



Bridging the dairy feed gap

Improved forage production by smallholders in Ethiopia

SNV-EDGET
Practice Brief 2
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The demand for milk products far outstrips supply in urban and peri-urban areas of Ethiopia, making milk production an attractive livelihood option for many smallholder farmers. Rising demand is driven by a combination of factors including population growth, urbanisation and increased awareness of the nutritional benefits of milk. The steady economic growth in the country over the past decade has also contributed to a growing middle class with a higher disposable income.

Despite these positive trends, a combination of supply- and demand-side challenges continue to hamper the further growth of the dairy sector. On the production side, the mixed farming systems practiced by most smallholders are characterised by low productivity of dairy animals and limited access to high quality livestock feed. Dairy farmers currently spend up to 60% of their production costs on (often poor quality) livestock feed.

- Over the past few decades many stakeholders in the dairy sector — including government affiliated livestock development projects, research institutes and non-governmental organisations (NGOs) — have attempted to respond to the livestock feed gap by investing in improved forage crops and pastures. However, despite the successful propagation of forage crops at research stations and a few private commercial farms, adoption at the smallholder level has remained elusive.

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Moreover, with a rising population, increased urbanisation and the expansion of industries around urban and peri-urban areas, the demand for food crops has reduced the availability of grazing land, which is the main source of livestock feed. Alternative sources of livestock feed such as crop residues, natural pasture and agro-industrial by products are insufficient, and/or do not provide the required nutritional value for intensive dairy production.

These constraints are among the reasons why the Enhancing Dairy Sector Growth in Ethiopia (EDGET) project, implemented by SNV-Netherlands Development Organisation, set out to explore cost-effective solutions for farmers.

What did EDGET do?

An assessment of the development potential of major Ethiopian milk sheds (Wageningen University, 2013) identified a number of factors that lead to the low uptake of forage development by smallholder farmers. They include limited extension support for farmers to enable them to produce improved forage, and the lack of reliable access to good quality forage seeds and planting material.

The Government of Ethiopia has made major investments to roll out artificial insemination (AI) services to upgrade the current dairy cattle stock. This has created a high demand for appropriate technologies and skills to support smallholders to utilise their small plots of land (1.5 hectares on average) as efficiently as possible. Farmers need to produce high quality livestock feed while also continuing to grow sufficient food and other cash crops. The EDGET project therefore aimed to integrate forage production within the existing mixed farming system.

The improved forage intervention consisted of a number of key steps:

Identifying suitable forage types

SNV-EDGET started with a comprehensive review of improved forage crops that are well suited to the agro-climatic situations in the three regions (Oromia, Amhara and SNNPR). The review included analysing research findings and project experiences in order to understand the best available techniques on backyard and field forage cultivation. Various adaptable and sustainable

techniques were considered, including backyard production, intercropping and under-sowing. Such intensive techniques enable farmers to make the most efficient use of small plots of land and ensure that food production is not compromised.

Assessing farmers' needs and seed sources

The next step was to investigate available sources of forage seed and planting materials among government and research institutions as well as private suppliers. The EDGET assessment revealed that the existing supply of forage seeds and planting material is inadequate to meet farmers' needs.

Based on the findings, one of objectives of the project was to explore sustainable market-side solutions to encourage farmers to intensify their production system. The project aimed to build a network of reputable private agro-input dealers, commercial farmers and government supported seed multiplication and demonstration sites in

order to meet the expected rise in demand. The project further sought to establish or strengthen forage seed grower groups and build their capacity to supply high quality seeds for the local market.



Figure 1: Types of forage crops that are suitable for backyard and field pasture production

Altitude	Tree Legumes	Herbaceous Legumes	Grasses
<2000 m	Leucaena Sesbania Pigeon pea	Desmodium (Greenleaf & Silverleaf) Alfalfa Lablab Cowpea	Rhodes Grass Elephant Grass Panicum Setaria
2000-2400 m	Sesbania Pigeon pea Tree lucerne	Alfalfa Vetch	Phalaris Elephant Grass Oats
>2400 m	Tree Lucerne	Alfalfa Vetch	Phalaris Oats

Given the poorly developed local seed supply market, EDGET opted to start by distributing forage seeds and planting material to farmers free of charge. The aim was to quickly demonstrate the importance of high quality forage in improving dairy productivity and farmers' income. It was expected that farmers would then have an incentive to continue to multiply seed, or to buy these inputs on the local market.

The experiences of "first generation" farmers supported by the project (see farmer stories on pages 4-5) confirm that farmers who have successfully established forage plots are highly motivated to continue to scale up their production.

The EDGET Project

Enhancing Dairy Sector Growth in Ethiopia (EDGET) is a five-year dairy development project implemented in 51 woredas (districts) in the three regional states of Oromia, Amhara, and the Southern Nations, Nationalities and Peoples' Region (SNNPR). The overall goal of the project is to contribute to enhance the livelihood of 65,000 smallholder farmer households through improved dairy production and marketing. The specific goals of the project are to: (i) to double the income of smallholder households from dairy production, and (ii) improve the nutritional status of children, particularly in the first 1,000 days of their lives, through consumption of milk products.

EDGET also seeks to complement the significant investments made by the Government of Ethiopia to promote the contribution of the dairy sector to the country's economic development.

EDGET is implemented by SNV-Netherlands Development Organisation, Ethiopia, and funded by the Embassy of the Kingdom of the Netherlands. It builds on the work of previous Dutch-funded dairy sector programmes, including the Business Organisations and Access to Markets (BOAM) programme (2005-2011) and the Market-linked Innovation for Dairy Development (MIDD) programme (2011-2012).

For more information, please visit the project website at: www.snv.org/project/enhancing-dairy-sector-growth-ethiopia

Providing training and extension support

To address the lack of sustainable extension support, the project developed practical training packages aimed at providing useful information and motivating dairy farmers to allocate land for improved forage cultivation. The packages cover such topics as optimal land preparation, seeding rate, sowing techniques, fertiliser application and how to prepare livestock feed using forage. Through the network of Dairy Farmers Extension Groups established by the project, EDGET facilitated training and coaching sessions on improved forage cultivation at the village level.

Once the forage plots were established, EDGET dairy extension promoters continued to make regular field visits to monitor progress and provide follow up support. The visits were organised in collaboration with government extension workers at woreda (district) and kebele (village) level. According to EDGET monitoring and evaluation data, 30,213 households received training and extension support in the first year of implementation (2014). This number rose to 56,107 households in 2015 and 54,681 in 2016.

The project continues to facilitate regular farmers' field days and capacity building support for lead farmers to encourage farmer-to-farmer exchange and learning.

Supplying seeds and planting materials

EDGET provided members of the Dairy Farmer Extension Groups with an initial supply of forage seeds and planting materials (cuttings and splits) to plant on their backyards.

Between 2014 and 2016, the EDGET project supplied a total of 4,060 quintal (about 40 metric tons) of forage seed and 21.8 million pieces of planting material to farmers. Project data show that a total of 52,000 dairy households benefited from forage input support by 2016.

Farmer-friendly training materials on forage production

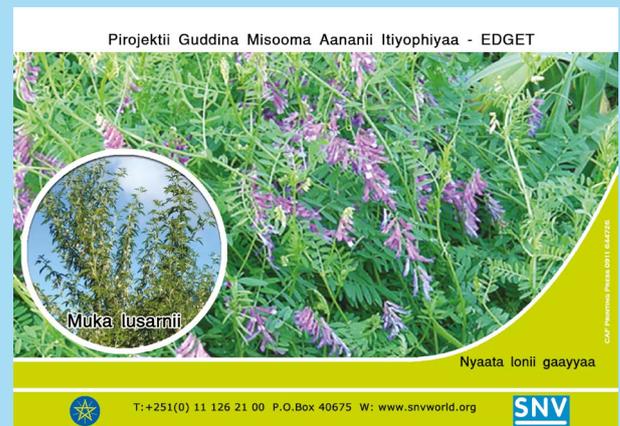
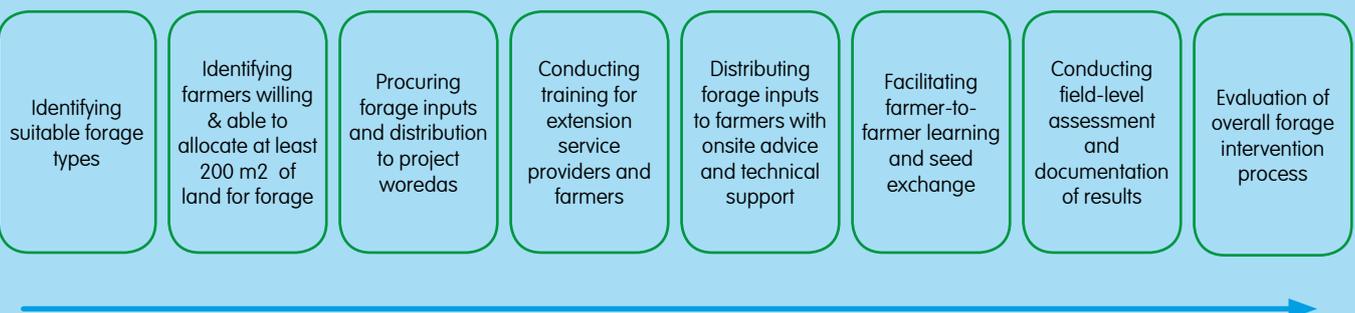


Figure 2: Trajectory of SNV-EDGET forage development intervention



“Desho grass has become my life”

Husen Beriso is a 60-year old farmer in Arsi Tiyo woreda, Oromia region. After attending a training session organised by the EDGET project he planted his first desho grass “splits” in 2014. In the following year he expanded his forage plot, adding oat and vetch planting material provided by the EDGET project.

Husen harvests desho grass three to four times a year, using the final harvest to make hay for the dry season. With a more reliable source of dairy feed, his daily milk production has increased from six to ten litres.

“Desho grass has become my life!” he exclaimed, during a farm visit by local extension advisers. Sharing some of his observations on forage management, Husen explained that desho planted using “splits” becomes better established compared to grass planted by seed. Second, once properly established, desho grass is drought resistant, and he has also noticed that it is highly resistant to weeds and is naturally palatable for livestock.

“If I continue to be blessed with good health, I will dig small holes to collect water during the rainy season,” he says. This will help him to maintain forage production during the dry season.

Husen’s family is well organized and shares the responsibilities for dairy management tasks. He continues to share his experience with other farmers and has provided planting material to four of his neighbours to start their own forage plots.

Husen’s parting words to his extension adviser are: “I wish long life to SNV!”

Story prepared by Tefera Lemi, SNV-EDGET Dairy Extension Promoter, Oromia

Forage production strengthens farmers’ resilience

North Shoa zone of Oromia region is one of the most important milk sheds in Ethiopia due to its proximity to Addis Ababa.

After attending a training organised by the EDGET project, Getu Negese allocated 1.5 hectares to plant a variety of grasses and forage tree species such as vetch, oats, desho grass, fodder beet, alfalfa and tree lucerne.

The benefits were immediately clear. “My cows began to produce more milk and for some cows I even got double the amount I was milking before. I have learnt that this is because there is a high amount of protein in improved forage,” Getu explains.

By growing a variety of forage crops, Getu can preserve part of his harvest by making hay. He has also built an improved shed to house his cows and calves. In 2016, Getu earned more than 100,000 ETB (around US\$ 4,400) from his dairy production and he has gained respect as a successful modern farmer. He is proud that his farming activities have ensured a better future for his children, who are now able to concentrate on their studies. “I even provided my two eldest children with 40,000 ETB to start their own business!” he says.

Through his Dairy Farmer Extension Group, Getu encourages other farmers to start multiplying and exchanging seeds so that they can sustain their production in the future. He is leading efforts to turn forage production into a viable business for the group.

Story prepared by Kassu Shiferaw, SNV-EDGET Dairy Extension Promoter, Oromia



Husen’s daughter feeds one of their dairy cows.

Elephant grass gets a new lease of life as a valued forage crop in SNNPR

Like many other rural households in Ethiopia, Shiferaw Germamo's family has always used mature stalks of elephant grass as a construction material.

Shiferaw and other members of his Dairy Farmer Extension Group in Hawassa Zuria woreda, SNNPR region, could not believe that the giant grass that they have known all lives – also known as napier grass – could provide a solution for their livestock feed problems.



Shiferaw carries freshly cut elephant grass to feed his cattle.

"I used to use crop residues such as maize straw and enset leaves, which I would mix with wheat bran from the market. But after attending the EDGET training I decided to plant improved elephant grass on my backyard plot." The farmers

value elephant grass for its resistance to drought and availability throughout the year. Elephant grass is also bulky, which means that just a small plot planted with the grass can produce much more feed compared to other grasses.

Shiferaw grows enough forage to supply all his livestock feed needs. He has added other improved forage crops such as desho, Guatemala grass and lablab and has learnt how to enrich the livestock feed with agricultural by-products.

Shiferaw is also making use of the increase livestock waste to fertilise his farm, which helps to reduce the cost of buying synthetic fertilisers.

Story prepared by Endale Tesfaye, SNV-EDGET Dairy Extension Promoter, SNNPR

Generating income for unemployed youth through forage seed multiplication

For many young people, earning a living through agriculture is a difficult undertaking. Having witnessed the difficulties that dairy farmers face in obtaining high quality livestock feed, one enterprising youth group from Yekayet kebele, Awabel woreda in Amhara region, is trying to turn this gap into an economic opportunity.

All 18 members of the group – 12 men and six women – worked as casual labourers as their families do not own land. They began their farming venture on one acre of land donated by the kebele administration. However, they were not able to make enough money from the crop they produced because of the poor quality of the soil. They did not have enough money to purchase inputs like basic seed, fertilisers and pesticides.

When EDGET began its intervention in the district in 2014, the Woreda Livestock Office introduced the group to project staff who trained them in making a business plan. The group decided to multiply alfalfa seed, sweet clover and oats, with EDGET providing initial seeds to cover half an acre of land. The group harvested one quintal (about 100 kg) of sweet clover and eight quintals of oats, which they sold for about 13,830 ETB in the first season. This earned them a profit for the first time. As one group member told the EDGET project staff, "...this is the right alternative for resource poor farmers like us. With the money we can help our families to pay for clothing and school fees."

While the youth group has a ready market for their forage seeds through a local dealer, the main challenge that they face is getting access to high quality alfalfa basic seed. Their dream is to continue to build their skills so that they can one day become certified seed producers in their own right.

Story prepared by Kassaye Temare, SNV-EDGET Dairy Extension Promoter, Amhara

Members of the youth group work on their forage plot.



Key results

Between 2014 and 2016 about 52,000 households (80% of the 5-year EDGET target) had developed forage plots with at least two different types of forage

Prior to the start of the EDGET project most smallholder dairy farmers in the three regions did not practice any (or very little) forage production.

As shown by the sample of farmers' stories featured in this Brief, this situation quickly changed once farmers realised that forage production offered a solution for their livestock feed needs, while also reducing their workload and boosting milk income.

By 2016, the average size of forage plots was 0.25 hectares.

Across the three regions, smallholder farmers supported by the project have established forage plots measuring a total of 12,500 hectares.

Farmers' demand for improved forage production is also evident in the way that they are experimenting with different forage types to increase the nutritive value of the feed supply. Most farmers use their backyards to produce forage plants such as desho grass, which have a high biomass yield for a unit of land. Land further afield is cultivated with productive pastures like Rhodes, oats, vetch, alfalfa and other legumes. Between 2014 and 2016 about 52,000 households (80% of the 5-year EDGET target) had developed forage plots with at least two different types of forage.

An added benefit for farmers is the savings made from not having to buy hay and additional feed supplements. Many farmers have started to earn a modest income from selling forage seeds and planting material to other farmers.

Lessons learnt

The EDGET project has made significant strides in raising awareness about the benefits of backyard forage production. As a result smallholder demand for forage seeds has grown substantially. These developments hold promise for the emergence of a strong domestic market in forage seeds, which is a key requirement for the further scaling up of smallholder dairy production.

In order to fully capture the potential of this emerging market and ensure the emergence of a strong and inclusive dairy value chain, a number of policy and operational constraints will need to be addressed.



Developing a market based forage seed supply system

Most actors in the livestock sector believe that smallholder farmers cannot afford to buy forage seeds. To some extent, this view reflects the general assessment that the sector has not reached a level whereby farmers can access forage seeds at competitive market prices. It is therefore argued that such critical inputs for smallholders should be provided for free or at a subsidised price.

As highlighted by the stories featured in this Brief, this assumption is not justified once the initial stock of forage seed has been introduced and farmers have realised the benefits of investing in improved forage. On the contrary, providing seeds for free undermines forage development interventions as it discourages motivated farmers from expanding their production to earn an income from seed and seedling multiplication. It also acts as a disincentive for the emergence of commercial seed producers who can ensure a steady supply of high quality seed.

Moreover seed production and marketing is dominated by a small number of private enterprises with a guaranteed market from NGOs and government departments offering seed for free. In the current environment, they can set very high prices for forage seeds. This contributes to a vicious cycle where farmers cannot buy seeds at a fair price, nor benefit from becoming seed producers.

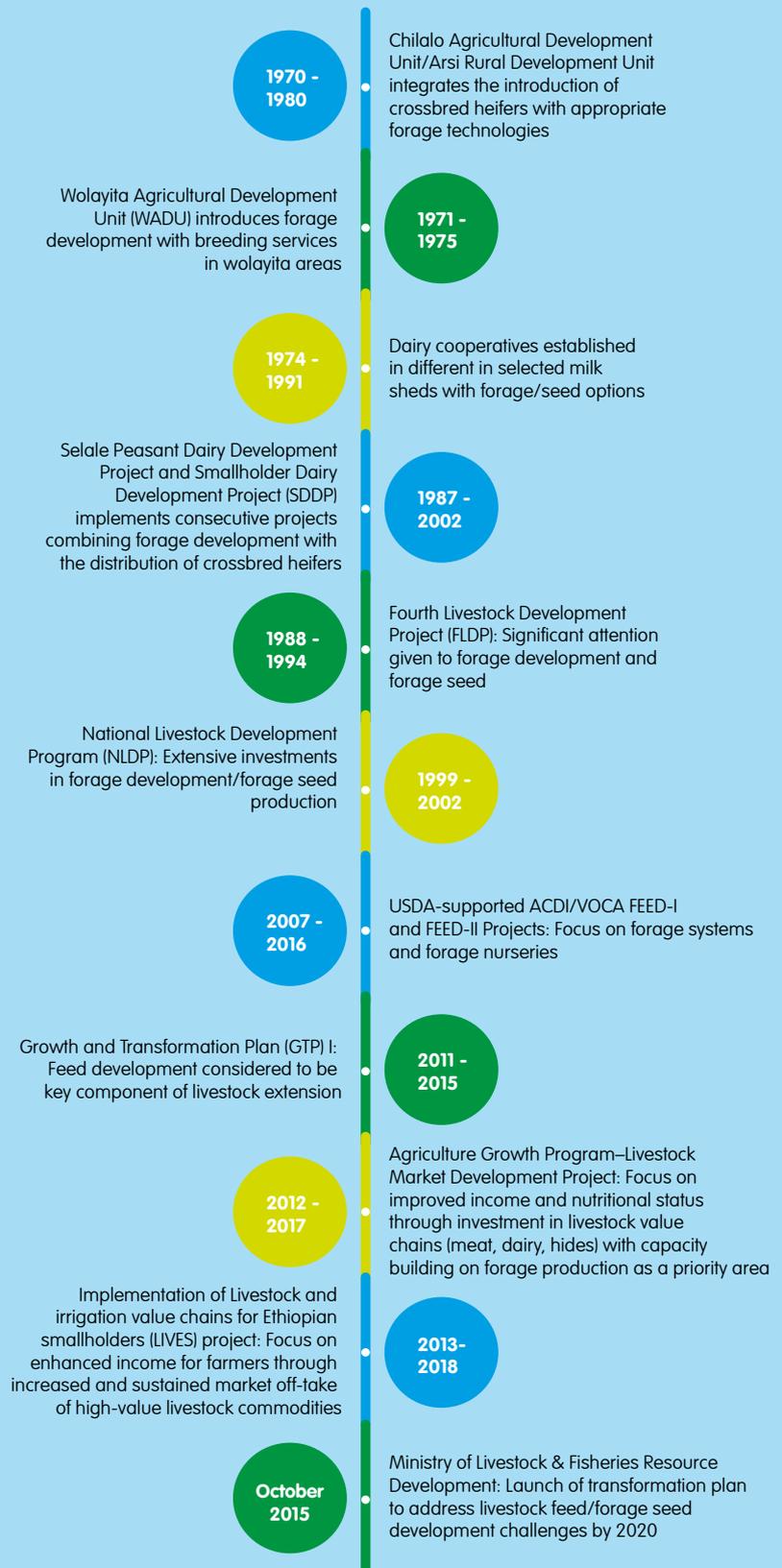
In EDGET's view, one of the lessons learnt is that the current situation will benefit neither smallholders nor commercial producers and suppliers. Given the multi-faceted nature of the forage seed supply problem, addressing it requires a multi-actor approach bringing together relevant government departments, research institutes, private sector actors, farmer organizations and development partners. Policy interventions from the relevant government authorities are also needed to send the right signals to the market.

Fine-tuning the extension approach

The use of the farmer-led model, through the Dairy Farmer Extension Groups, has proved to be a useful and cost-efficient approach for reaching large numbers of farmers.

A brief history of improved forage interventions in Ethiopia

Over the years, diverse stakeholders in the dairy sector have attempted to address the feed problem. This is an overview of some of the main initiatives to date.



EDGET's experience in piloting the forage development activities and cascade approach to build capacity within the extension system is the subject of a related practice brief (see list of all forthcoming practice briefs below).

With a project area spanning three regions of the country, the extension system needs to provide context-specific advice that is tailored to the different agro-ecological zones, land-use systems and market scenarios in which dairy smallholders operate. Besides training in pasture production, there is also need to introduce farmers to more integrated "sustainable intensification" farming methods. Techniques such as under-sowing and inter-cropping, for example, are more appropriate for smallholders with limited access to land.

As highlighted in the farmer stories featured in this Brief, farmers who already own several crossbred dairy cows are in a better position to earn an income from milk production. These farmers are also the earliest adopters of improved forage. The EDGET intervention therefore highlights the importance of focusing on early adopters with high potential to scale up their milk production. This will create a critical mass of smallholders with the capacity to invest in sustainable and non-subsidised forage production.

Building effective learning alliances

One of the main objectives of EDGET's forage development strategy is to ensure that all solutions to livestock feed constraints are "farmer-centred and developed with farmers."

The rapid uptake of improved forage by farmers in the three regions highlights the importance of providing farmers with the right tools to address the livestock feed gap.

In order to support smallholder farmers to build on these successes, it is important for support programmes such as EDGET to continually learn and adapt their approach. This is especially true with regard to identifying emerging challenges and finding innovative solutions to tackle more deep-rooted bottlenecks within the market or institutional environment.

This Practice Brief and other publications in the SNV-EDGET Learning Series are a first step in documenting some of the key insights we have gained so far. EDGET aims to use these insights as a starting point to bring together all the major stakeholders in the animal feed value chain – including the Ministry of Livestock & Fisheries Resource Development, agricultural research institutes, development NGOs and private companies – to jointly address the day-to-day challenges faced by smallholder dairy producers. In doing so, we can also draw on SNV's track record in value chain development and facilitating multi-stakeholder platforms.

Through this series, we also hope to add to the body of practice-based evidence that can inform and encourage more coordinated responses. In particular, there is urgent need for more cohesive approaches by research and extension services providers in the forage market chain.



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THE SNV-EDGET LEARNING SERIES

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A set of longer farmer stories is also available.

Once published, all publications in this series will be available online via the following link: www.snv.org/project/enhancing-dairy-sector-growth-ethiopia/

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