- Transfer to local implementing partners (public agencies, research, farmers' organisations, companies, banks and MFI's) should always be part of the design of project activities.







Executive summary

Introduction

REALISE (Realising Sustainable Agricultural Livelihood Security in Ethiopia) is one of the five programmes in the BENEFIT Partnership designed for three years (2018–2020). The REALISE programme has been implemented in alignment with the Productive Safety Net programme (PSNP) of Ethiopian government.

Leveraging the experience of BENEFIT-CASCAPE and BENEFIT-ISSD, the programme focuses on validating, adapting and scaling of best fit practices (BFPs) in 60 Productive Safety Net Programme (PSNP) woredas. Eight Ethiopian Universities (Araba Minch, Arsi, Bahir Dar, Haramaya, Hawassa, Mekelle, Oda Bultum and Woldia) are the main implementing partners. The programme also closely works with Wageningen University and Research (WUR) in the Netherlands.

At impact level, REALISE aims to contribute to improved sustainable food security, income and trade among food insecure rural households in Ethiopia. The programme's goal is to bring enhanced human, organizational and institutional capacities for validating, adapting and scaling best fit practices for smallholder agriculture for increasing productivity and thus improving sustainable livelihoods in chronically food insecure PSNP woredas. Programme outcomes are:

1. Developed best fit practices that meet expressed needs and have the potential to contribute to increased productivity and resilience are available for scaling in selected PSNP Woredas;

2. Increased availability, timely delivery and use of quality seed of new, improved, and/or farmer preferred varieties through diverse channels;
 3. Enhanced human, organizational and institutional capacities for matching, adapting, validating and scaling best fit practices; and
 4. A conducive environment exists for the institutionalization of evidence-based system innovation.
- The programme started many of its activities in 2019 to achieve its goal; and achievements, challenges and lessons learnt of the programme are presented as follows.

Major achievements

Quality and quantity of sustainable production

- Over 130 validation, demonstration and pre-scaling activities have been conducted to generate best fit practices for PSNP agro-ecologies and socio-economic conditions;
- 51,798 smallholder farmers (38% females) accessed best fit practices which is 57% of the programme target of 90,000. Under the seed pathway 71,886 smallholder farmers (41% females) accessed quality seeds of improved varieties thus achieving 60% of the planned 120,000 farmers at the end of the programme;
- In total, 123,684 smallholder farmers were reached with improved practices and seeds that contribute to increased quality and quantity of agricultural production;
- 3,919 farmers accessed nutrition dense crops of legumes, fruits and vegetables out of which 50% were female farmers;
- The nutrition sensitive agriculture interventions include legumes (faba bean, field pea, haricot bean, mung bean, orange fleshed sweet potato, quality protein maize, papaya and vegetables among others);
- 68 best fit practices have been identified and tested for further use by smallholder farmers to increase their productivity; this achievement is 113% of the 2-year programme target;
- Productivity of major crops increased by a minimum of 80% and going over 1000% for smallholder farmers participating in interventions of the programme. This high increment is because of very low yield by PSNP households using local practices, low inputs agriculture and partly because of better rain in 2019 coupled with improved practices introduced by the programme;
- Crop portfolio (crop and variety diversity) increased between 130 and 1500% showing that previously, PSNP farmers were not accessing improved crop varieties;
- Over 7,000 farmers were trained (with 39% female farmers participation) on the importance and use of best fit practices and quality seeds so as to improve productivity and their resilience;
- PMU facilitated five in house training and organized more than five workshops;
- REALISE website and Twitter launched and made operational in 2019;
- WUR provided technical and managerial backstopping during planning, implementation, M&E, and programme management;
- All clusters achieved at least 30% women participation (except BDU) and over 40% youth participation.

Improved enabling environment

- About 400 farmers participated (47% females) in pilot interventions being undertaken to address systematic bottlenecks. Farmers are complaining about high cost of inorganic fertilizers in general in the country and in particular in PSNP areas where agricultural potential is low. The REALISE programme introduced the 1,000 Birr package approach where farmers use half the recommended amount of inorganic fertilizers with the equivalent of 4MT of farm generated compost per ha. There is also micro-dosing pilot trial where rate of fertilizer application is dramatically reduced because of better fertilizer placement closer to the plant;
- REALISE – in close collaboration with ISSD - played an instrumental role in the field visit of the state ministers (H.E. Dr. Kabba Urgessa, State Minister for Natural Resources and Food Security (senior adviser to REALISE) and H.E. Mrs. Aynalem Nigusie, State Minister for Agricultural Input and Output Marketing Sector of the Ministry of Agriculture). The visit was also attended by Mr Thijs Woudstra, Deputy Head of Mission and Dr Worku Tessema, Senior Policy Officer for Food Security & Sustainable Development of the Embassy of the Kingdom of the Netherlands (EKN) in Ethiopia;
- Pilots on poultry and small ruminants (sheep and goat) are underway to contribute to increased resilience of farmers and in other cases for off-farm income generation for youth;

- In-depth studies on future scenarios of Ethiopian agriculture under increasing population pressure, youth unemployment and integrated nutrition approach are underway;
- About 7,500 farmers participated (30% females) in farmers field days and shared experiences about improved agricultural practices used by farmers participating in the REALISE programme;
- 541 research and extension staff (about 16% female experts) have been trained on different topics as a part of capacity building on matching, adapting, validating and scaling best fit practices.

Collaboration

- 16 linkages established/strengthened between actors such as seed producers, service providers and markets, which is 53% of the 2-year target;
- A total of 3,919 farm households benefited from nutrition sensitive agriculture interventions, out of which the majority 1954 (50%) were women farmers and 667 (17%) were reported to be youth;
- REALISE joined tripartite partnership forum with ATA and SNV as per the recommendation of EKN;
- REALISE finalised baseline and PRA reports for 18 and 60 woredas, respectively;
- Eight PRA and baseline reports produced covering 60 and 18 woredas respectively;
- REALISE used multiple communication and sharing strategies to get across its message to farmers, experts, policy makers, organizations and donors;
- REALISE established strong collaboration with federal, regional, zonal, woreda and kebele level stakeholders. An MoU was signed with key partners both at federal (MoA, EIAR and ATA) and regional levels (RARIs, PSNP/Food security coordination office and BoA);
- Ethiopian higher officials who are senior advisors of the REALISE programme at national level visited Rwanda for experience sharing on December 9-13 2019. The visit stimulated interest on both sides to take it to the next level by establishing three members committees from the two countries and further defining joint mutual learning areas.

Challenges, opportunities, lessons learnt and way forward

Challenges

- Unexpected nature of rainfall in some locations, incidence of disease and pest mainly in Mekelle and Woldia clusters;
- The slow rate of willingness of farmers to implement the recommended practices;
- Shortage of quality seeds for some crops or varieties linked with one year engagement at field level;
- Bureaucratic procurement procedure at some partner universities;
- Some experts left the project at critical time;
- Limited availability of irrigation infrastructure to address moisture stress due to rain shortage;
- Difficulty to bring some institutions on board for collaboration because of their busy schedules;
- Insufficient number of PSNP beneficiary households in some target kebeles compared to the plan;
- Unexpected prevalence of landlessness among young PSNP member households to consider for agricultural practices that need land;
- Lack of commitment of some PSNP households, expecting free handout.

Opportunities

- Existence of supportive government offices that encourage alignment (extension, PSNP, research, NGOs);
- Availability of adequate meher season rainfall in 2019;
- Good collaboration with Ethiopian research system (EIAR and RARIs) which helps to access information and other government offices including at woreda and kebele levels;
- Existence of knowledge, experience and expertise within and outside the programme and within BENEFIT programmes to build on;
- Availability of farmers who are interested to use improved agricultural technologies due to the demonstration and pre-scaling activities;
- Availability of crop varieties and crop management suitable to divers agro-ecologies;
- Most beneficiaries are aware of nutrition importance;
- High demand for improved seed varieties and other best fit practices;
- Existence of formal and informal seed systems operating at community level;
- Readiness of farmers to test and adopt new technologies;
- Strong stakeholders' collaboration at national, regional, zonal, woreda and kebele levels.

Lessons learnt

- The 80:20 PSNP and non-PSNP target has been achieved but PSNP households are scattered which means that it demands too much time and effort to reach them;
- Intensification of crop production through multiple cropping was demonstrated in Meher season and helped PSNP farmers to produce more crops (through intercropping of maize and haricot bean and relay cropping of chickpea and teff) on the same plot and in one year, which contributes greatly to increased productivity;
- Flexible Programme management (agile principle) is applied in terms of changing crops/varieties as needed and modifying procedures to conduct activities when local context changes;
- Contribution to attitude change of stakeholders: for example, PSNP farmers can be self-sustain and effective when properly supported with appropriate agricultural technologies;
- REALISE innovation pathway (validation, demonstration, pre-scaling, scaling support) and the up or out principles instigate the woreda office of agriculture willingness to conduct pre-scaling and scaling support of proven best fit practices;
- Targeting of context specific interventions has allowed identification of proven technologies relevant for specific agro-ecologies and socio-economic conditions;
- Targeting of wives in male headed households helps to increase the number of female farmers targeted by the program. However, the level of engagement of the women to learn and benefit from the program activities varies from household to household;
- The targeting of whole families particularly improves women participation and engagement in home garden vegetables production, which contributes to nutrition security of a household;
- Partners and stakeholder's engagement from the beginning has improved the chance of success and institutional embedding;
- Coordination and facilitation of stakeholders is strongly needed for participatory project implementation approach;
- Considerations are needed for effective engagement of youth in the target woredas;
- Diversification of crop species and types is crucial to contribute to nutritional security of the PSNP households;
- Clearly defined roles and responsibilities and creation of sense of ownership paves ways for better collaboration with relevant stakeholders.

Way forward

- As 2020 is the last year of the programme, attention will be given to demonstration, pre-scaling of best fit practices and documentation;
- Weakly addressed performance indicators such as establishment/strengthening of linkage between seed producers, service providers and market, woreda plan support and provision of evidences to policy makers will be given more attention;
- Team building still needs attention in some clusters for effective programme management;
- Follow clustering approach for pre-scaling so that it would be convenient for field management and be more visible;
- Engage stakeholders in pre-scaling and scaling support from joint planning throughout;
- Follow adaptive strategy in innovation promotion (e.g.: seed for work for PSNP beneficiaries as a part of resilience building);
- Work on downsizing of packages (micro packaging);
- Follow whole family approach in introducing with time and labour-saving technologies (TLSTs). Rather than identifying technologies that directly contribute to reducing farm labour for women, look for technologies that would contribute to saving household labour in general. The assumption is if farm households have access to technologies that would facilitate their sowing, weeding, harvesting, threshing/ shelling and transporting activities, this will reduce the required labour from household members including women;
- In trying to increase the participation of women in farming activities, care should be taken not to increase their already overburdened work schedule;
- Finalize soil mapping on 18 woredas;
- Six policy dialogues will be organized with national and regional policy makers in 2020;
- 15 presentations will be made to stakeholders on best practices of REALISE;
- Piloting of innovation recommendation mapping on five woredas.

Table 1 REALISE reach in 2019

Reach indicator	University cluster/Region								Total reach in 2019
	Arba Minch	Arsi	Bahir Dar	Haramaya	Hawassa	Mekelle	Oda Bultum	Woldia	
Regions	SNNP	Oromia	Amhara	Oromia	SNNP	Tigray	Oromia	Amhara	4
Woredas	4	7	10	9	7	10	4	10	61
Hectares of farmland	98.25	130	69.75	31.1	52.58	144.65	173.81	653.8	1354
Farmers (direct)	2622	1769	2291	4832	1777	3212	2964	2978	22445
M =<35	260	385	366	246	228	260	657	166	2568
M >35	1044	685	1523	2106	803	1117	1219	1744	10241
F =<35	113	322	67	0	203	373	316	107	1501
F >35	1205	377	335	2480	543	1462	772	961	8135
% of F	50%	40%	18%	49%	42%	43%	37%	36%	40%
Farmers (indirect)	11948	10174	14911	19032	7966	16151	16330	15595	112,107
M	6003	5750	9180	9728	4,036	8740	9215	8697	61,349
F	5945	4424	5731	9304	3930	7411	7115	6898	50758
% of F	50%	43%	38%	49%	49%	46%	44%	44%	45%
Farmers' organizations	1	2	0	0	0	4	2	0	9
SMEs / entrepreneurs	0	1	0	0	4	0	0	0	5
Platforms	1	0	0	0	0	2	0	1	4
Knowledge and research institutes	2	2	2	2	2	2	2	2	16
Research and extension staff trained	0	50	149	84	27	49	21	159	541
Banks and MFIs	1	0	0	1	0	1	0	4	7
Improved technology/practices	6	8	10	11	6	10	9	8	68
Policy dialogue	0	0	0	0	0	0	0	0	0
Studies in strategic bottle neck (in-depth studies)	0	2	2	1	1	0	0	0	6
MSc study supported	0	2	2	0	0	0	0	0	4
Evidence-based policy options	0	0	0	0	0	0	0	0	0
Private sector association	0	0	0	0	0	1	0	0	1
Productivity increased against the baseline (%)									81-1073

Quality and quantity of sustainable agricultural production

In REALISE programme we target the following intermediary outcomes for contributing to increased quality and quantity of sustainable agricultural production:

- 1 Developed best fit practices that meet expressed needs and have the potential to contribute to increased productivity and resilience; increased availability, timely delivery and use of quality seed of new, improved, and/or farmer preferred varieties; and enhanced human and organizational capacities
 - 1.1 Best fit practices have been matched, adapted and validated based on capacity and vulnerability analysis and mapped for suitability against the bio- physical and socio-economic conditions in the selected woredas
 - 1.2 Targeted households/groups are able to and actually adopt the promoted practices and to improve their resilience
 - 1.3 Increased production and dissemination/marketing of quality seed by farmers and farmers group; by local seed businesses; and by private seed companies
 - 1.4 Increased demand for and availability of new, improved, and/or farmer preferred varieties among farmers
 - 1.5 Linkages established between seed producers and seed users for sustainable seed supply
 - 1.6 The capacity of extension, NGOs and other service delivery mechanisms to disseminate best-fit technologies through implementing scaling strategies is enhanced
 - 1.7 Best fit practices are part of woreda agriculture development plans and the work plans of NGO's and other interested organisations in selected PSNP woredas.)

Practice, Seed and Capacity building pathways

The REALISE programme contributes to increased quality and quantity of agricultural production through its practice, seed and capacity pathways. Best fit practices on crops and forages were matched and validated in REALISE intervention PSNP woredas. Practices including crops/varieties that are developed for conditions similar to PSNP woredas were matched and tested for adaptation based on integrated validation protocol of best practices that considers productivity, profitability, farmers preference, sustainability, gender and nutrition. Availability of new, improved, and/or farmers preferred varieties was primarily addressed through crowdsourcing. It is also enhanced through validation, demonstration and pre-scaling activities. Linkages were also established for input provision and markets to facilitate availability of quality seeds and other inputs.

Best Practice validation and adaptation

Over 130 best-fit practices were validated, demonstrated and pre-scaled across PSNP woredas involving 8853 farmers. Sixty-eight best fit practices/improved technologies have been identified based on farmers priority to be used by farmers (Table 1). The programme targeted to identify 60 best fit practices⁵ for scaling. Because of the high commitment of the programme team and availability of technologies that suit different agroecologies, the achievement reached 113%. Major crops in the validation and adaptation include wheat, maize, teff, sorghum, haricot bean, field pea, vegetable and fruits. The programme introduced farmers to a basket of best fit practice options: it introduced early maturing varieties of sorghum, maize (like Melkassa 2), wheat (Ogolcho, King bird)

⁵ Best fit agricultural practices refer to research recommended technologies for use but may require quick validation in a particular agroecological and socioeconomic settings for more refined use. For example, research released technologies based on six traditional agro-ecology but 33 elaborated agro-ecological zones exist in Ethiopia, similarly at least three socioeconomic classes (poor, medium and rich) of small holder exist in most parts of Ethiopia.

and teff, for example, to the areas with low rainfall while medium maturing varieties (e.g., BH661 maize) are introduced to areas with adequate rainfall, higher yield is also obtained. A total of 51798 farmers (57% of the 90,000 target farmers) were addressed both directly and indirectly with cross visit of four farmers per trial farmer and those who involved in the field day (Table 2) out of which 38% are female farmers.

Table 2 Number of farmers reached with best fit practices in 2019

University cluster	Direct			Indirect			Direct + Indirect		
	M	F	Total	M	F	Total	M	F	Total
Arba Minch	652	659	1311	2743	2685	5428	3395	3344	6739
Arsi	408	279	687	2948	1622	4570	3356	1901	5257
Bahir Dar	843	132	975	4406	957	5363	5249	1089	6338
Haramaya	665	601	1266	2953	2529	5482	3618	3130	6748
Hawassa	770	480	1250	1241	1135	2376	2011	1615	3616
Mekelle	646	470	1116	4021	2692	6713	4667	3162	7829
Oda Bultum	938	544	1482	4524	2425	6950	5463	2969	8432
Woldia	932	517	1449	3931	2132	6063	4863	2649	7512
Total	5368	3485	8853	26768	16177	42945	32136	19662	52471

Productivity of the farmers who participated in the intervention of the programme increased for many of the crops between 80 and 1073% (Table 3). Groundnut in eastern Ethiopia gave a yield below the baseline data because of an unfavourable climate compared to a long period of an average climate. The percentage increased for some regions and crops are very high because of different factors: the productivity data recorded in the baseline is very low because the PSNP farmers usually make limited use of improved agricultural practices and they are situated in areas less suitable for agriculture like low-moisture stress and degraded soil. The introduction of improved agricultural practices coupled with better rain in 2019 led to a large increase of productivity. Crops like finger millet and mung bean can be produced under low rainfall. Field management like Zai pit with organic fertilizer (compost) for conserving soil moisture in-situ and improving soil fertility proved to increase yield dramatically. The results of this year, therefore, showed that with the options of using crops and/or varieties that are tolerant to low rainfall condition and better field management, PSNP farmers improve their resilience to food insecurity.



Plate 1 Agricultural practices validation and promotion of improved maize and sorghum varieties with PSNP farmers

Table 3 Productivity of major crops under REALISE interventions in 2019

S/N	University cluster/Region	Crop/ variety	Type trial	Yield recorded (Qt/ha)		Yield increment over baseline (%)
				Trial yield 2019	Baseline yield 2017/2018	
1	Arba Minch/ SNNPR	Maize BH547	Demos	57	4.86	1073
2		Sorghum (Meko)	Demos	18	3.22	459.0
3		Haricot bean (Hawassa Dume)	Demos	20	4	400.0
4		Potato (Belete)	Demos	460	56.6	712.7
5	Arsi/Oromia	Maize (Melkassa 2)	Pre-scaling	27.38	15.09	81.4
6		Wheat (King bird)	Demos	33.8	14.65	130.7
7		Sweet potato (Hawassa-09)	Demos	292.7	60.24	385.9
8	Bahir Dar/ Amhara	Wheat	Demos	34.39	16.51	108.3
9		Malt barley	Pre-scaling	38.06	11.62	227.5
10		Haricot bean	Pre-scaling	18.2	7.6	139.5
11		Potato	Demos	296.29	62.84	371.5
12	Haramaya/ Oromia	Maize (Zai pit, Melkassa-2)	Validation	62.15	14.86	318.2
13		Groundnut	Demos	1700	1700	0
14	Hawassa/SNNPR	Haricot bean (Hawassa Dume)	Validation	32.2	5.9	445.8
15		Maize (BH661)	Pre-scaling	78.4	12.6	522.2
16		Sorghum (Dekeba)	Validation	31.7	9.6	230.2
17		Potato (Gudenie)	Demos	246.5	NA	NA
18	Mekelle/Tigray	Faba bean (Walki)	Validation	37.62	7.02	435.9
19		Food barley (HB1307)	Demos	36.3	8.11	347.6
20		Finger millet (Mereb-1)	Pre-scaling	31.5	7.8	303.8
21	Oda Bultum/Oromia	Sorghum (Jiru)	Demos	89.25	13.31	570.5
22		Haricot bean (SER125)	Demos	36.34	4.46	714.8
23	Woldia/Amhara	Sorghum (Girana-1)	Demos	47.6	6.06	685.5
24		Mung bean (N-26/ Rassa)	Demos	18.23	4.00	355.7
25		Teff (Zobel)	Pre-scaling	17	3.52	383.0

Increased access to quality and farmers preferred seed

Increased production and dissemination/marketing of quality seed

About 72,000 farming households in PSNP woredas got access to quality seeds of improved varieties (Table 4) in 2019, which is 60% of the target set for the end of programme. Farmers do not only access quality seeds but also learned how to compare and contrast the merit and demerit of different crop varieties. Farmers accessed quality seeds through their participation in validation, demonstration, pre-scaling, crowdsourcing and pilot studies like 1000 Birr package with small pack arranged with unions and cooperatives. Seed producer's cooperative are also involved in quality seed production.

Table 4 Number of farmers reached with quality seeds

University cluster	Direct		Indirect		Total		
	M	F	M	F	M	F	T
Arba Minch	652	659	3260	3295	3912	3954	7866
Arsi	662	420	2802	1834	3464	2254	5718
Bahir Dar	1046	270	4774	1104	5820	1374	7194
Haramaya	1815	1751	6775	6455	8590	8206	16796
Hawassa	747	463	2795	1955	3542	2418	5960
Mekelle	1189	907	4719	3661	5908	4568	10476
Oda Bultum	938	544	4690	2720	5628	3264	8892
Woldia	978	551	4766	2689	5744	3240	8984
Total	8027	5565	34581	23713	42608	29278	71886

Increased demand for and availability of new, improved, and/or farmer preferred varieties among farmers

Availability of new and improved varieties increased through testing and validating and crowdsourcing. The diversity of crop portfolio increased by 120 to 1550% for the participating farmers (Table 5). The programme targeted to diversify crops/and varieties by 50%. There were relatively good numbers of improved varieties in woredas under Bahir Dar, Arsi, Hawassa and Mekelle university clusters even before REALISE intervention. It was still possible to increase diversity of different crop varieties for these clusters. Farmers under Haramaya University cluster had limited access to improved varieties before. Last year the cluster introduced a number of varieties of haricot bean (food and market type) and sorghum through crowdsourcing in addition to the validation, demonstration and pre-scaling trials, which resulted in a high increase of the percentage from the baseline.

Table 5 Diversifying crop varieties in the hands of farmers through REALISE interventions

University cluster	#Crops	Number of varieties		Increment over the baseline (%)
	REALISE 2019	Baseline	Reach 2019	
Arba Minch	12	5	21	320
Arsi	14	13	39	200
Bahir Dar	13	15	33	120
Haramaya	12	4	66	1550
Hawassa	5	11	32	191
Mekelle	17	11	48	336
Oda Bultum	15	5	28	460
Woldia	13	4	36	800
	101	68	303	

Linkages established between seed producers and seed users for sustainable seed supply

Linkages have been established or strengthened for the farmers to easily access quality seeds and services. Sixteen linkages among farmers seed producers and service providers were established/strengthened in 2019 (Table 6) reaching 53% of the target of the programme. Arba Minch University cluster is capacitating Hibret Firie Seed Producers' Cooperative Union while Bahir Dar and Mekelle have started working with a number of seed producers cooperatives (SPCs).

Table 6 Linkage established/strengthened

University cluster	#Linkage	Description
Arba Minch	1	One seed system linkage is initiated with Arba Minch Hibret-firie seed union/cooperative.
Arsi	0	
Bahir Dar	5	Linkages established between seed producers and inputs, services and markets in 2019 by the cluster.
Haramaya	2	Linkage was established with Farmers' Cooperative Unions (i.e. for seed input supply); Afran Kello and Haramaya farmers cooperatives with farmers.
Hawassa	0	
Mekelle	5	Linkages with Hayalo SPC, ShewitTekea SPC, Lemlem Sesat SPC and Suta SPCs, SPC in Gantaafeshum.
Oda Bultum	1	Linkage between LSB and union for technical supervision and market; seed market platform.
Woldia	2	Linkages between seed producers and inputs, services and markets established (potato seed producers with cooperatives; seed producers and seed quality assurance services).
Total	16	Linkages established (53% of the targeted 30 linkages).

Capacity Building

The capacity of extension, NGOs and other service delivery mechanisms to disseminate best fit technologies through implementing scaling strategies is enhanced

The PRA findings and stakeholder analysis of REALISE revealed capacity gaps to access and use agricultural technologies by farmers due to factors associated with knowledge, skills and finance. Stakeholders also reported different capacity related factors hindering them from delivering the required level of services to farmers. On the other hand, the capacity of program staff also needs to be improved to ensure that they have the required set of knowledge and skills to implement the planned activities. A rapid internal capacity gap assessment was conducted to identify the training needs of the REALISE program staff. Accordingly, the capacity building promoted covered (i) capacitating target smallholder farmers in technology adaptation, (ii) provision of short term training for extension agents and SMS, (iii) promotion of experience sharing among farmers and extension workers through field days and exchange visits, (iv) capacitating woreda office in proper planning, and (v) experience sharing for higher officials abroad to contribute to enhanced human, organizational and institutional capacities.

Different types of capacity building activities were planned and implemented at different levels. At community level, in-situ trainings that are attached to activities planned under the practice pathway were provided to target households. The aim of these trainings was to orient farmers on basic information on the appropriate agronomic practices of a trial (validation, demonstration, pre-scaling, crowd sourcing, Participatory variety selection, home gardening, etc.) of a given crop. Here, attention was given to the participation of women and youth. The 2019 annual reports show that, a total of 7,328 farmers attended the farm level trainings, out of which 3,324 (45.4%) were youth under the age of 35 while 2,895 (39.5%) were women. See the table below for cluster level disaggregation.

Table 7 Number of farmers participated in in-situ trainings

SN	Cluster	Male		Female		Total
		<35	≥35	<35	≥35	
1	Mekelle	746	127	478	179	1,530
2	Bahir Dar	229	486	279	287	1,281
3	Woldia	206	470	78	201	955
4	Haramaya	131	275	44	132	582
5	Arsi	254	433	208	241	1,136
6	Oda Bultum	236	439	237	290	1,202
7	Hawassa	48	188	29	112	377
8	Arba Minch	100	65	21	79	265
Total		1,950	2,483	1,374	1,521	7,328
% of from total		27%	34%	19%	21%	

Furthermore, field days and exchange visits were organized at woreda and kebele levels to share experiences among farmers; create awareness on the newly introduced technologies and practices; to create linkages and promote collaboration among different partners; gather feedback from experts on areas of improvement as well as discuss on the way forward. A total of 7,328 farmers participated in field days out of which 2,895 (39%) were female.

Table 8 Number of farmers participated in field days

S/N	Cluster	Male	Female	Total
1	Mekelle	1437	812	2,646
2	Bahir Dar	1034	429	1,721
3	Woldia	203	64	314
4	Haramaya	293	125	492
5	Arsi	1316	506	2,143
6	Oda Bultum	773	249	1,202
7	Hawassa	105	3	127
8	Arba Minch	135	49	217
	Total	5296	2237	7533
	% from total	70%	30%	

REALISE mainly partners with the Federal Ministry of Agriculture along with its implementation structures at regional, zonal and woreda levels, and Agricultural research institutes and centres. As such strengthening the capacities of those partners was crucial to ensure that required services and support are provided to the farmers. Experts from the woreda office of agriculture, development agents, extension workers and researchers were trained in various topics such as seed production, nutrition sensitive agriculture, crowd sourcing and PV, validation, demonstration and scaling up of best fit practices, post-harvest management, etc. See table below for further details.

Table 9 Number of woreda experts received training

S/N	Cluster	Topic of the Training	Number of Participants		
			Male	Female	Total
1	OBU	TOT in quality seed production and post-harvest management	20	1	21
2	MU	TOT for woreda partners on new technologies and scaling activities (including crowdsourcing)	14	2	16
		TOT on Nutrition Sensitive agriculture (NSA)	27	8	35
3	BDU	Data Collection and Management	62	34	96
		TOT on Nutrition Sensitive agriculture (NSA)	47	6	53
4	HrU	Crowd sourcing and PVS	70	5	75
		Validation, Demonstration and Scaling up Methodologies	9		9
5	HwU	TOT on Data collection for CS and PVS	23	4	27
6	WU	Bread wheat seed production and crowd sourcing model training	28	1	29
		scaling up of best fit practices and agronomic practices	70	19	89
		Nutrition Sensitive Agriculture (NSA)	34	7	41
7	ArU	TOT on Post harvest management, Agriculture- Nutrition Linkages and Bottom up planning	50		50
		Total	454	87	541

REALISE National Program Management Unit (NPMU) also organized and conducted trainings for its cluster experts and staff on Gender in Agriculture and Nutrition Research Programs, Nutrition Sensitive Agriculture, seed, Integrated pest Management, M&E and qualitative research. These trainings were specifically organized for REALISE program staff and cluster experts so as to address the identified skill gaps for better implementation of planned activities, data collection and documentation.

Senior advisors of REALISE programme visit Rwanda to contribute to enhanced human, organizational and institutional capacities

Ethiopian higher officials who are senior advisors of REALISE programme at national level visited Rwanda for experience sharing on December 9-13 2019. The visit was led by his H.E Dr. Kaba Urgessa, State Minister, MoA, heading the Natural Resources and Food Security Sector and consisted of Dr. Mandefro Nigussie, Director General of Ethiopian Institute of Agricultural Research (EIAR) and W/ro Yenenesh Egu, Director of Agricultural Extension, MoA. The advisors were accompanied by three REALISE programme management team members.

The visit was organized by the REALISE programme in consultation with Rwanda Cooperation Initiative. The objective of the visit was to learn good experiences from Rwanda and in turn to contribute to Ethiopian institutional capacity building targeted by the programme. To achieve the objective of the visit, the team visited and discussed with the Rwandan Ministry of Agriculture and Livestock Resources, Rwanda Agriculture Board (RAB), Rwanda Cooperation Initiative (RCI), the Netherlands Embassy to Rwanda, Ethiopian Embassy to Rwanda, Bank of Kigali in Kigali. A field visit was also made to the potato value chain in the Musanze district of Northern Province and soil conservation terraces in Ngororero district of Western province. Experiences on the potato value chain, support from Bank of Kigali in credit supply for inputs in non-cash approach and the interface of agricultural research and extension are good experiences, among others, that the Ethiopian delegate consider highly relevant. The homegrown solution called *Imihigo* has helped Rwanda to change the long standing political, social and economic challenges it faced. For the near future, teams have been established from both countries to identify areas where the countries can learn from each other through well planned exchange visit.

Best fit practices are part of woreda agriculture development plans and the work plans of NGO's and other interested organisations in selected PSNP

This intermediary outcome will be addressed after evidences are generated through validation, demonstration and pre-scaling. The target for this activity will be implemented in 2020.

Mainstreaming social inclusion and nutrition

Mainstreaming social inclusion received attention during staff recruitment, training, PRA and baseline surveys. In the PRA exercise, for example, about 50% female farmers were heard to identify the agricultural constraints they face, their access to and control over productive resources and available opportunities. To capture their indigenous knowledge and needs, a focused group discussion was made with female farmers for seed and nutrition in the PRA. Moreover, a problem ranking exercise was conducted with youth groups and low asset farmers to assess the specific needs and interests of these groups so as to inform the planning of activities to address their needs in the 2019 annual plan.

The REALISE program document stipulated that 30% of the target beneficiaries of the program should be women. Moreover, inclusion of youth and other vulnerable community groups was provided. Accordingly, gender and social inclusion considerations were integrated in the preliminary surveys (baseline and PRA), activity planning, implementation and monitoring. As a strategy to ensure that the target number of women farmers are reached by the program, both female headed households as well as wives in male headed households were targeted.



Plate 2 H.E Dr. Kaba Urgessa received by Rwanda Minster of Agriculture and Animal Resources

In 2019, a total of 22,445 farmers were directly reached by the program through planned activities under the practice, seed, capacity building and system innovation pathways. Out of which 9,636 (43%) were women and 4,069 (18%) were youth under the age of 35. From the 112,107 indirect beneficiaries reached this year, 45% were women. Looking at the nutrition interventions under the practice's pathway, special attention was given to target women due to their biological

nutritional requirements as well as their socio-economic and cultural vulnerabilities to food shortages. Accordingly, 50.6% (1984) of the total target farmers under nutrition activities (3,919) were women. Looking at the age disaggregation, 17.8% were young farmers.

The PRA reveal that rural women have heavy work burden as compared to men as they are responsible for the household domestic tasks and also contribute to farming activities especially in sowing, weeding, transportation, and storage. Based on this finding, REALISE planned interventions that will minimize the time and labour of women in the target communities. Accordingly, three (3) time and labour-saving technologies were selected and promoted in four clusters. These are: Enset processor in Hawassa and Arba Minch, Potato digger in Mekelle and ground nut scrapper in Arba Minch. Hawassa and Arba Minch were able to demonstrate the Enset processing technology. A total of 70 women benefited in the two clusters. The latter two are not implemented this year. The potato digger is postponed for 2020 because production of the machine takes longer than expected. However, the ground nut scrapper is dropped because it was impossible to find validated ground nut scrapping technology from the existing agricultural research institutes and centres. In order to capture the results from the activities being implemented, gender and social inclusion were integrated in the program M&E system through the data collection tools and methodological notes. As such, staff were oriented on the data collection tools as well as what data will be collected when by whom.

Nutrition

REALISE is being implemented in PSNP woredas which are both food and nutrition insecure. One of the program key performance indicators is to increase the Dietary Diversity Score (DDS) of its target households over project period. As part of the program baseline survey, DDS of the target households was measured to learn the existing consumption patterns so as to inform the appropriate interventions to be planned. From the baseline, it was learned that most of the target beneficiaries predominantly consume cereal based foods with limited consumption of vegetables, fruits and animal source foods. REALISE, then, opted to intervene to increase the production of diversified vegetables and fruits to increase availability of these foods. Vegetable crops such as carrot, beet-root, swiss chard, head cabbage, and Kale were widely demonstrated as backyard vegetables. In addition, spinach, tomato, chilli pepper, onions and pumpkin seeds were distributed depending on the specific agroecology and local context of the intervention area. Overall, all clusters demonstrated diversified home gardening using at least four (4) vegetable varieties in all of their woredas. A total of 3,919 farm households benefited from nutrition sensitive agriculture interventions, out of which the majority 1954 (50%) were women farmers and 667 (17%) were reported to be youth.

With regard to fruits, all clusters except Hawassa demonstrated the production of Maradol papaya variety as a backyard fruit. A total of 1,896 (40% women) farmers received papaya seeds and seedlings. Among these farmers, 376 (19.8%) were youth, out of which 46% were female youth. In addition to papaya, other fruits such as avocado, mango and banana were also demonstrated. Other activities under this theme include demonstration of bio-fortified crops (haricot bean, orange fleshed sweet potato) and improved varieties of Irish potato and sweet potato.

Conclusions and recommendations

Achievements

- National and regional programme teams have been established and sensitised with programme goal, approaches, result chain, theory of change and principles;
- Key stakeholders are identified and collaboration modalities are being prepared;
- Woreda profiles were prepared to support technology matching;
- Alignment with agricultural research institutes (EIAR & RARIs) is being done, areas of collaboration identified and selection of agricultural technologies presented;
- Training on PRA, baseline survey and technology matching was conducted for staff;
- Best fit practice/technology matching has been undertaken with CASCAPE, ISSD and research institutes (EIAR & RARIs);
- Some demonstration and pre-scaling of best fit practices started in the off-season using irrigation.

Challenges, opportunities and lessons learnt

- Unavailability of higher officials in some institutions for meetings and workshops to strengthen linkage appears a problem. Careful strategies (like informal communication, previous relationship, meeting arrangement at their convenience, etc) should be designed to bring them on board for better support and institutionalisation of the programme approaches.
- Availability of best fit practices and technologies from CASCAPE, ISSD and research institutes for matching with conditions of REALISE woredas is a good opportunity to reach the food insecure farmers in PSNP woredas in shorter time.
- Work load because readjusting of the 2018 work plan caused by late approval of the programme. However, the life span of the programme and available resource including human power should be taken into consideration while planning and deciding the number of activities.
- Dependency syndrome of some PSNP households was observed during the discussion with communities during PRA and baseline. This is an opportunity as some farmers want to become independent and the government is also interested in avoiding/reducing dependency syndrome. Therefore, discussions with the community will be planned to change their attitude towards aid and encourage them to become independent.

Way forward

REALISE will focus on the four pathways in 2019: Practice, seed, capacity development and system innovation, the first three pathways contributing to the first pillar of BENEFIT (increased quality and quantity of sustainable agricultural production) while the 4th pathway, system innovation contributes to the 3rd pillar of BENEFIT (improved enabling environment). Based on communities' problems identified during PRA and feedback from experts:

- Regional review and planning workshop of 2020 will be conducted to improve the work plans;
- Food gap months and DDS survey will be conducted to measure changes against the baseline;
- Implementation of planned activities to tackle the identified problems related to crop and livestock production, seed, nutrition and climate change through technology validation, demonstration, and pre-scaling;
- Socio-economic studies including social experimentation and in-depth studies will be conducted to address systemic bottle necks;
- Further strengthen the collaboration with PSNP programme, research institutes and extension offices;
- Continue with the capacity development of extension staff, REALISE staff and Research centres.

Improved enabling environment

In REALISE we target the following outcomes for contributing to an improved enabling environment for the agricultural sector:

3	A conducive environment for the institutional embedding of evidence-based system innovation
3.1	Results of pilots and studies are available and being exchanged and discussed at relevant stakeholder platforms (fora)
3.2	Ethiopian implementing partners and relevant stakeholders are constructively involved in programme generated/related policy issues

A conducive environment for the institutional embedding of evidence-based system innovation

Soil and innovation recommendation mapping: In 2019, REALISE Programme has played a key role in bringing soil and innovation recommendation mapping to the attention of the Federal Ministry of Agriculture (MoA) to overcome the long-standing problem of soil fertility and natural resources management and the aligned challenges of technology promotion using suitability mapping. After a consecutive discussion an MoU was signed between MOA and BENEFIT and a task force was established comprising of seven members representing MoA, ATA and BENEFIT partnership to support the implementation of soil and recommendation mapping. The task force held a periodic meeting and made recommendations on scale, approaches, and played an instrumental role in local consultants' identification. It also reports its progress to the state minister of natural resources and food security. REALISE with close collaboration with the MoA identified six lead soil surveyors and 12 assistant soil surveyors for 18 woredas soil mapping. Thus far various activities were accomplished including a five-day training that was organized for 18 professionals (six lead soil surveyors and 12 assistant surveyors) by REALISE programme in collaboration with International Soil Reference and Information Centre (ISRIC). The training mainly focused on pre-field, field and post-field activities, with specific emphasis on a shared approach in collecting soil data adhering to similar standards for producing a coherent dataset of high quality for soil characterization and mapping. High resolution (50 meter), country wide base map for soil/land resource mapping has been prepared by ISRIC. The base map with this fine resolution is a major breakthrough and important deliverable for the country to improve its capacity in soil mapping and characterization. Logistics for soil survey has been arranged for 12 woredas (requisition, purchase and distribution) and 4 survey teams deployed to the field (4 lead soil surveyors and 7 assistant surveyors).

Table 10 Summary of soil mapping joint activities with MoA

Region	No. of trainees	Trainers	Name of woreda selected for soil mapping	Status of soil mapping
SNNP	3	Johan Lennars (ISRIC, trainer)	Mirab Abaye, Silti and Kacha Bira	Started
Amhara	6	Stephan Mantel	Libo Kemikem, Enebise Sar Midir, Lay Gayint, Habru, Raya- kobo and Wadla	Started
Oromia	6	(ISRIC, trainer)	Dedder, Jarso, Kersa, Arsi Negele, Sire and Doba	Not Started
Tigray	3	Ashenafi Ali (REALISE, training coordinator)	Ahferom, Sa'esie Tseda Emba and Hawzien	Started

The soil mapping activity implementation has been started on 12 woredas at the scale 1:50,000 with the technical support and backstopping of International Soil Reference and Information Centre

(ISRIC). This semi-detailed soil mapping work for agriculture development purpose is the first of its kind in the country and the MoA has included the REALISE approach to be scaled on more than 400 woredas in its 10 years strategic plan. The task force has suggested the importance of standardization of soil mapping and soil laboratory procedure. The MoA has been carried forward the suggestions and a detailed framework has been prepared for six thematic areas: soil mapping, soil laboratory, soil biology, agriculture and water, watershed management and agronomy and soil fertility.

Fertilizer type and rate validation: Ethiopian Soil information system (EthioSIS) has produced soil fertility maps for the four main regions of the country, Tigray, Amhara, Oromia and SNNPR. Using those soil fertility maps (soil fertility atlas), district level multi-nutrient balanced fertilizers containing N, P, K, S, B and Zn in blend form have been issued to ameliorate site specific nutrient deficiencies and thereby increase land, water and labour productivity. However, validation of these maps and the recommended fertilizers rate are remaining undone. To overcome the problems of blanket recommendation of fertilizers, REALISE has initiated collaborative activities with EthioSIS project of ATA and Ethiopian Institute of Agricultural Research (EIAR) and Ministry of Agriculture (MoA) with tripartite MoU agreement.

Table 11 Summary of fertilizer validation joint activities with EIAR and ATA

S/N	Centre	Test crops	Testing district
1	Fogera	Wheat	Lay gaint
2	Fogera	Teff	LiboKemikem
3	Wondo Genet	Teff	Silti
4	Wondo Genet	Maize	Halaba
5	Mehoni	Sorghum	Raya Azebo
6	Mehoni	Teff	Raya Alamata
7	Mehoni	Wheat	Endamehoni
8	Kulumsa	Wheat	Dodota
9	Kulumsa	Maize	ZewayDugda
10	Chiro	Sorghum	Chiro

The fertilizer validation activities have been implemented by five Agricultural Research Centres under EIAR with the involvement of ATA and BENEFIT REALISE on four major cereal crops (maize, sorghums, teff and wheat) which are occupying significant position in terms of area coverage and volume of production. A team of five from MoA, ATA, REALISE and EIAR has visited the performance of the fertilizer validation on farm activities implementation by three Agricultural Research centres.



Plate 3 Fertilizer validation experiment on wheat and maize

System innovation for ensuring enabling environment through pilots and in-depth studies:

System innovation pathway of REALISE is designed to generate new insight and evidences by addressing systemic bottlenecks through piloting of innovative practices and conducting in-depth studies. As PSNP areas where REALISE programme operating is experiencing systemic challenges that could not be addressed by technology transfers and conventional wisdoms, piloting nonconventional approaches and knowledge generation is critically important. The system innovation pathway, therefore, gives the programme a greater opportunity to pilot promising innovative practices and study systemic bottlenecks to inform action and initiate policy dialogues. The programme invites top professionals and government officials during the early planning and incorporates their view in the designing of the pilot interventions and in-depth studies. The participation of stakeholders in the implementation and monitoring and evaluation of the pilot interventions and in-depth studies were strong and ensured ownership and commitment for institutionalization. The implementation brings together regional (Research, extension, private sectors, NGOs) and grassroot level actors (Woreda office of agricultures, Development agents, youth and women) for facilitating joint learning and inform actions.

Pilots

A total of 13 pilot activities were approved for implementation in 2019. They are designed to address systemic challenges related to resilience building, youth employment, risk management and nutrition. The five pilot interventions are geared towards resilience building with specific innovative introduction of dairy goats (1), poultry production (3) and supply of weather information (1) for timely decision making. The small ruminant and poultry related resilience pilots consisting of all the necessary success factors such as awareness raising and technical training for beneficiaries, training of development agents and subject matter specialist, animal feed and fodder development, veterinary services, access to finance, housing, marketing and consumption of animal product and biproducts for better nutritional wellbeing. The resilience pilot's implementation in 2019 demonstrated that small ruminant introduction with full package can improve the resilience of poor households and contributed to asset holding, improved nutrition and income.



Plate 4 Dairy goats pilot interventions in Mekelle University cluster

Rural youth unemployment is a significant challenge in REALISE intervention areas and some of the employment generation efforts are failed to be sustainable. REALISE programme assess employment creating opportunities in rural area settings taking into account the capacity of the targeted beneficiaries, experiences, the intervention success rate, potential support from other stakeholders and market linkages. Six of the 13 pilot interventions were on scalable youth employment and include introduction of improved charcoal making technology, small scale poultry production, small ruminant fattening, essential oil extraction and nursery development. Half of youth employment pilots are on preparatory phase while the other half is implemented and will be continued in 2020. The implemented pilots carefully designed to ensure sustainability and exploiting success factors. The implemented small-scale poultry production and small ruminant fattening demonstrated high potential for youth employment.



Plate 5 Sheep fattening and poultry enterprise pilots for youth employment in Woldia University cluster

The low-cost and low-risk pilot interventions have been implemented to demonstrate risk management and reach the poor segments of the community who are risk averse. The 1000 Birr wheat package was implemented into two ways: using half rate of vermicompost and inorganic fertilizers and recommended rate of inorganic fertilizers only. The former has increased productivity by 118.8% while the latter increased by 58.3% compared to the baseline. Fertilizer micro-dosing on the yield of sorghum was validated using different rate of fertilizers. The findings show that in moisture stress areas fertilizer micro dosing is effective. Out of the five treatments application of 1/2 inorganic + 1/2 compost and sole application of recommended inorganic fertilizer gave 21.3qt/ha and 23.3qt/ha respectively.

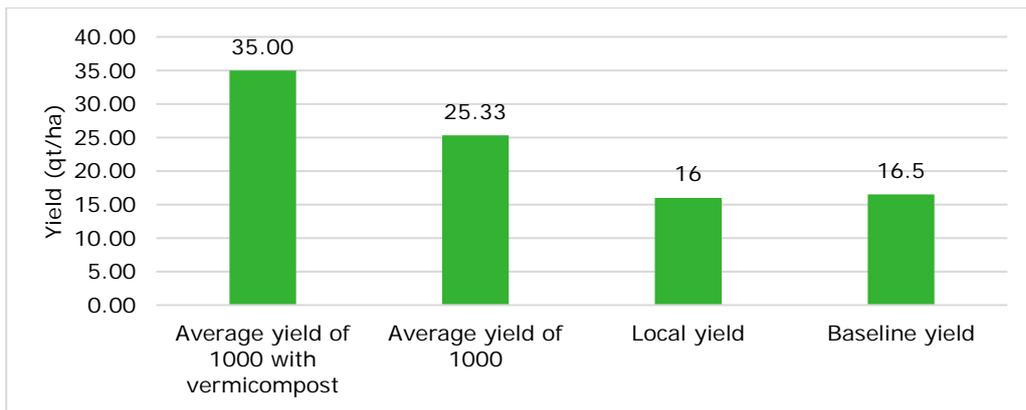


Figure 1 1000 Birr package on wheat crops at Bahr Dar University cluster

Table 12 Pilot intervention activities progress and results

Cluster	Pilots	Theme	Reach		Progress
			M	F	
Mekelle	1. Integrated dairy goat development	Resilience	0	35	Resilience building and feeding dairy goats for children
	2. Pilot study on dissemination of weather information to PSNP community towards reducing the risk of climatic variability	Resilience	0	180	The supply of weather information improves decision making under the face of weather uncertainty. This activity is implemented in collaboration with REST (GRAD II Project) and Tigray Meteorology Service.
Bahir Dar	3. Introduction of Improved charcoal making technology	Youth employment	25		Feasibility study has been conducted.
	4. 1000-birr wheat technology package	Low-cost & low -risk	45	15	The 1000 Birr pilot has resulted in 118.8% and 58.3% increase in productivity with and without respectively
Woldia	5. Small scale poultry production for youth employment	Youth employment	8	8	Daily egg production rate out of 50 chicken/per youth is 36 (72%) and 42 (84%) respectively
	6. Small Ruminant fattening for resilience building	Youth employment		16	On average, a woman participant can earn an estimated net profit of ETB 3000 to 5000 from the sale of five sheep.
	7. Pilot study of fertilizer micro-dosing on the yield of Sorghum in Moisture deficit Areas of Eastern Amhara Region	Low-cost & Low-risk	4	1	Out of the five treatments, application of ½ inorganic + 1/2 compost (21.3qt/ha) and sole application of recommended inorganic fertilizer (23.3qt/ha) gave highest yield.
Haramaya	8. Small ruminant fattening (goat) in PSNP communities of eastern Ethiopia	Resilience	0	40	Memorandum of understanding (MoU) was prepared and signed among the implementing partners in Haramaya Woreda.
	9. Pilot testing of poultry production: an implication for resilience of PSNP community of Eastern Ethiopia	Resilience	0	40	For the poultry production activity, the pullets were ordered from Genesis farm of Bishoftu and poultry house construction and target selection are completed.
Hawassa	10. Pilot on Scalable Youth Employment on Small Scale Poultry Enterprise	Youth employment	7	13	All the necessary inputs for poultry production (hay-box brooders, feeders, drinkers, vaccines, feed for two months, 2000-day-old chicken, etc.) were supplied by linking them with coops
	11. Pilot scalable Youth Employment on Small Scale Essential Oil Extraction	Youth employment	0	10	Business feasibility was conducted and it is proved that oil extraction is profitable investment. Besides, private industry that have capacity to design and install wet steam distillation apparatus was made.
Arsi	12. Integrated Nursery Development for youth groups	Youth employment	14	8	The preliminary work such as organization of the youth, procurement of materials and securing nursery site has done.
	13. Poultry intervention for women to enhance integrated resilience: implication for gender empowerment	Resilience	0	30	Training on poultry management aspects was given. Poultry mini house that accommodate 5 pullets constructed individually. The programme procured 150 pullets and feed for three months.
			103	396	

In-depth studies

Six in-depth studies on the theme of nutrition, risk management, future scenario and youth employment has been initiated. The main objectives of the in-depth studies are to generate evidence and adequate insight on systemic challenges to initiate policy level dialogue and action. The findings of all the in-depth studies will be used as inputs to initiate dialogues with policy makers in 2020.

Table 13 Summary of in-depth studies progress

Cluster	In-depth studies	Theme	Status
MU	Integrated nutrition development for resilience building	Nutrition	180 women participants (90 WASH ONLY AND 90 non-WASH) took part in the experiment
BDU	Pro poor saving, credit and insurance services in western Amhara region	Risk	The study is conducted in four woredas and kebeles. A total of 32 male and 26 female farmers participated in the focus group discussion. Data from focus group discussion is being analysed and key informants' interview will soon be carried out.
	Seasonal youth migration in Lay Gaynt and Shebel Berenta Woredas	Future scenario	Under preparation phase
HrU	Population Pressure, Migration and Land Use Dynamics: The Case of PSNP Communities of Eastern Ethiopia	Future scenario	Under preparation. ToR developed and consultant identification is started.
HwU	Assessment of key Barrier and Bottlenecks to Improve Nutritional Status of Mother and Children	Nutrition	Data collection finalized form 900 households
AU	Scalable Youth Interventions: the case of selected PSNP Woredas	Youth employment	Ongoing. Thus far, ToR developed, consultant recruited, study instruments developed and data collection is underway.

Mainstreaming social inclusion and nutrition

The in-depth studies and research pilots mainly deal with systemic bottlenecks and issues of social exclusion which among others focus on youth, gender and economically weak section of the community. Most of the pilot interventions designed to ensure social inclusion of the marginalized section of the community. REALISE demonstrated that if appropriate interventions designed and institutional support provided women and youths, the poor and vulnerable groups can actively participate in development activities and share from equitable distribution of benefit. In the total of 13 pilot activities implemented or started in 2019, 441 participants were reached out of which 59% and 47% were women and youths respectively. The figures show adequate attention has been given by REALISE programme to ensure social inclusion.

Conclusions and recommendations

Achievements

- Out of the 13 pilots; seven were implemented and six are ongoing;
- The pilot interventions ensured social inclusions (59% and 47% were women and youths respectively);
- The participation of stakeholders in the pilot intervention planning, implementation and monitoring and evaluation was strong and demonstrate the feeling of ownership and commitment for institutionalization;
- The pilots are designed to address the whole value chain or put in place the right institutional arrangements such the inputs procurement, capacity building to enhance technical know-how, access to finance, output marketing and access to information.

Challenges, opportunities and lessons learnt

Challenges

- Lack of documented evidences and information on various pilots and efforts by stakeholders;
- Preferences of shortcut approaches for success among youths and other potential beneficiaries;
- Poor supply system and inadequate capacity of suppliers for some inputs such as pullets, feed, machineries etc.;
- The government organizations show limited flexibility to accommodate new ways of doing;
- The short life span of REALISE programme hamper the evidence generation and institutionalization given the multifaceted challenges facing PSNP areas.

Lessons

- The pilots and in-depth studies give the programme out of the box thinking;
- The pilot interventions ensure social inclusion particularly for women, youth and poor farmers;
- Stakeholders require time and space to endorse new way practices and way of doings;
- Small ruminant and poultry are good entry points for resilience building, job creation and other spill over effects such as income and nutrition;
- Non-agricultural investments require huge investment, market linkage and it ensures high return over investment;
- The rounds of discussion with stakeholders and the expert panel narrow down the focus of pilot interventions and in-depth studies scope and type.

Way forward

- Finalize ongoing pilots and in-depth studies;
- Documentation and communication of the pilots and in-depth study findings;
- REALISE programme will create forums for policy dialogues and to inform actions of stakeholders based on the findings of the pilot interventions and in-depth studies.

Collaboration

M&E and communication

REALISE set up its own M&E framework well aligned to BENEFIT partnership. Monitoring and Evaluation of the REALISE programme serves two purposes: accountability to the donor and learning for impact and informing action. The M&E system of REALISE integrate a mix of qualitative and quantitative methods of data gathering, with strong focus on participatory approaches and methods to promote the use of M&E information. For accountability purposes a leaning oriented M&E framework was designed in line with the existing BENEFIT M&E system. The responsibility of monitoring lies with the programme manager and cluster managers, while M&E senior expert and focal persons at cluster facilitate grassroots level engagement for the regular monitoring and reporting.

BENEFIT Collaboration

REALISE carried out collaborative activities with ISSD and CASCAPE. REALISE and ISSD programme have implemented collaborate activities on four commodities in eight woredas with the objective of ensuring seed security in PSNP woredas. The programme collaborated with CASCAPE limited only to papaya and malt barley commodities in Mekelle and technical backstopping and capacity building areas in other clusters as there is a mismatch between the intervention woredas of the two programmes. However, a total of 10 CASCAPE best fit practices matched with the conditions of REALISE target woredas and were promoted with adaptation to the local context using REALISE validation, demonstration and pre-scaling modalities.

Out of the five collaborative activities between REALISE and ISSD, four were successfully implemented while the collaboration activity in Hawassa was dropped because of ISSD staff turnover. The collaboration in Haramaya on potato commodity focused on seed multiplication to support REALISE scaling effort in 2020. The bread wheat collaborative activities in Bahir Dar and Woldia focused on crowdsourcing for variety deployment and giving a basket of choices for farmers. In Mekelle two collaborative activities were implemented in malt barley and papaya with the objectives of strengthening value chain and pre-scaling respectively.

Table 14 REALISE collaborative activities

Cluster	Collaboration with	Places	Commodity	Focus	Status
HrU	ISSD	Jarso and Dadar	Potato	Seed multiplication	
HwU	ISSD	Halaba	Finger millet		Dropped
BDU	ISSD	Dabat	Bread wheat	Crowdsourcing	
WU	ISSD	Meket	Bread wheat	Crowdsourcing	
MU	ISSD, CASCAPE	Ofla, Endamekhoni and Alaje	Male barely	Value chain	
	CASCAPE	Alaje	Papaya	Pre-scaling	Training
	CASCAPE	Alaje and Ofla	Chickpea	Pre-scaling	

Stakeholders collaboration

The REALISE HwU cluster has been implementing its intervention in collaboration with diverse partners. At grass root level; the project collaborates kebele level administrations and DAs for targeting beneficiaries participating in different project activities. In addition, project collaborates with kebele level agricultural development agents in implementing FTC level experimentation as well as ensuring technical assistance for identified PSNP and Non PSNP farmers for on farm research in applying the improved technologies agronomic practices for validation, demonstration and or pre-scaling activities of the project.

The PMU collaborates with key stakeholders at national such as MoA, EIAR, ATA, PSNP Directorate, Extension Directorate, SNV etc. Joint collaborative activities are implemented with MoA, ATA and EIAR with the signing of MoU. The first MoU was signed between BENEFIT, EIAR and ATA to carryout fertilizer validation activities on four major crops (maize, sorghum, wheat and Teff) on ten woredas.

The second MoU is signed between MoA and BENEFIT to map soils of 18 woredas in four regional states of Ethiopia. REALISE collaborates with these institutions and participates in the activity implementation and financial support.

REALISE programme implementing University clusters on the other hand collaborates with stakeholders at regional, zonal, woreda and kebele levels. Depending on the context of the University clusters also collaborate with agricultural research institutes and centres, seed enterprises, MFI/RUSACO, farmers cooperatives and NGOs. REALISE conducted stakeholders' analysis and developed stakeholder management strategy for ensuring effective collaboration and partnership. The details of the stakeholder's engagement at REALISE programme level is presented below in Table 15.

Table 15 Stakeholders' collaboration at PMU and University clusters

University Cluster	Stakeholders Collaboration
PMU	Ministry of Agriculture, Ethiopian Institute of Agricultural Research, Agricultural Transformation Agency, PSNP directorate, Extension Directorate, Food and Nutrition coordination office ta MoA, SNV
AMU	Agricultural Research Centres (Areka, Awassa, Arba Minch), Zonal and Woreda agriculture offices, Oromia Seed Enterprise, Farmers Cooperatives, Kebele Administrations, NURU and SURU international NGOs
MU	Regional, Zonal and Woreda office of Agriculture, PSNP, OFARD, TARI, REST-GRAD II, MSHE, HELVETAS, ATA, SNV, Kebele Administrations
BDU	Regional, Zonal and Woreda office of Agriculture, PSNP, Kebele Administrations, FHI, Seqota Declaration, VITA, Amhara Seed Enterprise, ARARI, Cooperatives, Unions
AU	Zonal and Woreda Office of Agriculture, Kebele Administration, Agricultural Research Centres (Kulumsa, Melkasa), Oromia Seed Enterprise, Ethiopia Seed Enterprise, ORARI
HwU	Regional, Zonal and Woreda Office of Agriculture, PSNP, Kebele Administrations, SARI, Worea Marketing and Cooperative promotion agency
OBU	Zonal and Woreda Office of Agriculture, Kebele Administration, Agricultural Research Centres (Melkasa, Chiro), CARE, WVE, Cooperatives
HrU	Zonal and Woreda Office of Agriculture, Kebele Administrations, Agricultural Research Centres (Fudis, Chiro), Woreda Office of Health, RUSACO, Cooperatives
WU	Zonal and Woreda Office of Agriculture, Kebele Administrations, Agricultural Research Centres (Srinka), Woreda Office of Health, Amhara Seed Enterprise RUSACO, Cooperatives

Mainstreaming social inclusion & nutrition

In both collaborative partnership activities and stakeholder's collaboration the social inclusion focus is maintained. REALISE brings forward youth unemployment, gender and food insecure households causes into its programme operation.

Conclusions and recommendations

The overall achievement of the programme in 2019 can be rated as astonishing in terms of attaining reach targets, yield increment, best practice validation and pre-scaling of proven technologies and capacity development. The system innovation pillars designed to address systemic challenges and tries new way of doing things. We witnessed promising results from the system innovation lab in terms of piloting what works and learning what does not work.

Achievements

- M&E frame work which is aligned with BENEFIT M&E is prepared and operationalised;
- REALISE is able to collaborate with Agricultural research centres (federal as well as regional centres), seed enterprises, extension (from national to kebele levels), microfinance institutions, relevant NGOs and private sectors (input suppliers, cooperatives);
- A total of 68 best fit practices have been promoted in REALISE target woredas (ten were adapted from CASCAPE);
- BENEFIT Collaborative activities were designed and implemented with ISSD and CASCAPE on four products and eight places (woredas);
- Thematic collaboration was established with MoA on soil mapping and recommendation mapping;
- Taskforce was established to oversee the soil characterization and recommendation mapping;

-
- Thematic collaboration was established with MoA, EIAR and ATA on validation of recommendation;
 - Partnership was established with national, regional, zonal, woreda and kebele level stakeholders.

Challenges, opportunities and lessons learnt

Challenges

- The product and place definition of collaboration has a limitation to work with CASCAPE because the target woreda differs;
- Government officials are mostly unavailable for meetings and workshops to ensure proper communication;
- Rigid working procedure of government organizations to incorporate best fit practices into their mandates, which forces longer engagement to ensure mainstreaming of evidences;
- Work burden of development agents with routine activities at the peak agricultural seasons demands extra efforts of REALISE experts.

Opportunities

- Greater opportunity exists for layering and sequencing of REALISE activities with partner institutions and within BENEFIT partnership;
- The availability of soil mapping experiences within BENEFIT partnership and among partnering institutions;
- The GoE has given due emphasis to the soil sector;
- The BENEFIT partnership emphasis on collaborative activities.

Lessons learnt

- Capitalizing on CASCAPE progress on soil cauterization and recommendation mapping;
- Capacity on the state of the art demonstrated by ISRIC and CASCAPE on soil characterization has been adapted by REALISE;
- Adaptive programme management employed in operating risk prone and chronically food insecure areas of PSNP (e.g. discussing with partners on change of crops, variety types, dropping some planned activities when the context changed etc.);
- Memorandum of understanding is essential to clarify roles and responsibilities for partnership.

Way forward

- REALISE and ISSD do have more opportunity to collaborate to improve availability and access of quality seed for farmers preferred varieties;
- Joint activities of REALISE and MoA on soil mapping and Innovation recommendation mapping were started on 12 woredas but it requires institutionalization of the approach for scaling;
- REALISE plays a key role on the regionally established four platforms to institutionalize its early impacts and it will hand over its lead role to local actors in 2020;
- Capacity building on soil mapping and innovation recommendation mapping will be focused in 2020 for institutionalization with MoA and EIAR.



Appendix 8 List of abbreviations and acronyms

AACCSA	Addis Ababa Chamber of Commerce and Sectoral Associations
AAU	Addis Ababa University
ABSF	Agribusiness Support Facility
ABSF	Agribusiness Support Facility
ACC	Agricultural Commercialization Cluster
ACGG	African Chicken Genetic Gains
ACSI	Amhara Credit and Saving Institution
ADPLAC	Agricultural Development Partners Linkage Advisory Council
AGOA	African growth Opportunity Act 2019-2025
AGP	Agricultural Growth Program
Agriterra	Agri-agency established by Dutch farmers' organisations
ALEC	African Livestock Exhibition and Congress
ARARI	Amhara Regional Agricultural Research Institute
ARC	Agricultural Research Centre
Ardaita	Centre of Excellence for cooperative training in Ethiopia
ARI	Agricultural Research Institute
ASMA	Appropriate Solutions for Mechanization of Agriculture in Ethiopia
ATA	Agricultural Transformation Agency
B2B	Business to business
BDU	Bahir Dar University
BEAR II	Better Education for Africa's Rise
BENEFIT	Bilateral Ethio-Netherlands Effort for Food Security; Income and Trade
BFPM	Best fit Practice Manuals
BMGF	Bill & Melinda Gates Foundation
BoA	Bureau of Agriculture
C4C	Cooperatives for Change
CAADP	Comprehensive Africa Agriculture Development Program
CANAG	CASCAPE Nutrition and Gender project
CASCAPE	CApacity building for SCAaling up of evidence based Practices in agricultural production in Ethiopia
CBO	Cooperative Bank of Oromia
CBSP	Cooperative Based Seed Production
CDI	Centre for Development Innovation
CDSF	Capacity Development Support Facility
CGIAR	Consultative Group on International Agricultural Research
CIG	Common Interest Group
CoC	Certificate of Competence
CPA	Cooperative Promotion Agency
CPO	Cooperative Promotion Office
CS	Crowd Sourcing
CSA	Central Statistical Agency
D4A	Drivers for Adoption
DA	Development Agent
DBE	Development Bank of Ethiopia
DDS	Dietary Diversity Score
DECSI	Dedebit Credit and Savings Institution (Tigray)
DFID	Department for International Development
DGIS	Directorate General for International Cooperation
DLS	Diffused Light Storage
DSM	Direct Seed Marketing
ECI	Environmental Compliance Institute

ECTS	European Credit Transfer System
ECX	Ethiopian Commodity Exchange
EGS	Early Generation Seed
EIAR	Ethiopian Institute of Agricultural Research
EKN	Embassy of the Kingdom of the Netherlands
EMCWF	European Centre for Medium-Range Weather Forecasts
EMDIDI	Ethiopian Meat and Dairy Industry Development Institute
ENLBA	Ethiopia Netherlands Business Association
ENTAG	Ethiopia-Netherlands Trade for Agricultural Growth
EPPPA	Ethiopian Poultry Producer Processors Association
EPOSPEA	Ethiopian Pulses, Oilseeds and Spices Processors-Exporters Association
ERCA	Ethiopian Revenue and Customers Authority
ESA	Ethiopian Seed Association
ESAHGPA	Ethiopian Spice Aromatic and Herbs Growers and Processors Association
ESE	Ethiopian Seed Enterprise
ESRI	Ethiopian Soil Resource Institute
ETB	Ethiopian Birr
ETC	Ethiopian Telecom Cooperation
EthioSIS	Ethiopian Soil information system
ETM	Extension Training Materials
EVA	Ethiopian Veterinary Association
F&S Ethiopia	Fair and Sustainable Ethiopia
FBPIDI	Food, Beverage and Pharmaceutical Industry Development Institute
FCA	Federal Cooperative Agency
FDOV	Faciliteit Duurzaam Ondernemen en Voedselzekerheid (Facility for Sustainable Entrepreneurship and Food Security)
FGI	Fertile Grounds Initiative
FHH	Female Headed Household
FP	Farmers' Practices
FPC	Farmer Production Cluster
FSC	Farm Service Centre
FTC	Farmer Training Centre
GALS	Gender Action Learning System
GAP	Good Agricultural Practice
GARC	Gondar Agricultural Research Centre
GF	Guarantee Fund
GIC	Green Innovation Centre
GIZ	German Corporation for International Cooperation
GoE	Government of Ethiopia
GTP	Growth and Transformation Plan
ha	Hectare
HH	Household
HU	Haramaya University
HuARC	Humera Agricultural Research Centre
HwU	Hawassa University
IAIP	Integrated Agro-Industrial Park
IATI	International Aid Transparency Initiative
ICT	Information and Communication Technology
IF	Investor farmer
IFDC	International Fertilizer Development Centre
IFDC/2SCALE	Agribusiness development project '2SCALE' of IFDC
IFPRI	International Food Policy Research Institute
IICD	International Institution for Communications and Development
ILRI	International Livestock Research Institute
IML	Informal Money Lenders
IPD	Import Promotion Desk
IPM	Integrated Pest Management

IRM	Innovative Recommendation Mapping
ISFM	Integrated Soil Fertility Management
ISRIC	International Soil Reference and Information Centre
ISSD	Integrated Seed Sector Development in Ethiopia
IT	Innovation Teams
ITA	Italy Trade Agency
ITT	Indicator Tracking Table
ITVP	Integrated Technology Validation Protocol
JU	Jimma University
KAEP	Kebele Agro-Economic Planning
Kaza	Kaza Capital Goods Lease Financing PLC
KB	Kennis Basis (Knowledge Base)
KIT	Royal Tropical Institute
KPI	Key Performance Indicator
LIFT	Land Investment for Transformation
LSB	Local Seed Business
M&E	Monitoring and Evaluation
MARC	Melkassa Agricultural Research Centre
MASP	Multi-Annual Strategic Plan
MFI	Micro Finance Institute
MHH	Male Headed Household
MoA	Ministry of Agriculture
MoH	Ministry of Health
MoI	Ministry of Industry
MPC	Multi-purpose Cooperative
MRR	Marginal Rate of Return
MRY	Marginal Rate of Yield
MSC	Most Significant Change
MU	Mekelle University
NABC	Netherlands Africa Business Council
NAHDIC	National Animal Health Diagnostic and Investigation Centre
NARS	National Agricultural Research System
NBE	National Bank of Ethiopia
NGO	Non-Governmental Organization
NMA	National Meteorological Agency
NPMU	National Program Management Unit
NRM	Natural Resource Management
NVI	National Veterinary Institute
OAIRA	Oromia Agricultural Input Regulatory Authority
OSE	Oromia Seed Enterprise
P2P	Peer to Peer
PC	Primary Cooperative
PCU	Portfolio Coordination Unit
PED	Pre-Extension Demonstration
PED	Pre-Extension Demonstration
PGR	Plant Genetic Resources
PICS	Purdue Improved Crop Storage
PIM	Project Implementation Manual
PMEC System	Planning, Monitoring, Evaluation and Communication System
PMU	Project Management Unit
PPP	Public Private Partnership
PPP-O	Public Private Partnership on Oilseeds
PRA	Participatory Rural Appraisal
PSA	Private Sector Association
PSE	Public Seed Enterprises
PSNP	Productive Safety Net Programme
PSP	Private Seed Producers

PVS	Participatory Variety Selection
RAB	Rwanda Agriculture Board
RARI	Regional Agricultural Research Institute
RCI	Rwanda Cooperation Initiative
RCPA	Regional Cooperative Promotion Agency
RED&FS	Rural Economic Development & Food Security committee
RIAS	RABO International Advisory Services
RSE	Regional Seed Enterprise
RUSACCO	Rural Savings And Credit Cooperative Organization
RVO	Netherlands Enterprise Agency
SACCO	Savings And Credit Cooperative Organization
SARC	Sirinka Agricultural Research Centre
SBC	Sesame Business Cluster
SBN	Sesame Business Network
SH / SHF	Small Holder / Smallholder Farmer
SITA	Supporting Indian Trade and Investment for Africa
SLLC	Second Level Land Certification
SMEs	Small and Medium Enterprises
SMS	Subject Matter Specialists
SNNP	Southern Nations Nationalities and People
SNNPR	Southern Nations Nationalities and Peoples Region
SNV	Netherlands Development Organisation
SNV	Netherlands Development Organisation
SPC	Seed Producer Cooperative
SSAP	Supporting Sustainable Agricultural Productivity
SVC	Seed Value Chain
t	metric ton
TA	Technical Assistance
TAG	Ethiopia-Netherlands Trade for Agricultural Growth
TARI	Tigray Agricultural Research Institute
TC	Technical Committee
TGT	Tebebe General Trading
TLST	Time and Labour-Saving Technologies
TNSRC	Tepi National Spices Research Centre
ToC	Theory of Change
ToT	Training of Trainers
UAE	United Arab Emirates
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
USD	United States Dollar
VC	Value Chain
VDAFACA	Veterinary Drug and Animal Feed Administration and Control Authority
Walya	Walya Capital Goods Lease Financing PLC
WCDI	Wageningen Centre for Development Innovation, Wageningen University & Research
WCPO	Woreda Cooperative Promotion Office
WHO	World Health Organisation
WOA	Woreda Office of Agriculture
WUR	Wageningen University & Research
ZOA	International relief and recovery organization
ZoDA	Zonal Department of Agriculture



Wageningen Centre for Development
Innovation
Wageningen University & Research
P.O. Box 88
6700 AB Wageningen
The Netherlands
T +31 (0)317 48 68 00
www.wur.eu/cdi

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Wageningen Centre for Development Innovation supports value creation by strengthening capacities for sustainable development. As the international expertise and capacity building institute of Wageningen University & Research we bring knowledge into action, with the aim to explore the potential of nature to improve the quality of life. With approximately 30 locations, 5,000 members of staff and 12,000 students, Wageningen University & Research is a world leader in its domain. An integral way of working, and cooperation between the exact sciences and the technological and social disciplines are key to its approach.



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Wageningen Centre for Development Innovation
Wageningen University & Research
P.O. Box 88
6700 AB Wageningen
The Netherlands
T +31 (0)317 48 68 00
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