



# BENEFIT-REALISE STORIES OF CHANGE



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## Contents

ACRONYMS .....	i
About BENEFIT-REALISE .....	1
Program Goal.....	1
BENEFIT-REALISE Innovation Pathways .....	1
Ex-ante Context.....	2
Crop Productivity for Bridging Food Gap Months.....	3
Wheat Technology to Improve Food Security of PSNP Households .....	4
Double Benefits of Improved Maize Variety for Poor PSNP Farmers.....	1
Pre-scaling of Improved Hybrid Maize Variety for Food and Nutrition Security .....	3
Improved Maize Variety with a Potential to Reduce Food Gap Months .....	5
Improved Onion Technology for Food Security and Asset Building: A Game Changing Intervention.....	7
One 'Timad' Potato Package: A Proven Context Specific Approach for PSNP Households .....	9
Improved Faba bean Technology towards Food Security, Income Generation and Asset Building.....	11
Nutrition Sensitive Agriculture .....	13
Parma Garden Production: Improving Food and Nutrition Security .....	14
High Yielding and Early Maturing Sweet Potato Variety Improving Food Security of Poor Households.....	16
Sweet Potato: A Means to Food and Nutrition Security and Livelihood Diversification .....	18
Orange Fleshed Sweet Potato Contributing to Food Security and Nutrition.....	20
Improved Potato variety for Food Self-sufficiency, Improved Nutrition and Income Generation .....	21
Crop Diversification as a means of Risk Aversion .....	23
Papaya Pre-scaling for Improved Nutrition and Income.....	25
Maradol Papaya Demonstration Improvs the Diet Quality of Poor Households .....	26
Support to Women and Youth .....	28
Improved Potato Variety Resulting in Livelihood Diversification of Poor Women Farmers.....	29
Youth Learning New Ways to Escape Unemployment.....	31
Improved Chicken Breed for Income and Diversified Diet for PSNP Women.....	33
Building the Resilience of Women through Small Ruminant Fattening .....	35
Dairy Goats Improving Livelihoods .....	36
Environmental Sustainability .....	37
Vermicompost Demonstration: Reduce Fertilizer Cost, Increase Soil Fertility and Crop Productivity .....	38
Intercropping Economical, Nutritional and Environmental benefit .....	40

## ACRONYMS

BENEFIT	Bilateral Ethiopia-Netherlands Effort for Food Security, Income and Trade
CASCAPE	Capacity building for Scaling up of evidence-based best Practices in Agricultural Production in Ethiopia
CSA	Central Statistical Agency
DA	Development Agents
DDS	Dietary Diversity Score
FHH	Female Headed Household
GoE	Government of Ethiopia
Ha	Hectare
HDDS	Household Diet Diversity Score
HHS	Household Heads
MOA	Ministry of Agriculture
MHH	Male Headed Household
PSNP	Productive Safety Net Programme
PRA	Participatory Rural Appraisal (PRA)
REALISE	Realising Sustainable Agricultural Livelihood Security in Ethiopia
SMS	Subject Matter Specialists
SNNPR	Southern Nations Nationalities and Peoples Region
ToTs	Training of Trainers

## About BENEFIT-REALISE

The 'Realising Sustainable Agricultural Livelihood Security in Ethiopia' (BENEFIT-REALISE) programme is established in 2018 with the aim to contribute to sustainable livelihoods through the introduction of improved farming practices, innovations and social experiments to strengthen the Productive Safety Net Programme (PSNP IV) in Ethiopia. BENEFIT-REALISE is operational in four regional states namely Amhara, Oromia, SNNP and Tigray covering 60 woredas with an implementing period of three years (2018-2020). It is funded by the Directorate-General for International Cooperation (DGIS) of the Netherlands Ministry of Foreign Affairs. and is implemented by eight university clusters (Arba Minch, Arsi, Bahir Dar, Haramaya, Hawassa, Mekelle, Oda Bultum and Woldia) with the support from Wageningen University and Research (WUR).

## Program Goal

"Enhanced human, organizational and institutional capacities to adapt, validate and scale Best Fit Practices (BFPs) to improve the resilience of chronically food insecure households in PSNP woredas."

## BENEFIT-REALISE Innovation Pathways

The BENEFIT-REALISE innovation pathway captures the process to select, validate and scale BFPs. The entry point for BENEFIT-REALISE interventions was a bottom-up planning with active participation of chronically food insecure households in the target communities and other key stakeholders. Based on identified problems and opportunities as perceived by PSNP households and local stakeholders themselves, context specific BFPs were identified and designed to address these problems.

A process of matching the existing innovation with the key priorities were made. If no existing BFP can be found, new solutions were designed and tested. Participatory validations and demonstration approaches were followed so that farmers are encouraged to try out new things in a safe learning environment under on-farm conditions. For those

BFPs and solutions that are successful, BENEFIT-REALISE programme promotes pre-scaling and provides scaling support (together with the Ethiopian government and its public and private partners) to ensure that other areas and partners can benefit from these locally grounded evidences.

BENEFIT-REALISE paid special attention to capacity building, where Training of Trainers (ToTs) and in-situ trainings were given to farmers, development agents (DAs) and Subject Matter Specialists (SMS). In addition, well-coordinated support and technical back-stopping to local stakeholders who are responsible for scaling of successful agricultural innovations were given.

This 'Stories of Change' booklet is prepared to show local level evidence of successes of the BENEFIT-REALISE programme interventions over the last two years.

Even though some of the stories of change apply across all thematic areas, we have tried to group the stories into the following four thematic areas.

- I. **Crop productivity and bridging food gap months:** Interventions that focus on increasing crop production and productivity through increased availability, timely delivery and use of validated best fit practices.
- II. **Nutrition-sensitive agriculture for enhanced diet diversity:** Initiatives that specifically address the underlying causes of malnutrition. Production of crops and vegetables that are affordable, nutritious, culturally appropriate and safe in adequate quantity and quality to meet the dietary needs in a sustainable manner.
- III. **Social inclusion and resilience building:** Interventions designed to improve the livelihood of excluded sections of society, specifically women and youth.
- IV. **Environmental sustainability:** Interventions that focus on introducing eco-friendly and cost-effective technologies for increased agricultural productivity.

## Ex-ante Context

In order to help the reader to grasp the pre-intervention context, the main findings of the baseline survey are summarized as follows.

In BENEFIT-REALISE target areas, sorghum is reported as the most important crop in over 27.8% of the cases. Maize is the second most frequently reported crop (26.9%) followed by Wheat (17.6%). The productivity assessment during the baseline shows that the prevailing productivity level of Productive safety net programme (PSNP) beneficiary households for major crops is much lower (a third) as compared to the national average and of Non-PSNP counterparts. The reported yield in quintal per hectare (qt/ha) based on the area cultivated for the respective crops for PSNP households indicate 8.79 (sorghum), 7.59 (Maize), 11.64 (wheat), and 4.63 (*Teff*) and respectively. The level of improved agricultural inputs used such as fertilizers, improved seed, agronomic practices and chemicals are low.

The seed portfolio is limited to 13 crops with a unique number of 45 quality seed varieties. Cereal crops (6) have relatively better variety options followed by vegetables (4). Maize and wheat have relatively higher variety options with 14 and 11 different varieties respectively. On the other hand, there are almost no variety option for Sorghum. The most commonly reported seed sources include informal seed producer groups (43.5%) followed by the Local market (32% and 26.3%) and cooperatives (18 %) respectively. Moreover, a considerable number of farmers (47%) cultivating cereals use farm saved seed.

The mean number of food gap months were around 3.14, and Female headed households experience higher food gap months (3.24) than Male headed households (3.00). Food shortage is intensified in, June, July, August and September where more than 50% of the population is challenged to get enough food. Region wise, the food gap months were high in SNNP (4.05) and Oromia (3.62), moderate in Tigray (3.22) and low in Amhara (2.03). Among PSNP HHs the food gap months were found higher for all regions with mean value of 4.16.

The mean household dietary diversity score (HDDS) for PSNP HHs was 4.56 implying poor household level nutrition. Looking at the distribution in tercile (low, medium and High) of HDDS proportion among HHs, PSNP beneficiaries' score is low in contrast with Non-PSNP. (Low - category 27% and 16% PSNP and non-PSNP beneficiaries and high-category 13% for PSNP and 24% for Non-PSNP HHs respectively). There is not much difference in HDDS score for MHHs and FHHs.

The asset holding position of the households are low with an average 1.95 tropical livestock unit (TLU), 1.82 rooms, 0.87 hoe, 0.62 ox plough and 1 sickle. The asset holding of FHHs is much lower than that of MHHs. In terms of the asset index, the overall asset index of the respondents was 1.97. Non-PSNP household's asset index is 2.2, better in comparison with their PSNP counterparts (1.72).

Multiple hazards were reported by the households where drought, flood and pests and diseases are the top three ones. In order to reverse the adverse effect of the hazard, the majority of HHs (70%) tend to follow passive coping strategies such as selling livestock and seed, borrowing for consumption smoothening, begging, remittance and selling or exchanging productive assets. The proactive coping strategies such as crop diversification, use of better performing varieties, natural resource conservation, intensification and water harvesting are not widely practiced.

The baseline findings indicate that Female headed HHs share out land more than male headed HHs, and male headed HHs share in more land than they share out. This difference in sharing in/ out land can be explained by the difference in access to farm labour, cultural division of labour in agriculture, access to extension services, access to credit and financial services, etc.

The baseline results show that access to institutional support such as s extension services, access to credit and training are inadequate to PSNP and female headed households compared to Non-PSNP households.



*Intercropping of maize and bean at early growth stage*

## **Crop Productivity for Bridging Food Gap Months**

The BENEFIT-REALISE programme engages in the validation, demonstration and pre-scaling of agricultural technologies and practices (so-called best-fit practices) that have the potential to increase agricultural production and productivity. The programme works to identify and validate improved practices that fit the context of PSNP clients who are chronically food insecure and responds to their needs for meaningful contribution to agricultural production and productivity and improvement of their food security thereby reducing households' food gap and increasing their resilience.

Best practices identified by different programmes, NGOs and agricultural research systems in different biophysical and socio-economic settings are available to address productivity constraints. These technologies will be matched with the

conditions of PSNP and validated for local adaptation. Matching refers to finding a suitability to agro-ecologies and the perceived needs of diverse groups (such as women, men, young and elder farmers) and available practices for validation.

BENEFIT-REALISE works on problems that farmers want to address, in the role they play as livelihood provider and entrepreneur. The proven results are discussed to motivate and encourage farmers to try out new practices, promoting farmers' ownership by testing and adjusting farming practices. In this process, farmers can see, feel and experience the results of the tested management practices.

The validated best practices are demonstrated to farmers under their own situations. Pre-scaling is conducted to document processes on scalability to be incorporated to the scaling strategy.



## Wheat Technology to Improve Food Security of PSNP Households

### The Context

A Participatory Rural Appraisal (PRA) conducted by BENEFIT-REALISE Arsi University cluster in 2018, shows that wheat and maize are the major food crops produced by Productive Safety Net Programme (PSNP) farmers in the project targeted woredas in Arsi Zone. Due to limited access to improved production technology and rainfall variability, the farming community faces frequent crop failure and a pronounced yield gap.

### The Intervention

With the primary goal of increasing crop productivity and contributing to food security of these PSNP households one of BENEFIT-REALISE Arsi University cluster intervention in 2019 focused on demonstration of two improved wheat varieties (Ogolcho and Kingbird), in food insecure households in three kebeles of Sire, Dodota Ziway Dugda and Nagelle Arsi woredas. In 2020, these improved wheat technologies were pre-scaled, reaching a larger number of beneficiaries in the demonstrated area and two additional kebeles from Sire and Nagelle Arsi woredas.

In 2019, the project provided improved seed, fertilizer and training on best fit agronomic practices, reaching 49 households (30% Female farmers and 80% PSNP) for demonstration. In 2020, a total of 600 farmers (30% Female farmers and 80% PSNP) were engaged in pre-scaling activity, where the project provided only seed and the farmers covered the cost of fertilizer needed.

### The Change Cases

Sultan Jarra lives in Lode Hada Village, Dodota Alem Kebele of Dodota Woreda, Arsi Zone. He is a father of eight children and has been a PSNP beneficiary since 2013. On his one hectare of farm land, he usually grows crops like wheat, onion, barley, maize, and *teff* to feed his family.

Sultan Jarra said, "In 2019, I heard from BENEFIT-REALISE staff and the kebele DAs that I was selected to participate in a wheat demonstration trial of two improved wheat varieties. They gave us 37.5kgs of Kingbird seed to sow on 0.25ha of land, 25kg of NPS and 25kgs of Urea for each of the varieties. We were trained on land preparation, fertilizer and seed application as well as row planting.

Based on what I have learned, I ploughed and tilled my plot five times and planted the seed on rows. I also applied the recommended fertilizer rate. The biggest challenge I faced was shortage of labour. so I used manually pulled bulks of thrones over the soil (traditionally used technique) for the row planting. Even though most of us understand the value of row planting, and have seen the result, I am afraid we will go back to the traditional method of broadcasting, unless we get a row planter to simplify the process.

Based on the advice of the experts, I also planted traditional seed on a separate 0.25ha plot using traditional practice, for further comparison.

With very good rainfall from the beginning of the cropping season, I harvested 9 quintals of Kingbird variety, while I harvested only 3 quintals from the plot where I used traditional seed and method.

Getting higher yield means I've already secured access to improved wheat seed variety for the coming year available in my home. I sold part of the harvest and bought an ox to use as a source of draught power, fertilizer, and clothes for my children.



This year, I witnessed many farmers have started growing the improved wheat variety applying improved practices. Some of these farmers have obtained the seed and learned the new practices from me – like my relative Mustefa.” said Sultan.



Mustefa Hajidawo, a relative of Sultan who lives in the same area told us a similar story. “I have been a member of PSNP since 2005. But PSNP support is limited to proving us with cash or grain for public work participation, and not much on how to improve our farming practices.”

Mustefa added, “Although I heard about row planting during kebele meetings and training before, I saw it in practice only after visiting Sultan’s farm last year. From the DA’s and Sultan’s experience I’m also convinced that the kingbird variety is fast growing, early maturing, and high yielding variety. Hence, I plan to apply the improved package and share what I have learned with other relatives and farmers who live in the nearby villages.”

When experts were asked how they view the success of the project, they said, “The benefit of the improved variety and use of new agricultural

practice can be seen in the yield difference that was achieved. But getting access to small machineries, specifically for labor intensive and time-consuming activities such as row planting is critical. Also, an emerging pest problem, in particular rust disease that requires more frequent pesticide spraying that is unaffordable for PSNP farmers, is a challenge, affecting the productivity of the crop, thereby jeopardizing efforts towards food self-sufficiency.”

## Double Benefits of Improved Maize Variety for Poor PSNP Farmers



### The Context

A Participatory Rural Appraisal (PRA) conducted by BENEFIT-REALISE Arsi University cluster in 2018, in the project woredas (Adami Tullu Jiddo Kombolcha, Nagelle Arsi, and Ziway Dugda) shows that maize is among the major crops produced by the community. However, the maize grown in the areas are conventional maize varieties, and that farmers haven't yet benefited from Quality Protein Maize (QPM).

### The Intervention

In 2020, with an objective to improve the livelihood of marginalized Productive Safety Net Programme (PSNP) farmers and support those who cannot afford to buy or get access to improved seed varieties, BENEFIT-REALISE Arsi University cluster implemented QPM pre-scaling intervention in Ziway Dugda, ATJK and Nagelle Arsi woredas. QPM was selected to tackle and bridge prevailing months of food gap (early maturing) in the areas and also increases household diet diversity.

The project introduced a new maize variety called Melkassa-6 QPM, reaching 300 farmers (210 men and 90 women / 240 PSNP and 60 non-PSNP) in three Kebeles. The pre-scaling phase was undertaken considering the success and lessons learned from the best performances of other Melkasa series pre-scaled in the areas by the project during the previous cropping season.

The project worked with Oromia Seed Enterprise (Dodola station) to access the QPM seed. The office of agriculture and natural resources at various levels (kebeles, woredas, and zonal offices), and the Oromia Seed Enterprise were key partners throughout the implementation process.



## The Change Cases

Hussein Gamachu was one of the farmers selected in QPM pre-scaling intervention.

"My name is Hussien Gamachu, born and raised in Golbe Kebele, Ziway Dugda Woreda, Arsi Zone. I have been married for 16 years, and we have seven children – two sons and five daughters.

My family livelihood depends on agriculture. I produce different crops on one hectare of land I inherited from my parents. Even though meeting the needs of my family has always been difficult, it has gotten worse since my wife suffers from a severe heart problem, and her health deteriorated in the last few years. Things were getting so bad, some of my children had to drop-out of school to help out around the house. For the last 6 years, I barely managed to survive with support from the PSNP programme through direct provision of either cash or food grains.

In 2020, I was selected to participate in a BENEFIT-REALISE project that introduced a new improved maize variety. BENEFIT-REALISE Arsi University cluster experts together with the Development Agents (DAs) of our kebele gave us 6.25kgs of the improved maize seed variety to 100 farmers. They also trained us on how to prepare our land, apply seed rates, row planting and weeding. We were told that the maize variety introduced is very valuable in terms of its protein content and its relevance to our health, especially for children and pregnant or lactating women.

I prepared my 0.25ha of land and planted the seed according to the recommendations given by the experts. Preparing the land was challenging, since there was a serious shortage of draught power at the beginning of the season. I don't have an ox, and had to wait and borrow from others in the surrounding area. Row planting was also labour intensive and time consuming. In addition, we faced erratic rainfall for most of the farming season.

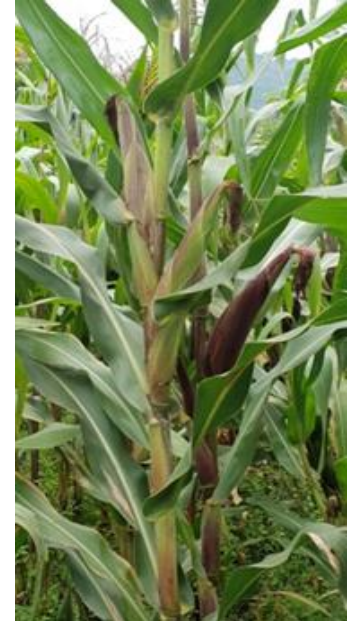
But in spite of these problems, the crop was able to mature early. We were happy to see the size of the grain on each cob that is bigger than other local varieties, which meant better yield. Most farmers got an average of 14 quintals from 0.25ha of land we used to plant the variety. Realizing its value in terms of productivity and nutrition, we have decided to save some of the seed for next season, sell some and even give a small portion to those who cannot afford to buy them.

As far as consumption, my family, especially my children, have enjoyed it starting at its early green stage (*eshet*). The children love the taste and my wife who is now pregnant is also consuming it often because of its nutritional value.

It is only with the BENEFIT-REALISE project that we started engaging in a productive farming activity. Thanks to the project, we are feeding our family sufficiently and able to use the grain during the months of food gap. This year, there is a food deficit in the area because of the erratic rainfall, and many farmers had to buy maize and other food grains from the market while those who cannot afford to buy were literally starving. You can imagine how hard it would have been for us, if it was not for these varieties with short maturity periods, and the support of the project." said Hussein.



Hussien's wife, Zeyneba Bedaso said, "I am very happy we participated in this project. This time of the year has always been hard and we would have been struggling to feed our family like many households are going through right now. But this maize was amazing. Not only are we eating and getting the protein our body needs we were also able to save our assets which otherwise would have been sold to get income to buy other food items."



## Pre-scaling of Improved Hybrid Maize Variety for Food and Nutrition Security

### The Context

Bona woreda, is like other PSNP woredas, characterized by food and nutrition insecurity in the Southern Nations, Nationalities and Peoples Region (SNNPR) and Sidama region. Maize is one of the staple crops in the woreda. Baseline survey conducted by BENEFIT-REALISE Hawassa University cluster in 2017 showed an average maize yield of 15.4q/ha for the PSNP woredas, far below the regional average maize yield (38q/ha) (CSA, 2018). The low productivity is mainly attributed to weak agricultural extension service and short supply of quality seeds that are suitable to the agro-ecologies. The problem is more pronounced for the PSNP households due to their low resource endowment, such as small land holding and lack of capital to buy agricultural inputs, and unfavorable climatic and soil conditions. Most of the farmers use local varieties and traditional farming practices with low productivity.

### The Intervention

With the knowledge that improved maize variety with better agronomic practices can produce 80-120 quintals per hectare in the mid-highland (Woyna dega) areas (EIAR, 2014), BENEFIT-REALISE Hawassa University cluster started pre-scaling of hybrid maize, BH 661 variety, engaging 150 farmers in three kebeles of Bona Zuria woreda

of Sidama region. The activity started based on the variety proven performance in the neighboring Malga woreda (BENEFIT-CASCADE experience), which has similar agro-ecological and socioeconomic settings.

The hybrid maize variety, BH 661, is suitable for mid highlands producing 65-85 q/ha on farmers' fields (EIAR, 2014). Farmers were selected by development agents and the kebele administration in consultation with the woreda office of agriculture who were involved throughout the intervention. Training on maize best fit practice was given to development agents and farmers by the project experts. Seed was provided by the project through cooperative union in the form of a revolving fund. The BENEFIT-REALISE Hawassa University cluster team, directly and/or through the woreda focal person and Kebele DAs, regularly monitored progress of the pre-scaling activities and gave technical support whenever necessary.

At the end of the pre-scaling activity, the cluster collected grain yield data from randomly selected 24 participating farmers, and recorded an average of 78.4q/ha (9.8 quintals of maize from 0.125ha of the pre-scaling). This showed 106% increase over SNNP regional average of maize yield and 409% yield increase over the baseline average maize yield. A field day was organized to let farmers and other stakeholders assess the variety performance which led to high interests to use the variety in the surrounding areas.

The following story of Mulu Kentere is a good example of how the improved maize seed and improved agronomic practice can improve the food and nutrition security of poor households.

## The Change Cases

Mulu Kentere, 38, is a female farmer in Melgano kolisho kebele of Bona zuria woreda with six family members. She is a PSNP beneficiary, who was struggling to raise six orphan children of her sister who lost both their parents a few years ago. In addition to what she gets from PSNP, Mulu works as daily labor, conducts small petty trading and sells local food in her village to make ends meet.

Mulu said, "I was among the 150 farmers who were selected to participate in Maize BH-661 pre-scaling activity. I was given 3.125kg of maize BH 661 variety, and was trained on agronomic practices of the crop. The field practices such as row planting and spacing, and method of fertilizer application is new to me and many farmers in our village. With close support from the project and government experts, I prepared my land by ploughing it three times, applied 2.5kg NPS and 25kg of urea fertilizer, and took other management practices.

From 0.125ha I was able to get 11 quintals of maize. Each maize plant carried an average of two big cobs and the yield was very high when compared to the local variety. I used to get about 5 quintals of maize from the same plot. From the produce, I used three quintals of maize for home consumption and sold the remaining 8 quintals for Birr 8,000.00. With the money, I bought a heifer. My plan is to get sustainable income from selling the cow's milk, and buy necessary utilities for the family. I would also like to continue engaging in production of the new variety maize, applying what I have learned. Now, I know how to increase productivity of maize from my small plot by using improved seeds and applying appropriate methods. I also plan to teach others to do the same".

Other farmers registered similar achievements. The practice demonstrated there are existing opportunities to improve food security of small-holder farmers and enable them to graduate from PSNP handouts.





## Improved Maize Variety with a Potential to Reduce Food Gap Months

*Jemal and his wife harvested Melkassa-2 field relay cropped with chickpea*

### The Context

A Participatory Rural Appraisal (PRA) conducted by BENEFIT-REALISE Haramaya University (HU) cluster in 2018 shows that Productive Safety Net Program (PSNP) supported households in East Hararghe Zone face an average of 3.66 months of food gap in a year. The study showed lack of improved crop varieties that fit the area, recurrent drought and moisture stress, and striga weed infestation as main contributing factors affecting the production and productivity of crops. Farmers in the area use late maturing local crop varieties (mainly sorghum), exposed to terminal moisture stress and increase crop failure probability.

### The Intervention

Based on the priority constraints identified, BENEFIT-REALISE Haramaya University cluster interventions in the area focused on validation and demonstration of improved varieties of major crops such as sorghum, maize, common bean, potato, sweet potato, groundnut, wheat, and various vegetables. High yielding, early maturing, and pest resistant crop varieties that also fulfill overall farmers' preference criteria were identified for scaling. Melkassa-2 maize variety was one such crop variety recommended for scale up in drought prone lowland to midland areas of east Hararghe.

Melkassa-2 is an open pollinated early maturing maize variety with high yield potential that was released from Melkassa Agricultural Research Center in 2004 for moisture stress areas. It is also suitable for a double cropping system due to its short maturity period. But despite its suitability its dissemination to the needy farming communities has been very low, due to various socioeconomic, structural, and infrastructural limitations. Especially to PSNP communities situated far from the research centers and those who live in less accessible remote kebeles.

In the 2019 and 2020 cropping season, the programme selected 448 farmers (30% female farmers), covering 29ha of land, from 14 kebeles of six districts, to test Melkassa-2, in comparison with their existing local cropping system. The selection was conducted with active involvement of the woreda agriculture offices, kebele administration and the community using pre-identified selection criteria such as PSNP membership, availability of land, gender and interest.

The following two stories are good examples that show the high level of farmers' acceptance of the newly introduced (Melkassa-2) maize variety and its performance.

## The Change Cases

Jemal Ahmed Umar, a 39-year-old father of three children living in Gologanjo village, Doroba 03 kebele of Gurawa district said, "My wife and I own a small piece of land we use to grow different crops such as sorghum, maize and common bean. We never used to get much from the local variety of maize since there is always a shortage of rain and it takes a long time to mature. Adding to that the problem of striga infestation minimized what we get from the crop. So I was excited to try the improved maize variety Melkassa-2."

When explaining the difference between the two varieties Jemal said, "From a piece of land allocated to maize, I used to harvest a maximum of one quintal (100kg) of maize from a local variety. But, growing Melkassa-2 on the same piece of land, I harvested three quintals (300kg). One quintal will feed my family for a little over one month. The yield I obtained from the new variety now can feed my family for four months. My wife also likes the quality and says it is very good for porridge and traditional *biden/injera*".



Another farmer named Suleyman Usman, a 70-year-old farmer, when asked about the newly introduced Melkassa-2 maize variety, he said, "I have been a farmer all my life and the only variety we know is "fayoo" which we cultivated for years. It is a late maturing local sorghum variety that takes more than seven months to harvest during which most families are exposed to food shortage. Which means most families need to find other means to feed their family, selling their assets to buy grain from nearby markets. But now the project brought us this marvelous variety which is planted in April and ready for consumption during the critical time of food shortage, around July to August. Now it is up to us to use it wisely to avoid our previous situation."

Suleyman added, "Those who are not growing Mekassa-2 are selling their asset to buy grain, and

many of my relatives and neighbors are asking if they can borrow the maize grain as a loan to pay it back in the form of sorghum grain when they harvest theirs late in December. I kept 50 best cobs of Melkassa-2 variety as a seed for next season planting and plan to plant it on a bigger land in the 2021 cropping season."

Several other farmers who participated in the intervention have similar stores, and gave their feedback during field days. They also confirmed that variety is successfully used as a preceding crop for chickpea relay cropping; thus, enabling farmers to harvest two crops in a season from the same piece of land, which is of paramount significance in areas where small land size per household is among the critical constraints. There is also a possibility of harvesting three crops in a season from the same piece of land when early maturing common bean is intercropped with Melkassa-2 maize variety, which is then relay cropped with chickpea.



## Improved Onion Technology for Food Security and Asset Building: A Game Changing Intervention

*Kedir Turcho (middle) wife Kerima Shifara and their son*

### The Context

Doba woreda in West Hararghe zone is a food insecure woreda, where resource poor farmers are supported by the government flagship social protection programme (Productive Safety Net Programme (PSNP)). In this area, most farmers face constraints related to access to resources and improved technologies. Farming households face shortage of improved seed, shortage of farmland, oxen for ploughing and capital. Additionally, the prevalence of erratic rainfall, a knowledge gap and limited access to market were identified by farmers as the major bottlenecks of agricultural production and productivity.

### The Intervention

With the objective of improving food security, increasing income and improving nutrition security of households, the BENEFIT-REALISE Oda Bultum University cluster started introducing and demonstrating improved onion technologies in 2018/19. Three improved varieties of onion (Adama Red, Bombe Red and Red King) were demonstrated on the fields of 25 farmers with access to small scale irrigation.

The demonstration identified Adama Red to be the preferred variety by farmers, which led to pre-scaling the variety in Doba woreda. In this pre-scaling stage 50 (30 Male, 20 Female) farmers were involved in 2020. The project allocated 20,000birr and purchased 12.5kg seed of Adama red variety from Chercher Oda Bultum Union (1,600birr/kg). 250grams of Adama red improved onion seed was provided to individual farmers for pre-scaling, with an agreement to return the cost of seed in cash for the primary cooperative at kebele level, as a revolving fund for seed purchase for further scaling by other farmers. The project agronomist provided in-situ training for the selected farmers before cropping. Additionally, advisory services to farmers and development agents on disease management, frequency of irrigation, weed management and marketing of the product were given by the project team.

Throughout the implementation period, regular field visits were conducted to assess the status of the crops up to harvest time. The project worked in close collaboration with zonal and woreda agriculture offices to ensure sustainability and continuation of the best practices for further scaling in the area.

## The Change Cases

The improvement in the livelihoods of the 75 farmers involved in the improved onion technology production initiative since 2018 is highly visible. The following two stories of change were extracted from interviews obtained from two farmers.

Kedir Turcho and his wife Kerima Shifara have a household of 7 family members, two of their children are students. They depended on PSNP support, to bridge a six consecutive months food gap they faced each year. They used to get about 1900 birr per month. Most years they survived by renting and borrowing necessities like land, oxen and capital for farm inputs.

Kidir said, "Since we started the BENEFIT-REALISE onion technologies trials that used best fit practices in onion production, my family earned an income of 32,000 Birr from the onions production sold in 2019. I used the money to buy food grains, paid for the children's schooling, bought farm inputs for next season production, and bought one ox, one heifer and nine chickens.

Following the success of the previous year, in the 2019/20 production year, I planted the improved variety on 0.0625ha and harvested 15 *gonfa* (1 *gonfa* is equivalent to 120kg) and got about 34,000Birr from sale. This time I bought five goats and one additional ox and one heifer.

Before the project intervention started, I used to take credit during summer seasons to buy grains to feed my family. Now, not only are we food secure year-round, we are able to meet all the necessities including education and clothing for our family, due to our increase in financial capacities. Because of the confidence I developed, I have started to engage in community social activities. I am very thankful for the project that opened the door for me to improve my livelihood in such a short time."

Kedir Turcho and his family who owned only one heifer before the project intervention are now

endowed with additional two oxen, one dairy cow, two heifers, five goats and nine chickens.

Amayu Kasim, a 60-year-old farmer, has a similar story. In the past, he said, "I relied on PSNP support and income working as day-labourer to feed my family of six. Before I joined the BENEFIT-REALISE intervention, my family did not own any livestock and we had to work for other farmers to earn enough money to rent ploughing oxen to use on our land. In just two years, my livelihood has improved significantly.

In the 2018/2019 cropping season, the project supported me with onion seed which I planted on half a *timad* of land (0.0625ha). I was able to get about 15000birr income from the sales of my harvest. In 2019/20, I planted improved Adama Red variety again and got an income of 18,400birr from the second-year sale. Currently I am capable of feeding my family year-round without fear. I bought one bull from the income of the first-year. That bull is now an ox. I additionally bought one heifer and four goats from the income I got in the 2019/20 production season. I am very grateful for this opportunity and plan to continue producing the crop using the experience I have obtained."

During an interview, the project beneficiaries in Walkituma Ibsa Kebele responded that, now not only are they able to buy sufficient food crops and other food varieties from the income generated from their onion production, but they are also able to invest and build household assets like a dairy cow, heifers, goats, donkeys and ploughing oxen to support their future livelihoods.

Having observed the success achieved during the demonstration and pre-scaling activities, farmers from the neighbouring areas organized themselves and proactively approached the project to get access to the Adama red onion. The organized farmers were able to collect more than seventy thousand (70,000) Birr and the project team facilitated the purchase and supply of the onion seed and created a direct link with the suppliers (Union and private agro-dealers) for future purposes.



## One 'Timad' Potato Package: A Proven Context Specific Approach for PSNP Households

### The Context

A baseline study conducted by the BENEFIT-REALISE Haramaya University cluster in 2018, in selected Productive Safety Net Program (PSNP) supported districts of East Hararghe zone, indicated that the productivity of major crops is low compared to the national average yields. Through a Participatory Rural Appraisal (PRA) study conducted in 2018, PSNP households had indicated the major challenge to them was to improve their agricultural productivity. The challenges included shortage of farmland, shortage of improved crop varieties, shortage and untimely supply of quality seeds and other agricultural inputs such as fertilizers, herbicides and pesticides, as well as their unaffordability. The costly and unaffordable standardized extension packages for different crops forces farmers to plant their own saved crop seeds without or with less fertilizer than the recommended dose, which resulted in low productivity and a loss on their investment.

### The Intervention

In response to these challenges, the 'One *Timad* Package' (OTP) was introduced by the BENEFIT-REALISE programme in 2019 and piloted by Bahir Dar University cluster on bread wheat with promising results. The phrase 'one *timad*' refers to 1/4th of a hectare and the OTP is a package consisting of the recommended amount of seed for the plot size (i.e., one *qindi* land size) with half of the recommended chemical fertilizer dose and half organic fertilizer prepared at home (composts or farm yard manure).

The main objectives of the OTP were to (1) downscale the package size of fertilizer to match the need and capacity of PSNP households, (2) provide PSNP farmers access to improved practices by avoiding the capacity limitation imposed by large technology packages, (3) minimizing farmers' risk in taking up new technologies by introducing proven technologies at the right (small) scale, with adequate hands-on training and follow-up, and (4) demonstrating the need to customize extension packages that match the capacity and needs of PSNP farmers with small landholdings. Of course, using compost also contributes to the carbon content of the soil and thus the water holding capacity of the soil. This in turn acts a climate change mitigation measure.

Based on the experience of the Bahir Dar University cluster, the Haramaya University cluster decided to use OTP approach for potato production in Haramaya woreda and bread wheat production in Kersa woreda of East Hararghe in 2020. However, under East Hararghe context, the commonly allocated farm size per household for a given crop is only 1/8th of a hectare, locally known as 'One *Qindi*' (OQ). Therefore, to customize the extension package towards the capacity and needs of farming households in these areas the 'One *Qindi* Package' (OQP) was implemented instead of OTP;  $OT = 2(OQ) = \text{two } qindi$ .

The OQP for potato production was implemented in Korke Kebele of Haramaya woreda during the early rainfall months (April to June) of 2020, involving 11 farmers on plot size of 0.125 hectare (i.e., one *qindi*) per farmer. The specific farm sites were

selected based on their potential for potato production, physical accessibility for frequent supervision, and willingness of the respective farmers to participate in the activity. The rainfall pattern of the area is bimodal with the first rainy season usually starting in March and extending to May while the main/long rainy season stretches from the end of June to September.

A potato variety (Gudane) obtained from Haramaya University was used for the intervention. The variety was released in 2006 from Holeta Agricultural Research Center. It matures within 90 - 120 days with reported yields of 29,000 kg ha<sup>-1</sup> and 21,000kg ha<sup>-1</sup> on research station and farmers' fields, respectively. The

variety was, therefore, selected for this OTP/ OQP intervention on the basis of its adaptation and better performance in the area.

The potato seed tubers were planted at the recommended rate of 20 quintals per hectare, i.e. 2.5quintals for one *qindi*. Half of the recommended rates of the blended fertilizer (NPSB) and urea, i.e., 100kg/ha-1 NPSB (12.5 kg/*qindi*) and 75 kg urea ha-1 (9.375kg/*qindi*) were applied at planting. Compost was applied to the soil two weeks before planting at the rate of 2.0 t ha-1 (250kg/*qindi*).

The following success stories are from a preliminary assessment conducted by the programme.

### The change Cases

Mr. Mohammed Yusuf is one of the farmers who participated in this OQP for potato production in Korke Kebele of Haramaya woreda in 2020. Mohammed said, "I harvested 33.00 quintals of potato from the 0.125ha of land using 2quintals of seed tubers supplied by Haramaya University cluster and 25kgs of NPSB and 19kgs of urea fertilizers with compost. From my harvest, I sold 17quintals of potato for 18,700 Birr. I saved 5 quintals for next season seed, 5quintals for family consumption, and gave 6quintals to relatives as seed". He added, " I used to produce sorghum on the same piece of land and have been harvesting only three quintals of sorghum. But now from this potato production I can get sufficient income that enables me not only to satisfy my family needs, but also finish the construction of my house I started near the town of Adele." Mr. Mohammed mentions that he is highly satisfied with the OQP and plans to continue to use the same variety and technique on a larger plot of land in the next season.

Mr. Adam Yuya Hassan is also one of the farmers engaged in the one *timad/qindi* package potato production in Korke kebele of Haramaya woreda in 2020. He is 45 years old and a father of five children. He said, "I harvested 19 quintals of potato of which I sold 14 quintals to other farmers as seed and obtained gross revenue of 15400.00 Birr. I saved the money for other food crops for family consumption. I can purchase at least 10 quintals of sorghum for family consumption with the income I got from the one *timad* potato production. In the past I used to harvest only 2quintals of sorghum from the same plot of land". Mr. Adan saved 1.5 quintals of potato for seed and gave 0.5quintal to his neighbor who is multiplying the seed under irrigation for the next main cropping season. Out of the potato harvested, he reserved 2quintals for family consumption while 1 quintal was given to relatives as seed.

Ibsa Abduraman is another farmer who participated in one *timad/qindi* package for potato production in the same kebele. He said, "I harvested 31quintals of potato of which I sold 27quintals to neighboring farmers (in the form of credit) as seed for next season and earned a total revenue of 36,450.00 Birr. So far I have collected from 20 farmers and expects to collect from the other 7 soon. I was happy to sell it to my neighbors who have seen the benefit and were eager to get the variety. I saved 3quintal of the harvested potato for the next production season, and I gave 1 quintal to a farmer who is producing during the off season under irrigation on the basis of "seed return agreement". One quintal was used for family consumption." He added. "This is the first time we got access to a new potato variety and its profitability has raised the moral of the whole community. I plan to increase the production to five *qindi* (0.625 ha) with a minimum of chemical fertilizer application and using much of farm yard manure during the next rainy season."



## Improved Faba bean Technology towards Food Security, Income Generation and Asset Building

### The Context

Faba bean is one of the major crops grown in Southern Ethiopia. Despite the suitability of the environment for faba bean cultivation and many efforts to disseminate improved faba bean production practices, the vast majority of farmers still grow local varieties. These include Bona Zuria and Kachabira woredas two of the seven Safety Net woredas located in the Southern, Nations, Nationalities and Peoples' Region (SNNPR) and Sidama Regions, where BENEFIT-REALISE Hawassa University (HWU) cluster is operational. Most farmers in the woredas are not aware of improved faba bean varieties, mainly due to the weak research-extension linkage, minimal agricultural extension service and lack of access to improved seed varieties. These problems are more pronounced in remote kebeles like Bona zuria woreda where road access is poor.

The low economic status of PSNP farmers in such areas further aggravates the problem of access to inputs and extension services. The resource poor farmers are given less attention by the extension system since they can't afford to purchase inputs, and because they are considered as late adopters of technologies. So, whenever a new variety is tested at a certain place, it is the well-to-do model farmers who are always given priorities. The 2018 Participatory Rural Appraisal (PRA) conducted by the programme also indicated that poor access to seed of improved crop varieties and financial problems of PSNP households to purchase seed and other associated inputs are major problems.

### The Intervention

In response to the above-mentioned challenges, under its Nutrition Sensitive Agriculture, BENEFIT-

BENEFIT-REALISE Hawassa University cluster introduced four improved faba bean varieties, namely Degaga, Dosha, Gabalcho and Tumsa with better agronomic practices in Bona Zuria and Kachabira woredas. Faba bean was chosen due to its suitability to the sites, its potential to improve nutritional well-being and food security status of the poor farmers, and also to generate income. The crop has additional benefits of maintaining and improving soil fertility. The 2019 faba bean demonstration / validation activity project reached 40 farmers (25 Male, 15 Female) in 2019.

Each farmer received training and inputs (18kg of quality seed, 4.5kg from each variety; 12.5kg NPS fertilizer and 125grams of bio-fertilizer) from the BENEFIT-REALISE Hawassa University cluster. The farmers were supported by development agents, the project experts and woreda partners who monitored the activities. Among the four varieties, Gabalcho and Tumsa showed superior performance, with mean grain yield of 37.7 and 35.6 quintals/ha, respectively. Due to their performance and farmers' preference, the two varieties were selected for pre-scaling. Accordingly, in 2020, Tumsa variety was pre-scaled in Bona and Kachabira woredas involving 200 farmers (50% female farmers). The variety Gabalcho could not be included due to lack of access to seed.

### The Change Cases

The following stories by Alemu Aboye and Gebre Aboye, a 50-year-old and 35-year-old brothers respectively, are good examples of how the project succeeded in changing the livelihoods of participating farmers through improved productivity of faba beans. The brothers are PSNP beneficiaries due to their small land holding, big family size and in Alemu's case because of his health problem.

Alemu Aboye said, "My brother and I were among the first selected to participate in the BENEFIT-REALISE HwU cluster's faba bean validation trails and pre-scaling activities in 2019 and 2020 respectively. I have 7 children and Gebru has 6 and we live in Hobichaka kebele of Kachabira woreda.

Alemu continued, "In 2019, my brother and I planted faba beans on 0.125ha of land using inputs (seed, NPS fertilizer and bio-fertilizer) provided by the project following our training on agronomic practice. Each one of us received 18kgs seed of the four varieties of faba bean, 12.5kgs NPS fertilizer and 125gms of biofertilizer.

We used to grow local faba bean varieties that are short and give low yield. The new varieties, Tumsa and Gabalcho varieties are tall and carry more pods along the height, and the seeds are big. I got six quintals of grain from my field, from the four varieties, out of which one quintal was saved for seed for the next season, 2 quintals were consumed, and three quintals were sold for birr 6,000.00. Gebru on his part saved one quintal for seed, consumed the two quintals and sold the remaining two quintals with birr 4,000.00."

The difference in yield is attributed to factors such as differences in inherent soil fertility of the land and crop management practices, or the possibility that some of the crop was consumed while it is still in the green stage.

Alemu continued, "We put our earnings from the sell together, added 1,000birr, and bought an Ox for Birr 11,000.00. Both of us never owned an ox before, now we can pair our ox with other farmers to plow our land."

Because of the high yield and good market value of the faba bean, the brothers used the saved two varieties of seed for 2020. They also participated in the project 2020 pre-scaling activity where each covering about 0.25ha of land. The project provided seed for the pre-scaling activity.

The faba bean 2020 pre-scaling field is harvested but yield data is not yet finalized since the harvest is not completely dry. However, field observation by farmers and stakeholders during field visits indicated that the brothers could get more than 10 quintals only from the pre-scaling plots of 0.25hectare and

an additional 10 quintals from the fields they planted with last year's saved seed.

With their additional earnings Alemu and Gebru plan to buy another ox. Alemu explained, "The asset we are building in the form of oxen will enable us to properly cultivate our land, and generate high income when we fatten and sell the ox(en) after a few years.

In these Dega (cool highland) areas, the major crops produced are barley and faba bean. The market demand for faba bean is high and the new variety (Tumsa) gives 2-3 times more than our local varieties. So we will continue to grow faba beans for home consumption and for the market, and improve our livelihood. Many farmers in the kebele are also interested to get the seed for cultivation. Thanks for the project, our eyes are open regarding the value of faba beans and how to feed our family all year round and build some assets to improve our livelihoods."

## Nutrition Sensitive Agriculture

One of the key performance indicators of BENEFIT-REALISE programme is increased Dietary Diversity Score for targeted farmers over project period compared to regional average. To this end, nutrition sensitive agriculture is adopted as a strategy to increase the production, availability and consumption of diversified, nutrient dense, affordable, culturally appropriate and safe foods in adequate quantity and quality, to meet the dietary requirements of populations in a sustainable manner. home gardening, Parma gardening, mixed farming such as intercropping and relay cropping were introduced to produce different fruits, vegetables, tubers and pulses so to address the underlining causes of malnutrition. The home/ Parma garden initiatives mainly target female farmers and women in male headed households because farming around the homestead is predominantly women's responsibility. And since women/ mothers are responsible for cooking family meals, being able to access vegetables in their backyard helps them improve their cooking practices and increase the consumption of diversified food for the whole family.



## Parma Garden Production: Improving Food and Nutrition Security

### The Context

BENEFIT-REALISE Oda Bultum University cluster has been conducting Parma garden demonstrations to improve the food and nutrition diversity in the project districts since 2019. It started based on the problems identified during a Participatory Rural Appraisal (PRA) study conducted by the project in 2018. The findings indicated that problems of food insecurity, inadequate vegetable seed, lack of awareness on nutritional value of crops, shortage of motor generators for irrigation and high cost of input were the major constraints faced by youth and women groups. In addition to these, challenges related to shortage of nutrition dense crop varieties, absence of an improved irrigation system, reduced performance of water sources, frequent drought, crop pests and unsuitability of topography that restrict normal use of irrigation channels. These all limited the production opportunities for vegetable crops during the main rainy season.

The cluster baseline data indicated that households in the area on average faced a 4.2 months food gaps, and the cluster average dietary diversity score was 4 crops per household. The poorest food consumption patterns were obtained from fish (0%), meat (0.7%), eggs (3.4%) and fruits (3.4%).

### The Intervention

In response to the above issues, BENEFIT-REALISE Oda Bultum University cluster started to demonstrate different fruits and vegetables through perma garden production, to ease the problems of food and nutrition security in the area.

The Parma garden demonstration was conducted in seven kebeles of four woredas namely Habro, Oda Bultum, Doba and Chiro of West Hararghe zone for two consecutive years (2019-2020). A total of 105 women farmers were engaged in the demonstration.

In-situ training was provided on improved vegetables and fruits technologies. The theoretical training on the Parma garden production approach and agronomic practices were given for all vegetables and fruits produced in the homestead. The in situ practical training was given for ten targeted female farmers on one women farmers' field, on beetroot and carrot production on two raised soil beds. All vegetables and fruits were supplied in the form of seedlings and suckers to all female farmers involved. The main seed and seedling sources were Agricultural Research Centers (Mechara and Melkasa), private agro-dealers and Chercher Oda Bultum farmers Union.

Major lessons learned in the implementation process were related to shortage of seed supply, pests and disease, and water shortage. In the case of seed supply it is important to link farmers with seed suppliers who can provide small packed size seed of demanded varieties.

Overall, the project provided female farmers with varietal choice, food diversity options, technical and theoretical knowledge and skills and reduced their different vegetables food expenditures. The women farmers are now eager to produce vegetables and fruits on large fields not only for home consumption but also for the market to increase their income towards asset building.

## Stories of Change



Hindi Ahmed is a PSNP (Productive Safety Net Programme) beneficiary and one of the women selected to participate in perma garden demonstration starting from 2019. She is a 45-year-old mother of 5 children (3 males, 2 females) and lives in the lowland area of Tokuma Meta Lencha kebele in Doba woreda.

Hindi said, "Before the project intervention I only planted some of those vegetable varieties for the market and rarely used them for consumption at home due to my financial limitations. In 2019, the project trained me and gave me seed for home garden production. I was not convinced with the small amount of seed they gave me at first and I was really surprised with the outcome. I planted vegetables such as onion, beetroot, chili pepper, swiss chard, head cabbage, tomato and carrot as well as fruits such as banana, papaya and avocado in my home garden. Producing different vegetables and fruits from a small plot of land was a surprise for me. Outside what we consumed I saved about 5,000birr from selling the surplus I produced."

My family diet has changed significantly. We have been eating fresh vegetables for the last four months from my own garden. My children consume fresh carrot daily. They also like working in the garden. The proximity of the perma garden to our home helped us giving frequent care. My family experience and knowledge on vegetables has improved and I plan to continue year-round production of different vegetable varieties from my home garden using the experience I developed." She added, "I also showed seven women farmers in my area what I have learned and supported them technically whenever required." In 2020, six diversified vegetables such as onion, beetroot, Swiss chard, head cabbage, tomato and carrot seed were supplied for Hindi by the project.



Naema Ahmed joined the perma garden demonstration in 2020. The 26-year-old mother of 4 lives in the highlands of Walkituma Ibsa kebele of Doba Woreda. She said, "Last year, I produced only one "kirchat" of sorghum – about 10kg which is about 1,300birr when converted to money, from the plot I allocated for home garden this year. I planted onion, head cabbage, tomato, carrot, beetroot and swiss chard around my home from seed support given by the project. In addition to consumption at home for the last four months, I was able to sell the surplus produce of head cabbage and beetroot, for 2,000birr. I purchased food items such as sugar, edible oils and salt for home consumption.

At first my husband was reluctant to support me when he saw the small amount of seed and would not even help with the land preparation. I had to ask my neighbors to help out. After I planted and managed it according to what I have learned and he saw how well the vegetables were doing he was happy to support me fully. He even bought beetroot and swiss chard seed from the market and planted them. Using different vegetables and fruits varieties helped us identify the best adapted variety among the choices provided to us by the project. Now, we consume fresh vegetables any time we want from our garden and our nutritional diversity has improved considerably. "

Interview with most targeted women showed that in 2020, farmers were able to get a minimum of 1200 birr and maximum of 7,800birr from selling their surplus vegetables. The women were able to collect up to 98 fruits from bananas per plant within one year and in irrigated areas up to 300 per plant. The average yield of fruits collected from papaya ranged from 65-140 per plant in different project implementation areas.



## High Yielding and Early Maturing Sweet Potato Variety Improving Food Security of Poor Households

### The Context

A Participatory Rural Appraisal (PRA) conducted by BENEFIT-REALISE Haramaya University cluster project in 2018 showed that Productive Safety Net Programme (PSNP) households do not produce sufficient food even under normal conditions and face a 5 to 7 months of food gap. Recurrent drought is the main contributing factor affecting the production and productivity of crops. In addition, the study showed that PSNP households have no or limited access to improved crop varieties and production technologies.

### The Intervention

In response to these challenges, improved crop varieties such as the sweet potato variety (Adu), potato variety (Gudane), maize variety (Melkassa 2), as well as improved varieties of sorghum and common bean and agricultural technologies were introduced by the programme from 2018 to 2020.

Adu is a high yielding, early maturing sweet potato variety that is rich in vitamin A. The variety known for its nutritional benefits in addition to its food security merits was released from Haramaya University in 2007 in Eastern Ethiopia (Hararghe). However, its distribution and adoption has been limited to easily accessible and relatively high potential agricultural areas.

The programme, through its Nutrition Sensitive Agriculture (NSA) intervention, has reached 1452 PSNP households (of which 691 female headed households) in 16 kebeles of six woredas, namely: Kombolcha, Jarso, Fedis, Meta, Gurawa and Bedeno in 2019 and 2020. Out of these households, 1050 (389 female headed households) were engaged in pre-scaling of sweet potato variety (Adu). The farmers were selected with active involvement of the woreda agriculture offices, kebele administration, and the community using pre-identified selection criteria such as PSNP membership, availability of land, gender and interest. A total of 179,900 vine cuttings of the sweet potato variety were obtained from Haramaya University and provided to the farmers.

The following change case is an extract from a preliminary assessment conducted by the programme.

### The change Cases

Safiya Ahmed Abdule, a 54-year-old mother of 10 (4 female), living in Jilcha village, Wayiber kebele of Meta woreda, was one of the first 50 farmers in her kebele selected to take part in Adu pre-scaling activity in 2019.

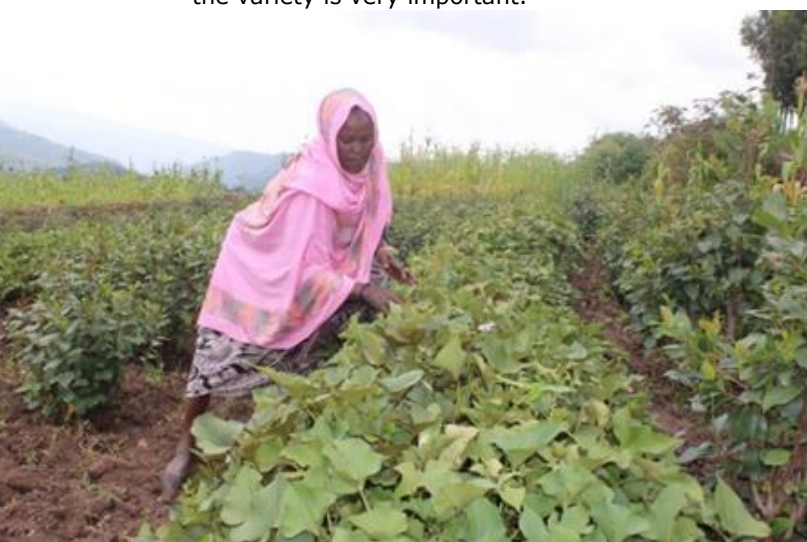
Safiya and her husband have 5 'qindi' (0.63ha) of land that they use for growing different crops such as maize, sorghum, common bean and sweet potato. They also produce 'khat' (*Catha edulis* Forsk.) which is the main source of cash income for the household.

According to Safiya, drought is the main threat to agriculture in the area, decreasing the production and productivity of crops and thereby affecting people's livelihoods. Despite its relative advantage in tolerating drought, the local variety of sweet potato is still impacted by drought and its yield significantly decreases when there is shortage of rain. On the other hand, too much rain also increases the development of its aboveground leafy biomass, making it unsuitable for intercropping, a common practice in the area. The prolonged period for reaching maturity is the other limitation of local sweet potato varieties.

In 2019, Safiya started growing Adu variety on a small portion of her land (0.04ha) and was able to harvest 1.2ton (equivalent to 30t/ha). Witnessing the higher and better-quality yield, she has expanded to produce Adu variety on 0.1ha in 2020. She said, "Before the REALISE intervention, what I produced was not enough for the consumption of my household. Therefore, we never had any surplus to sell. I had no experience of selling sweet potato tubers. That changed after growing Adu variety. I made around 1950.00 Birr from the sale of surplus tubers for the first-time in 2019. Observing and understanding the advantages of Adu production, the surrounding farmers are asking me for vine cuttings which I have provided to six farmers so far." When asked about her future plan, Safiya said "I want to expand the production further and continue to use it for consumption and as a source of income. I also want to give the cuttings to other farmers as the variety is very important."

When asked about her future plan, Safiya said "I want to expand the production further and continue to use it for home consumption and also as a source of income. I also want to give the cuttings to other farmers as the variety is very important." Safiya concluded her comments by saying, "The high yield, good taste, early maturity period, and relatively low aboveground biomass (that makes it suitable for intercropping) are among the favorable characteristics of Adu variety. The local varieties take five months to mature while the new variety Adu matures in three months. I want to thank the project for giving us this variety and we can even do better if we receive continuous support in the future".

Many other farmers in the 16 intervention kebeles also share similar experiences as Safiya. Outstanding results have been registered with farming households obtaining up to 30ton per ha yield producing Adu variety in 2019. This is three times as much when compared to the 10t/ha yield for local varieties. This increase in production coupled with early maturity and good taste of the variety has contributed to improved food security and reduced food gap months. The demand for the variety and ongoing farmer to farmer dissemination of the variety is rapidly increasing as a result of these encouraging results.



*Safiya's sweet potato (Adu variety) planted between the alleys of Khat (Catha edulis Forsk)*



## Sweet Potato: A Means to Food and Nutrition Security and Livelihood Diversification



*Dedu Tujara, Dodota Alem Kebele. Dodota Woreda, Explaining about her sweet potato to the field visitors*

### **The Context**

Dodota woreda is among food insecure areas of Arsi Zone, and has been receiving support from the PSNP for over a decade. Variability and shortage of Rain Fall (RF) and a long dry season have contributed to crop failures in the past. This phenomenon is highly pronounced in the case of PSNP households, who compared to their counterpart non PSNP households, have less coping, adaptation, and resilience capacities. The results of the Participatory Rural Appraisal (PRA), Baseline survey, and scoping study conducted by BENEFIT REALISE in 2018 show that prolonged months of food gap, very limited food diversity, and limited choices of strategic food security crops other than crops like maize, characterize the household livelihoods and farming system.

### **The Intervention**

With the objective of reducing months of food gap as well as increasing household nutritional diversity of the PSNP farming community in particular, BENEFIT-REALISE Arsi University cluster selected sweet potato varieties that have been proven by research centers for fitting to similar agroecology and farming systems. Among other reasons sweet potato is known as a strategic food security crop that

fits to the PSNP farming community in terms of its ability to withstand moisture stress, its high

The project introduced two varieties, Hawassa 09, from Hawassa Research center and Adu variety from Haramaya University Root and Tuber improvement programme, in six kebeles during 2019 (demonstration) and eight kebeles during 2020 (pre-scaling). Through demonstration and pre-scaling, the intervention covered a total 59 and 640 households during 2019 and 2020 respectively.

The project was implemented in close collaboration with stakeholders from Hawassa Agricultural research center and Haramaya University root and tuber improvement programme who were instrumental in accessing the planting materials (cuttings), and kebele, woreda, and zonal level office of agriculture and natural resources who were instrumental in implementing the intervention at grass root levels. The improved varieties of sweet potato were brought from Dire Dawa and Hawassa a distance of about 450km and 250km respectively, by the programme staff.

## The change Cases

Dedu Tujara is a 45-year-old widow who lives in Dodota Alem kebele of Dodota Woreda, Arsi Zone of Oromia Regional State.

"My husband died ten years ago, leaving me with seven children to take care of. My family livelihood depended on crops, mainly barley, maize and wheat that I grow on less than one hectare of land. That is why I have been a beneficiary of the Productive Safety Net Programme (PSNP) since 2011 GC.

During the 2019 cropping season, I was approached by the BENEFIT-REALISE Arsi University cluster project through the kebele administrators, DAs and the project staff. I was involved to try out sweet potato production on my farm. I have never received crop technology-based assistance nor had I seen or heard of sweet potato production before. So initially, my family and neighboring farmers were reluctant to join.

But eventually, with reservation, I allotted about 300 m<sup>2</sup> of my land and prepared the land and ridges following the orientations and training provided by the experts. During training, we were also informed that the varieties are known for their nutritional value, can adapt to dry conditions, are early maturing, high yielding, and don't need any mineral fertilizers; unlike other crops we grow in our area. In spite of these potential benefits, I was still doubtful of the results.

My level of doubt was pronounced more when the project experts brought a runner stem with leaves of the crop (what is called cuttings) as the planting material. From my previous experience we were expecting either seed tuber or seedlings with roots, like a potato or onion respectively. But what we received was something that looks like leftover stock of leaves and sticks and weeds. Even my children were not interested to assist me during the initial stages of the production activities. But since it was too late to change my mind to grow other crops, I went along with the activities.

I listened to the experts' advice on planting, weeding and other management, and to my surprise I saw a tuber forming in about two and half months after my planting. A month later, (after three and half months in total) we started to harvest the sweet potato from our plots, and I was very happy. I harvested about 15 quintals (1.5 tons) from that small plot, much more than I ever harvested from any other crops on the same size plot, even when applying mineral fertilizers.

I can testify that sweet potato is really a food security crop. Unlike other difficult times, I now have something to feed my children during those food shortage months (food gap months). I also sold the surplus in the local market and bought other food items for my family, and covered educational expenses of my children, which I have always struggled with. With the money that was left, I was able to buy one goat and now, a year later I have two goats.

Following the advice provided by the project experts, I saved my sweet potato vines in order to plantdd again in the 2020 season. The crop not only contributed to shortening months of food insecurity in my household, but we like the taste and the income we obtained and how we were able to invest in other household food and non-food items. Additionally, I like the simplicity of the technology, like using cuttings as a planting material unlike other crops grown by seed. This year about 14 farmers received the cuttings from me, and I gave them orientation on how to grow them" she added with a smile.



*Dedu Tujara with her children in sweet potato field*



## Orange Fleshed Sweet Potato Contributing to Food Security and Nutrition

### The Context

Many of the households in Derashe woreda, SNNPR, suffer from chronic food and nutrition insecurity and are supported by the government's Productive Safety Net Program (PSNP). Cassava and sweet potato are two important starchy root crops for most communities in the area. The crops are generally grown on small plots of land with no inputs other than labour. Farmers mainly grow low yielding varieties of cassava and sweet potato, and attest that pests and diseases represent a major constraint to their production

### The Intervention

In 2019, with an objective to diversify the cropping systems with nutrition dense crops in the area and creating awareness to the community on issue of nutrition, BENEFIT-REALISE Arba Minch University cluster introduced Orange Fleshed Sweet Potato (OFSP) known as an excellent source of vitamin A. In 2020, under its nutrition sensitive agriculture efforts, the project reached a total of 5165 households (50% women). The following is a story told by one of the beneficiaries of the project.

### The Change Case

"My name is Tadese Bogale. I am a 48-year-old father of 5 children. I live in Derashe Woreda Arguba Tenaho kebele and inherited a farm from my father. For the last ten years, I have been cultivating local sweet potato varieties using local practices.

In 2019, I was selected as one of the target farmers of the programme. I received cuttings of improved OFSP and a training on how to plant and manage them from experts of the project. With follow-up advice from development agents residing in our kebele, I planted OFSP on a plot of 200 m<sup>2</sup>. I was surprised to see a yield of over 7 quintals from just 200 m<sup>2</sup> (which is equivalent to 35t/ha), three-fold of the local variety. The OFSP is better in terms of yield and tolerance to pests and diseases. I was also able to show and distribute the vines to neighboring farmers in our community benefiting more than 50 farmers. I used the remaining vines as cattle feed. There is also a possibility to market the vine in the future when I have in excess of what I need. We started cooking and consuming the tuberous roots. My children love the taste and the color of the OFSP. I feel like my farm is a great success and hopefully, in addition to household consumption I will be able to sell the tuber and earn income in the near future."

## Improved Potato variety for Food Self-sufficiency, Improved Nutrition and Income Generation

### The Context

North Wollo's agriculture and feeding habit is mostly dominated by cereal crops. Although the area is endowed with favourable environmental conditions for potato production as well as marketing, the production and productivity of potato is very limited. Unavailability of improved potato varieties with its production package, lack of information and misconception about the crop, were identified as limiting factors for the low production and consumption rate of the crop in the area.

### The Intervention

Bearing the challenges of the woreda in mind, BENEFIT-REALISE Woldia University cluster carried out a potato production technology promotion activity in 2019. The objective was to demonstrate an improved potato production package and its contribution to food and nutrition security improvement of PSNP households in the highland of North Wollo.

The improved potato variety 'Belete' has multidimensional benefits, mainly to improve food and nutrition security of households and generate income. The project conducted a demonstration of the improved potato variety with the participation of 58 (44 Male and 14 female) farmers in Maserut kebele, Meket Woreda, North Wollo Zone. Some of the key success factors of the project included in-situ training, creating & raising awareness of farmers on the multiple uses of the crop, working on the eradication of cultural taboos that hinder the production of potato and building farmers' capacity and skill in the production processes, etc.

In 2020, because of the promising results obtained in 2019 and recognizing its potential for easy scale-up, the programme started pre-scaling of the improved variety in the Meket and Wadala woredas engaging 205 farmers (female 10, Male 195). To ensure farmers earn better income from the sale of their produce, the project facilitated market linkage with local seed producer cooperatives and NGOs like

Organization for Rehabilitation and Development (ORDA) in Amhara region. The following story of change is a good example how farmers showed measurable changes in their livelihoods. Most of the participating farmers got as much return as expected, with an average produce of 25.24 ton/ha.

### The Change Cases

Nigussie Gelanew, a 41-year-old farmer lives in Maserut kebele of Meket Woreda, N/Wollo Zone. He is the breadwinner of the family while his wife cares for their 2 children. Nigussie's family livelihood depends on agriculture, growing cereals on a small plot of land (1/4th of a hectare) given to him by his father.

Nigussie learned about the importance of growing potatoes for improved nutrition and food security from BENEFIT-REALISE Woldia University cluster experts. At first Nigussie was uneasy and reluctant, since producing potatoes for consumption was not a common practice in his community. Therefore, the programme activities started with intensive awareness raising activities on the use of potato for food security, nutritional value and as income generating crop.

Nigussie said, "In May 2019, the project gave me 2.5quintal of improved potato seed (Belete variety) through credit to be paid back in-kind to the cooperative in our area. Based on the training I received from the project experts and DAs, I planted the seed on 0.125 hectare of land and applied all required management practices starting from land preparation up to post harvest handling. I harvested 20quintal of potato, paid back the 2.5qt in-kind loan, sold 4qt for 14,000.00 birr as seed tuber and saved about 3.5qt to use as seed for the next season and (about 9qt for family?) my family consumption.

With the money I earned, I bought 4 male goats for fattening since I have always been interested in the business. Within a year, the number of goats I have to fatten has increased to 12 and was able to earn 20,000.00birr profit. The current estimated value of my 12 goats under fattening is more than 45,000.00 birr. The start of potato production and earned income allowed me to accumulate assets exceeding 65,000.00.

Nigussie is now a model farmer to many other farmers in his village. He is playing a key role in practically showing the economic & nutritional benefits of potatoes and breaking the tradition that undermines the value of the crop when compared with cereals & other crops.

Nigussie continued, "In general, with the success I achieved with the 'Belete' potato variety production I was able to diversify my livelihood, dramatically changing the life of my family and becoming a role model for farmers in my community. Nowadays, potato is becoming an important crop in terms of generating income and securing food & nutrition, and there is a high interest to produce more of the crop next year. If we can look beyond our tradition and focus on how to solve our economic challenges before us, and properly use the knowledge & skills provided to us through experts like BENEFIT-REALISE, we can reach our dreams and bring real positive changes.

## Crop Diversification as a means of Risk Aversion



### The Context

Based on the finding of 2018 Participatory Rural Appraisal (PRA) study in 2018, conducted by BENEFIT-REALISE Arba Minich University (AMU) cluster, Gayisa kebele, Zala woreda in SNNP Region is greatly affected by environmental stresses including drought as well as biotic constraints such as field and post-harvest pests and diseases.

### The Intervention

To address the above-mentioned challenges, the project 2020 interventions focused on crop diversification and introduced vegetable crops, orange fleshed sweet potato, papaya fruit and Haricot bean (Hawassa Dume) varieties with an aim to minimize food gap months and improve the livelihood of the surrounding PSNP farmers.

The intervention was successful in closing existing food gaps of selected PSNP farmers. In 2020, 5,165 households have adopted home garden technology for their household nutrition security. The target of this intervention are predominantly women as they are responsible for cooking of daily family meals. In general, the programme addressed 14,340 PSNP and NPSNP farmers in all the programme intervention wordas. 50% of the farmers reached were female farmers.

### The change Cases

Aregash Mudo is a 31-year-old PSNP farmer selected for the crop diversification project. She has 6 children, and makes her living on farming. Before her involvement in the BENEFIT-REALISE project, her family was highly affected by food shortage.

Aregash said, "Farming is my main source of livelihood and have been doing it for the last 15 years. But what I produce has never been enough to feed my family and that is why I have been depending on PSNP support for many years.

Since I have learned about the BENEFIT-REALISE project in 2019, I have learned eight different technologies and been implementing them on my farm. I have received training by the project experts and development agents on each of them.

The type of technologies I received include papaya, vegetable crops, haricot bean, orange fleshed sweet potato and maize. In addition, I have been practicing a 1-timad package on orange fleshed sweet potato. I am excited and motivated by the technologies and the training given to me and the skill and opportunities of understanding best farming practices."



*Aregash Mudo showing the status of O/F/Sweet potato (Dilla Variety) in her farm*

In the past I have been consuming Moringa leaf as a source of vegetables. Now, I feed my family different vegetables, maize, haricot bean, etc. I will be harvesting Papaya fruit and orange fleshed sweet potato in the coming weeks. I am expecting a good yield from my papaya trees. I have more than 10 seedlings in my backyard.

I used the vegetable for both household consumption and as a source of income and earned 1,700 birr from the sales of carrot, Ethiopian kale, beetroot and swiss chard in one-production cycles. In addition to this, I am producing beans which I learned are inexpensive source of protein for rural households, vital for reducing poverty and improving food security and nutrition.”

Because of the erratic rainfall patterns in the area, the project promoted drought tolerant bean varieties together with improved agronomic practices.

Aregash continued, “This year, I harvested 6 quintal of haricot beans from 0.25 ha of land and used it for household consumption.

Overall, because of the project, my yield of crops has increased, my diet has diversified and have been getting additional income. I will surely continue with the practices and make sure my children, friends learn from my experience and encourage others in the community do the same.”

Hosting other farmers during the field visits Aregash Mudo has now become a trainer to other farmers in the community.



## Papaya Pre-scaling for Improved Nutrition and Income

### The Context

The farming system in Raya Alamata is cereal based. The major crops are sorghum, teff and maize. Though the area is suitable for tropical fruits, cultivation and availability of improved fruits cultivars is very low.

### The Intervention

To improve the livelihood of poor farmers, especially women who mostly depend on their husbands for their needs, BENEFIT-REALISE implemented papaya pre-scaling activity in Raya Alamata woreda in 2019. The papaya intervention was made in collaboration with BOA, DAs, Research centers, CASCAPE and private seedling producers. Female headed households farmers were selected together with DAs and woreda experts. Then, training was given by researchers and BENEFIT-REALISE experts on agronomic practices, utilization and post harvest handling. Seedling production was done in collaboration with private papaya seedling producers, and distributed together with woreda BOA and DAs.

Continuous follow up was conducted to ensure management/agronomic practices are being followed and address issues related to diseases.

### The Change Cases

Kalefu Dero Berhe is a 40-year-old farmer who lives in LaelayDayu kebele, Raya Alamata Woreda. She is female household head with family size of six, has 3 children and is supporting her father, who lives with her.

Kalefu said, "The major crops cultivated in our farm are sorghum, teff and maize. In 2019, BENEFIT-REALISE Mekelle cluster gave us papaya seedling. I received 30 papaya seedlings by the project and were trained on how to manage them.

At the beginning, we faced challenges related to shortage of water during the off-season and disease. But we sprayed chemicals that took care of the disease and the rain came later. So the trees started growing fast. After nine months, we have already started consuming papaya and selling part of it.

Papaya does not need intensive management like vegetables, so my workload has decreased considerably when compared with times I used to grow onions on the same plot of land. I can also see the health benefit in my children and my father who I take care of. My father actually prefers to eat papaya rather than injera (traditional bread).

When my children are hungry, I give them papaya to curb their hunger, until I manage to cook something for them. I also serve it when guests come to my home, I do not worry whether I had injera or not.

We are selling it for about 20-30 Birr per papaya and we are using that money to purchase other food items and recently bought sheep from the papaya earning.

Right now, I am benefitting from from intercropping with onion. My future plan is to scale up my production and increase the number of seedling intake."



## Maradol Papaya Demonstration Improves the Diet Quality of Poor Households

### The Context

Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life. It is not only about calorie intake but also consumption of a diversified diet which promotes the intake of different nutrients and prevents diseases. In food-insecure areas, meeting minimum standards of dietary requirement is a challenge that has often been overlooked.

BENEFIT-REALISE Bahir Dar University cluster baseline study conducted in 2018 indicated about four food items are consumed by households in western Amhara which is regarded as the lowest range. From the food groups, fruits were the least consumed where only 1% of the respondents reported to include in their diet.

### The Intervention

To address this challenge maradol papaya demonstration activity was implemented in 2018/19 and 2019/20 cropping seasons by BENEFIT-REALISE Bahir Dar University cluster. In strong collaboration with woreda offices of agriculture 12,500 papaya seedlings were distributed for 575 farming households in Ebinat, Libokemkem and Goncha Sisoenese woredas in 2018/19. Moreover, in 2019/20 510 farmers participated from the same woredas.

### The Change Cases

Adane Gete, 37, is a farmer in Ebinat woreda Gelamatebiya kebele with a family size of five. In 2018/19 he was one of the beneficiaries of BENEFIT REALISE Bahir Dar University cluster Maradol Papaya demonstration.

Adane said, "I am very happy with the papaya harvest to use it for my household consumption. My wife's health started improving after we start consuming the papaya fruit. Over the past few years, we have spent thousands of birr to take her to the medical center up to Bahir Dar. The doctors told me to feed her fruits but I couldn't afford to purchase every time. Once we started harvesting our papaya fruit now she is consuming papaya fruit regularly and her health has improved considerably. I am very grateful for the opportunity and plan to expand my fruit production. I even bought a donkey to help me transport water so that I can increase production and start earning some income"



Awekech Arage, 28, is the head of her family with six members. She is a farmer living in Ebinat woreda Gelamatebiya kebele. She has received eight maradol papaya seedlings in the 2018/19 cropping season and now she started harvesting the fruits for household consumption and market.

Awekech said, "Even though I learned the benefit of consuming fruits from the health extension workers, I didn't have any means of getting them for my family until I joined the activity by BENEFIT-REALISE Bahir Dar University Cluster. They gave us training on papaya fruit production and told us to dig holes for the seedlings and then they brought the seedlings. I planted and took good care of it as I have learned. I watered it regularly by bringing water from a nearby river using my donkey cart. Unlike the local papaya trees, this maradol papaya started flowering and bearing fruits within seven months. Now I am getting the return from my investment of time and effort. We are eating papaya fruit regularly and started selling it whenever we have extra fruits. I started sharing my experiences with other fellow farmers as well. I plan to increase the number of papaya fruit trees and get more benefit from it through selling to the local market.

## **Support to Women and Youth**

Interventions designed to specifically improve the livelihoods of women and youth.

In most areas in rural Ethiopia, both male and female members of the farm household are involved in various types of farm activities. Newly introduced technologies and practices may require more (family) labour with a heavy work burden on women. Therefore, to evaluate the gender balance in newly introduced technologies is to assess the labour contribution of male and female members of the household.

# Improved Potato Variety Resulting in Livelihood Diversification of Poor Women Farmers

## The Context

Eastern Zone of Tigray is characterized by erratic rainfall, small landholding, low agricultural productivity and high risk of food insecurity. The average rural household has 0.5 hectare of land (compared to the national average of 1.01 hectare of land and a regional average of 0.51). 38.9% of the population is in non-farm related jobs, compared to the national average of 25% and a regional average of 28%.

Ganta-Afeshum is one of the woredas in the zone widely affected by recurrent drought and food insecurity, where most households are supported by the Productive Safety Net programme (PSNP). Farming is largely dependent on erratic, short and one season rainfall. Farming land is heavily degraded and most farmers did not have access to improved and adaptable crop varieties and crop management skills.

## The Intervention

To address the major challenges faced by the PSNP farmers, BENEFIT-REALISE Mekelle University cluster started implementing its programme in Eastern Zone of Tigray in 2018. Based on the specific need of the farmers, the programme started its intervention in 2019 in 10 woredas of the region and continued implementation in 2020. In 2020, one of the interventions directly benefited 150 farmers through Gudene potato variety pre-scaling activity. The activity was led by Ganta Afshum woreda office of agriculture as a key stakeholder and supported by BoA, cooperative union and regional research institute. Potato seed, training on crop management, backstopping and monitoring were provided by BENEFIT-REALISE programme experts.



## The change Case

Alem Gbregzabher Kahsay who lives in Ganta Afeshum Woreda, Sasun Kebele said, "I am a 40-year-old farmer, who heads a family of four members. I depend on agriculture, growing major crops like wheat and barley during the summer season, and carrot, cabbage and potato during off season using irrigation. I was selected to participate in BENEFIT-REALISE Mekelle University cluster activity since I was a PNSP beneficiary, Female Headed Household (FHH) and have access to irrigation.

I used 20x10m<sup>2</sup> of my plot to plant 100kg of Gudene variety potato tubers provided by the project. The project experts also gave us in situ training on production practices. I was very happy at its vegetative stage, since there was no symptom of disease. I obtained 6.5 quintals (qt) from my plot. Since the variety is highly demanded at the market, I sold 5 quintals for 9 Birr per kg, for a total of 4500 birr. I returned 1 qt seed tuber in kind to the cooperative union as per the agreement I signed while receiving the seed. My family consumed about 50 kg at home.

With the money I earned I bought 25 two weeks' old improved chickens. I also plan to purchase sheep by getting additional credit from micro-finance. This is a big change in my livelihood and I feel lucky to have participated in such a life changing intervention.



"My Name is Tsige Gebremicael Yebiyu, a 55-year-old who lives in Tigray region, Ganta Afeshum Woreda, Sasun Kebele. I am a head of a household with six family members. My family is dependent only on agriculture and has been supported by the government PSNP for years. On the 0.6ha of land I own I grow wheat, barley, maize, field-pea, potato and *teff* during summer season and pepper, cabbage, tomato and garlic during off season using irrigation.

I was very excited when I first heard from Development Agents (DAs) about BENEFIT-REALISE Mekelle University cluster programme activities that aimed to support PSNP farmers who have access to water. Though I do not know the name of the variety, I have previous experience in cultivating improved potato varieties and was aware of the benefits in engaging in improved seed.

I received one quintal Gudene variety potato tuber, which I planted on approximately 0.045 ha of land. But I got sick and was not able to attend the in-situ training provided. But I did not want to miss the opportunity so I made sure my son attended the training on potato agronomic practices from the woreda and the project experts.

The vegetative growth went very well with no disease and after harvest, I returned the 100 kg of potato seed in kind to the FTC as per the agreement I signed with the multipurpose cooperative and the project. We consumed some at home and gave some to our neighbours and relatives, and sold 525 kg of potato with 20 birr per kg, earning a total of 10,500 Birr. With my added income, I started to feed my cow with concentrate instead of straw, as a result I am currently selling 3 liters of milk per day in addition to what I consume at home.

With the money I earned I also bought 1qt of *teff* for home consumption for 4200 birr/qt ensuring the food security of my home for the coming year.

The variety is highly demanded and more preferable in the market than other varieties, because of its high yield, it a good quality, white colour and smooth tuber. My neighbours are asking for the seed as they have seen the benefits. I am encouraged with the outcome and if I continue like this I am very hopeful to graduate from PSNP soon.

The project brought a big impact on our income and nutrition. Moreover, we have seen that continuous access to quality seed is important to permanently improve our livelihoods.



## Youth Learning New Ways to Escape Unemployment

### The Context

Youth employment presents a serious challenge to Eastern Amhara region. The region faces growing youth landlessness in rural areas and insignificant rural job creation, leading to increased migration to urban areas. Effective youth employment policies and interventions require an exhaustive understanding of who the unemployed youth are, where they are located, and the types of jobs youth are engaged in. Unemployment, landlessness and inconvenient credit access for youth group were frequently mentioned as limiting factors for the livelihood of youth in the rural area of Eastern Amhara region.

Consequently, BENEFIT-REALISE Woldia University Cluster, piloted a small-scale poultry production project as an employment opportunity for youth in selected PSNP woredas of Eastern Amhara. Poultry production is a substantial income generating business, and it has a significant contribution to food security and poverty alleviation. It is an important income generating business, especially for low-income food-deficit countries like Ethiopia. In addition to its significant contribution to food security and poverty alleviation, it is also known for its ecologically sound management of natural resources and as a source of high-quality protein for the fast-growing population in the country.

### The Intervention

Cognizant of these factors, one of BENEFIT/BENEFIT-REALISE Woldia University cluster interventions focused on small scale poultry production in two woredas of North Wollo Zone namely Habru and Wadila. A total of 16 youth (8 male, 8 female) were engaged in this intervention for each beneficiary, the project provided 50 Bovan Brown 90-day-old pullets with 250kg of starter feed through credit, and a one-day training on poultry production.

Before distributing such pullets, environmentally controlled poultry houses were built. In each poultry house feeding, watering, and egg collection systems were properly developed. While locally available materials such as stone, wood, mud and labor were supplied by the youth themselves, factory products such as mesh-wire, iron sheet and nails were supplied by the project for the construction of the poultry house.

To ensure sustainability and create a sense of ownership, the project beneficiaries were fully involved in business idea generation, labor, material and financial contribution. The project also provided seed money (through credit via RUSACCO, rural financial service) and entrepreneurial skill training.

Regular follow up and careful management support was provided through mentoring and coaching with skilled and knowledgeable experts until the youth became self-sufficient.

BENEFIT-REALISE Woldiya University Cluster has been working in collaboration with the District office of Agriculture at woreda and Kebele level, Women and Youth Affairs Office, RUSACCO and Sirinka Agricultural Research Center. Stakeholder engagement has been crucial from the start in the selection of the youth, provision of training and technical support as well as follow ups and monitoring of progress.

The following story of Genet Manaye, is a good example of how BENEFIT-REALISE intervention on running a small-scale poultry production business transformed the lives of the unemployed youth.

### **The Change Case**

Genet Manaye, age 27-year-old mother of 3 is a single mother who lives in North Wollo Zone, Wadila Woreda, Timtimat kebele. She said, "In 2019, I was selected to participate in BENEFIT-REALISE Woldia University cluster small scale poultry production intervention. At that time, I did not have any job and depended on occasional income from petty trade. My family's life was difficult. In addition to my kids, I have a sister I am responsible for. She is attending her college education at Woldia College of teachers' education, and it was very challenging to cover her cost for transport and meet the basic needs of the family such as food, house rent, scholastic & sanitary materials. Life was tough and desperate with no hope for tomorrow.

In September 2019, I received a one-day skill training on small scale poultry production and was given 50 Bovan Brown 90-day-old pullets with 250 kg of starter feed through credit. Within just two months from the start of my business, I began selling eggs earning good income.

On average, I earn a monthly net income of 2,985.00 birr and have reported a 30,000.00 birr earning in the last ten months." She added with a smile. "I am earning more than a degree holder government employee in Ethiopia. And I have time to do other things during the day compared to those employees who are working for the government and private organizations."

The total initial investment cost for the business was ETB19,613 obtained through credit. Genet had already repaid half of her loan to RUSACCOs, and

ready to pay the remaining loan in full in the coming months. Encouraged by the return of the business, she is also planning to increase the number of laying chickens.

"My plan is to expand my business four-fold i.e. from rearing 50 layers to 200 layers thereby increasing my net monthly income from 2,985.00 to 11,940.00 birr. And in the future, God willing, I have big dreams to manage a large-scale poultry farm. The project has taught me what I can achieve and that my attitude determines my future." she added.

Genet is becoming a good role model for the youth, women and all others who are struggling to make ends meet. While grateful for the project that supported her to start the business, she is showing others the value of determination and hard work to improve their lives.

The pilot showed that small scale poultry production is an ideal business option for the unemployed youths and women. It requires minimal investment cost when compared with other livestock businesses. Government partners and other local stakeholders should support these youth initiatives by creating sustainable input and product



## Improved Chicken Breed for Income and Diversified Diet for PSNP Women

### The Context

West Hararghe zone is one of the top food insecure zones in Ethiopia, where most smallholder farmers are supported by the government flagship social protection programme - Productive Safety Net Program (PSNP).

A Participatory Rural Appraisal (PRA) study conducted by BENEFIT-REALISE Oda Bultum University cluster in 2018 showed that food insecurity, shortage of nutrition diversity, shortage of capital, lack of agricultural extension services, high price of farm inputs and lack of access to improved technologies were major problems faced by poor women in the area.

Even though women play a major role in family management including food provision, their activities were limited to selling firewood, and working as daily laborers to supplement PSNP's support to meet their family food consumption needs. Most of them are resource poor women, unable to manage farm level activities like crop production due to limited capacity and shortage of labor.

### The Intervention

In response to these challenges, BENEFIT-REALISE Oda Bultum University cluster started demonstrating improved chicken breed (red bovine) with the objective of creating income generating opportunities and improving nutrition diversity in women headed households.

The breed, the intervention area and the beneficiaries were selected in close collaboration with woreda agriculture officials and zonal stakeholders. The breed was selected based on its adaptability to the environment and productivity. The intervention areas selected were from Oda Bultum, Habro, Chiro and Doba woredas. Ten women farmers were selected from each kebele reaching a total of 40 women households.

Two hundred, three months old red bovine chicken breeds (5 for each woman) were distributed following training on chicken management and feed preparation at Oda Bultum University by professionals from the University and zonal livestock and fishery resource management office. DAs, woreda focal persons and kebele level animal health experts responsible to support beneficiaries at the local level were included in the training. While the project ensured each beneficiary's responsibility to prepare their own chicken feed from locally available

inputs at home, one-month starter formulated feed was provided at start-up.

### **The Change Case**

Hindi Ahmed one of the beneficiaries of the project explained the performance of the chicken as follows.

Hindi said, "I like the breed. The chickens are like lactating cows that do not dry up. They give eggs daily if managed well and appropriate feeding is given to them. We have started consuming eggs at home, improving the nutrition status of my family, especially my children. On average I get 5 eggs per day, use 2 for home consumption and sell 3 eggs, earning an average of 12 Birr per day. I buy consumable goods with the money and also use it for other family expenses.

I would like to add more chickens by saving some of the money I am earning and others in the area are also interested to start a business but getting the same breed is not easy, and we need outside support to link us with the right supplier."



The project provided improved chicken breeds, training and support to women farmers can bring livelihood changes at household level in terms of income and dietary diversity. The chicken are performing well in all kebeles and women farmers are highly impressed with the breed's adaptability and productivity compared to previous chicken types in the area.

## Building the Resilience of Women through Small Ruminant Fattening

### The Context

The Eastern Amhara Region is one of the food insecure areas of the region, and hence, relies on food aids and safety net support. It is the area where poverty and food insecurity are big challenges. Lack of ox, initial capital for low asset groups, and control over land use by women were some of the critical problems identified in our PRA study.

### The Intervention

Accordingly, BENEFIT-REALISE Woldia University cluster interventions focused on building the resilience of women through "Small scale small ruminant fattening business." Small ruminants play important roles in rural communities by improving the livelihood of resource-challenged farmers. Apart from contributing to human nutrition in the form of meat, they are also used as an income buffer to the risks associated with erratic climatic changes. The pilot was implemented in two woredas namely Wadila and Habru of North Wollo Zone. A total of 16 PSNP disadvantaged women participated in the initiative.

In October 2019, the project provided sheep, feed through credit and a one-day training on small ruminant fattening techniques. The intervention was implemented with small initial investment and full involvement of beneficiaries in terms of business idea generation, labor, material and financial contribution. In addition, skill of business management and regular technical and moral support was provided by the project and kebele livestock experts to ensure sustainable change.

### The Change Case



"I want everyone to know that women can indeed perform well and improve their livelihood, if given the opportunity."

Kidist Ayenachew, a 34-year-old mother of 4 children, is one of the 16 women selected to participate in small scale small ruminant fattening business project in October 2019 in Wadila Woreda, Hamusit Kebele. Prior to the project Kidist made her livelihood mainly as a casual laborer and by harvesting wheat and other cereals from her parents' small farm land. But the income she earned was not enough to meet the basic needs of her family.

Kidist said, "As a landless, unskilled and economically vulnerable woman, it was difficult to raise 4 children on my own. I did not have the capacity to participate in community events and was looked down by my neighbors. I was always struggling searching for mechanisms to improve my life. In 2019, the project provided 16 women with 5 male sheep & two months concentrate/feed each through the credit system via RUSACCOs (a rural saving and credit cooperative) and a one-day skill training on small ruminant fattening techniques. In three cycles (9 months), I earned a net profit of 16,650.00B birr. After covering fattening operational costs, paid a portion of my loan, and expenses related to family food, clothing, medication, school materials for my 3 children, as of September 2020, I have more than 3000.00 birr in my savings account. I also bought house utensils, chairs and kitchen cabinets with 4,570.00 birr. I plan to increase the number of small ruminants for fattening from 5 sheep to at least 10 to 12 in the coming 3 to 4 months.

Since the project, my life has improved dramatically. We used to eat twice a day, now, not only do we eat three times a day but our diet has diversified. During holidays, 3 to 4 times a year, we slaughter one of our sheep for meat. I am not afraid of bad times to come since I have enough saved to recover, if needed. And each and every progress, success and stepping-up you see happened because of the fattening business I started."

The amount of loan Kidist borrowed was 8,250.00 birr to be paid back within two years in four phases (every 6 months). The money was directly used to buy 5 local breed male sheep for fattening purposes. Kidist has already repaid half of the loan which is 4,125.00 birr to the RUSACCOs.



## Dairy Goats Improving Livelihoods

### The Context

In Raya Azebo woreda, most households are PSNP beneficiaries with low asset ownership and vulnerable to environmental shocks, especially the Female Headed Households (FHHs). The DDS (Dietary Diversity scores) is low compared to Male Headed Households (MHHs). The consumption of livestock products is limited and their health and nutrition status low.

### The Intervention

In December 2018, to improve the livelihoods of the households thereby enhancing their resilience to shocks and risks, BENEFIT-REALISE Mekelle University cluster started implementing dairy goat intervention with multiple benefits such as enhancing asset ownership and milk consumption. This intervention was selected since small ruminants are also easily manageable.

During the intervention, stakeholders such as Bureau of Agriculture, development agents, BENEFIT-CASCADE, Tigray Agriculture Research Institute (TARI), EIAR-Mekoni ARC, PSNP and Kebele administration were engaged in participant selection, training, vaccination, follow-ups and experience sharing. 35 women were included in the intervention.

### The change Case

Keria Yasin is 45 years old. she lives in Werabayu Kebele, Raya Azebo Woreda. She said, "I was selected to be among the 35 women selected since I was in a desperate situation because of my HIV

status and everyone knows I am a hard working person in spite of my situation. In 2018, BENEFIT-REALISE Mekelle University cluster experts gave me 2 Does (Female goats) and 1 buck male goat at the nearby farmers training center. The distribution was made using the lottery method. The goats were tagged and the selected households picked the coiled tags randomly. This is mainly done to avoid bias during the distribution process.

I have always dreamed of having such goats with good body condition. The first few months were really good since we were given forage seed. But then we had to depend on the cut and carry system, and since the goats are heavy feeders, that was labor intensive.

In spite of that and a couple of termination of pregnancy due to the transportations and health problems, now I have eight goats with the value of almost thirty thousand birr in two years.

Since I was more focused on the goats I did not use the goat milk for myself but left it to the off springs.

If you work hard and manage them well, dairy goats are highly profitable. The price for one goat can run up to 2500 Birr. That is why I value what I have right now upto 30,000 Birr. One time buyers approached me to sell a single goat for 8000 Birr (eight thousand Birr), but I refused, since I know the value of the breed. But I am ready to refund the two does and one buck that was provided to me per the agreement, so that others can benefit also."

## Environmental Sustainability

The following interventions focus on introducing eco-friendly and cost-effective technologies for increased agricultural productivity



# Vermicompost Demonstration: Reduce Fertilizer Cost, Increase Soil Fertility and Crop Productivity

## The Context

Soil fertility is a big challenge that affects the productivity of farmers. The trend in increasing price of chemical fertilizer is compounding the issue especially for food insecure farmers in the rural area struggling to make ends meet.

## The Intervention

To address the challenge, BENEFIT-REALISE Bahir Dar University cluster introduced Vermicompost technology demonstration. Vermicomposting is the process of using earthworms in preparation of enriched compost. It is one of the simplest methods to recycle agricultural wastes to produce quality compost. Earthworm acts as a physical aerator, crusher and mixer, chemically a degrader and biologically a stimulator in the process of decomposition. The worms consume biomass (decaying organic matter) and excrete it in a digested form called as worm casts or worm manure that are rich in essential plant nutrients, plant growth promoting substances, and beneficial soil micro flora and have properties of inhibiting pathogenic microbes. As a result, the organic end products produced by the earthworms i.e. vermicompost also inherits most of the beneficial properties to soil health and crop productivity. Vermicompost acts as an organic soil amendment and improves three-dimensional soil health's namely physical, chemical and biological properties. On application of vermicompost, it enhances the soil quality by improving its physicochemical and biological properties.

The project transferred skill and knowledge on how to care and multiply the worms, how to harvest the

compost and its application in the farm plots. The project was implemented in collaboration with Adet Agricultural Research Center and Libokemkem Woreda Agriculture office. Practical training, a leaflet on vermicomposting, worms and improved maize seed were provided to participating farmers by BENEFIT-REALISE. Adet Agricultural Research Center collaborated as the source of technology and trained farmers and Development Agents. With the follow up of woreda and kebele agricultural offices, farmers-built worm houses to safeguard the worms from chickens, birds and rodents attack. This activity was implemented in Dabat, Lay Gayint and Libokemkem woredas. A total of 60 PSNP beneficiary farmers participated, out of which 18 were female headed households.

## The Change Case

Assefa Worku, a 28-year-old farmer lives in Libokemkem woreda Shabo kebele. As a head of a family with four members, he makes his living by farming on rented land. He has been a PSNP beneficiary for the past four years. In 2019/20 he was one of the 10 participants selected for vermicompost demonstration by BENEFIT-REALISE.

Assefa said "Every year, I have difficulty feeding my family for at up to four months. I have to go looking for income working as a daily laborer and use what I receive from PSNP cash for work. In 2019/20 I received training on how to use worms to make compost. I received 1 kg of vermi worm as well as improved maize seed by BENEFIT BENEFIT-REALISE Bahir Dar University cluster. I planted the seed on 0.125has of land, and harvested four quintals of maize which will enable me to feed my family. Unlike the other seasons this time I saved ETB 750 which I would have spent for fertilizer and seed.

I am interested in intensifying the multiplication of the worms to cover my fertilizer needs for the future and make money from the sale of worms to fellow farmers since most have seen the benefit and there is high demand. I am thankful for the opportunity and I am sure I can make a big difference in my livelihood if such practices are introduced regularly.



Maritu Ayalew, 55, is a PSNP beneficiary female-headed household with three family members in Libokemkem woreda Shamo kebele. In 2019/20 she is one of the beneficiaries of the vermicompost demonstration by the BENEFIT-REALISE program. She said, "I planted the improved seed provided to us based on the training provided and with close follow-up from the kebele development agents and the program experts. This year I harvested about five quintals of maize from 0.125ha which is a record high in my farming experience so far. I plan to use the technology on my other plots in the future to obtain more yield and save the cost of fertilizer. I also shared the worms with my relatives and neighbors. From this cropping season, I saved about ETB 700 and plan to use it to start poultry production.



*Intercropping of maize and bean at early growth stage (left: Jemal Dardegba's field) and Jemal Dardegba, a farmer in Silte woreda, in front of his maize-haricot bean intercropping field (right)*

## **Intercropping Economical, Nutritional and Environmental benefit**

### **The Context**

Shortage of food and low dietary diversity are the major challenges of PSNP households in Southern Ethiopia. Households face food gaps of 3-7 months per year, and even when food is available, the nutrition is not well balanced as it often lacks sources of protein and vitamin rich foods. Since 2018, the Hawassa University cluster has been engaged in selection, validation and introduction of best fit agricultural practices that are suitable to the different agroecological and socioeconomic settings of the target woredas and that address both these production and nutrition problems.

### **The Intervention**

Intercropping is considered as one of crop intensification strategies that has the potential to increase agricultural productivity per unit area of land. It is most effective when compatible combinations of leguminous crops and cereals are used.

Intercropping of maize with haricot bean, has various economic and ecological benefits: Economically, the total productivity from the two crops that are grown simultaneously on the same piece of land, is higher than the sole-cropping practice of the individual crops calculated in terms of total grain yield or monetary value. The presence of a legume (haricot bean) in the cropping systems improves nutritional security of households and contributes to improved soil fertility and reduces the cost of fertilizers, reduces the emergence of weeds and thus the cost of weeding. In addition to its contribution to increased total productivity of land, haricot bean fills the food gap months since it reaches maturity earlier than maize.

BENEFIT-REALISE Hawassa University cluster, with active participation of farmers and the woreda offices of agriculture, implemented demonstration and pre-scaling of intercropping of maize with haricot bean. The varieties selected for this purpose were, BH-546 for maize and Hawassa dume for haricot bean. The selection was based on adaptability of the varieties to the sites and also their compatibility. In 2019, the cluster demonstrated maize-haricot bean intercropping on 80 farms and 8 FTCs, in 8 kebeles from Halaba, Shashogo and Silte woredas. Farmers who were involved in the demonstration trails were provided with inputs (seed and fertilizers) and training to implement the demonstrations.

Yield data collected from the demonstration trials of 2019 showed that productivity was 2-3 times higher

than the farmers' common practices of monocropping. The average yield obtained from intercropping fields of the sample farms was 76.1 quintals ha<sup>-1</sup> of maize and 26.6 quintals of haricot bean ha<sup>-1</sup>, making up a total of 102.7 quintals ha<sup>-1</sup>. The intercropping yield was also compared with sole crop of the same varieties of maize and bean grown at the same sites and under the same management. The result indicated that the yield obtained from one hectare of intercropping field would have taken 1.85 hectares, if the two crops were grown as a sole crop. This clearly demonstrated the potential of intercropping to maximize yield from a unit area of land. Due to excellent performance of the technology in the demonstration trials and farmers' interest in 2019, the project, in collaboration with the beans for all woredas was 64.2qts maize and 18qts haricot bean, a total of 82.2qts per hectare. This yield is about twice the amount that is obtained from the common farmers' practice. The highest yield was recorded in Silte woreda, with mean grain yield of 84.4qts maize and 18qts haricot bean, total 102.2qts; It was achieved mainly due to the good soil conditions and proper use of fertilizers.

### **The Change Case**

The story of Jemal Dardegba is one good example that shows properly managed intercropping practice of maize and bean has the potential to significantly improve food and nutritional security in the mid highlands.

Jemal Dardegba is a 45-year-old farmer from Doboenseno kebele of Silte woreda. His household has seven family members.

Jemal said, "I was given inputs (seed of maize and haricot bean) and trained by BENEFIT-REALISE experts to implement intercropping on my 0.125 hectare of land. To maximize yield benefits I applied

12.5kg NPS (100 kg/ha) and 25kg Urea (200kg per/ha) fertilizers, as per the recommendations. Between the periods of planting to harvesting, I took very good care of the crops. I was assisted by the kebele extension agent.

At harvest, I obtained 13.5 qt of maize and 4 qt of haricot bean from 0.125 ha. I used a popular hybrid maize variety named *Shone* on a plot that is adjacent to the maize bean intercropping. We compared the yield from the two fields and the maize yield in intercropping was 20% higher than the sole cropped *Shone* variety, even without including the yield of haricot bean.

The yield I got from maize as well as haricot bean is very high. I have never harvested even half of this amount from this small plot of land. I plan to use half of the produce for home consumption and sell the rest. The income I get from selling maize will be used to buy a small water pump for irrigation purposes. With access to irrigation water, I can produce vegetables 2-3 times a year mainly for the market, but also for home consumption. I will continue to produce maize and beans in intercropping systems for home consumption".

Jemal added, "Since I have acquired knowledge and skills to effectively handle maize-bean intercropping practice and maximize yield from my small plot of land, I can improve food availability and income of my family, and improve our livelihood in general. I have learned that the solutions to our problems are within our reach, but we don't see them until somebody shows it to us. We should open our mind to use new agricultural technologies and we should work hard to get out of poverty. I am grateful for this opportunity that showed me how to harvest more from my small plot and improve the livelihood of my family in general".

**For more information please contact**

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