Supporting Ethiopia's dairy sector

A reflection on EDGET's experience

SNV-EDGET Practice Brief Synthesis June 2018

Between 2013 and 2017 the Enhancing Dairy Sector Growth in Ethiopia (EDGET) project managed by SNV-Netherlands Development Organisation provided support to nearly 65,000 smallholder dairy farming households in Ethiopia. The objective was to contribute to the upgrading of dairy production, processing and marketing, enabling these households to increase their income. The project was guided by a theory of change that was adjusted several times during implementation. In this paper, the EDGET Dairy Team reflects on this theory of change and answers questions such as: "what did we achieve?"; "what did, or did not, work out as we expected?"; "what should we have done differently?"; and "which of the lessons learnt will shape our approach for the next phase?"

EDGET's Theory of Change

When the EDGET project was formulated it was not yet standard practice for every project proposal to include a theory of change. Nonetheless, the project designers opted to base the five-year plan on a results chain (depicted in figure 1), formulate assumptions and make an assessment of possible risks. Together, these elements amount to a theory of change.

The EDGET project was based on the rationale that the potential for dairy production in Ethiopia is greatly underutilised. Although many farmers own dairy cows, these are predominantly local breeds that produce an average of one to three litres of milk a day. There is limited production and marketing of milk. In fact, Ethiopia is a net importer of dairy products. The Ethiopian government views this gap as an opportunity to create employment in the dairy sector, increase farmers' income and reduce the country's dependency of dairy imports. Simultaneously, the government strategy aims to improve food security and the nutritional status of children through increased dairy consumption.

Mazzican (or MTS) containers for milking and transportation were among technologies introduced by EDGET

In order to boost dairy production, the government planned to invest in upgrading dairy herds through the Mass Hormonal Synchronisation and Artificial Insemination Programme.

The EDGET project aimed to complement these efforts by introducing farmers to improved technologies and farm management practices and contributing to the upgrading of the dairy value chain.

The EDGET results chain provides an overview of the types of interrelated activities and outputs that were required in order to arrive at the expected outcomes and impact. At impact level, EDGET's goal was to double the income of 65,000 smallholder households through dairy farming. This goal required enhanced performance of key actors in a number of outcome areas:

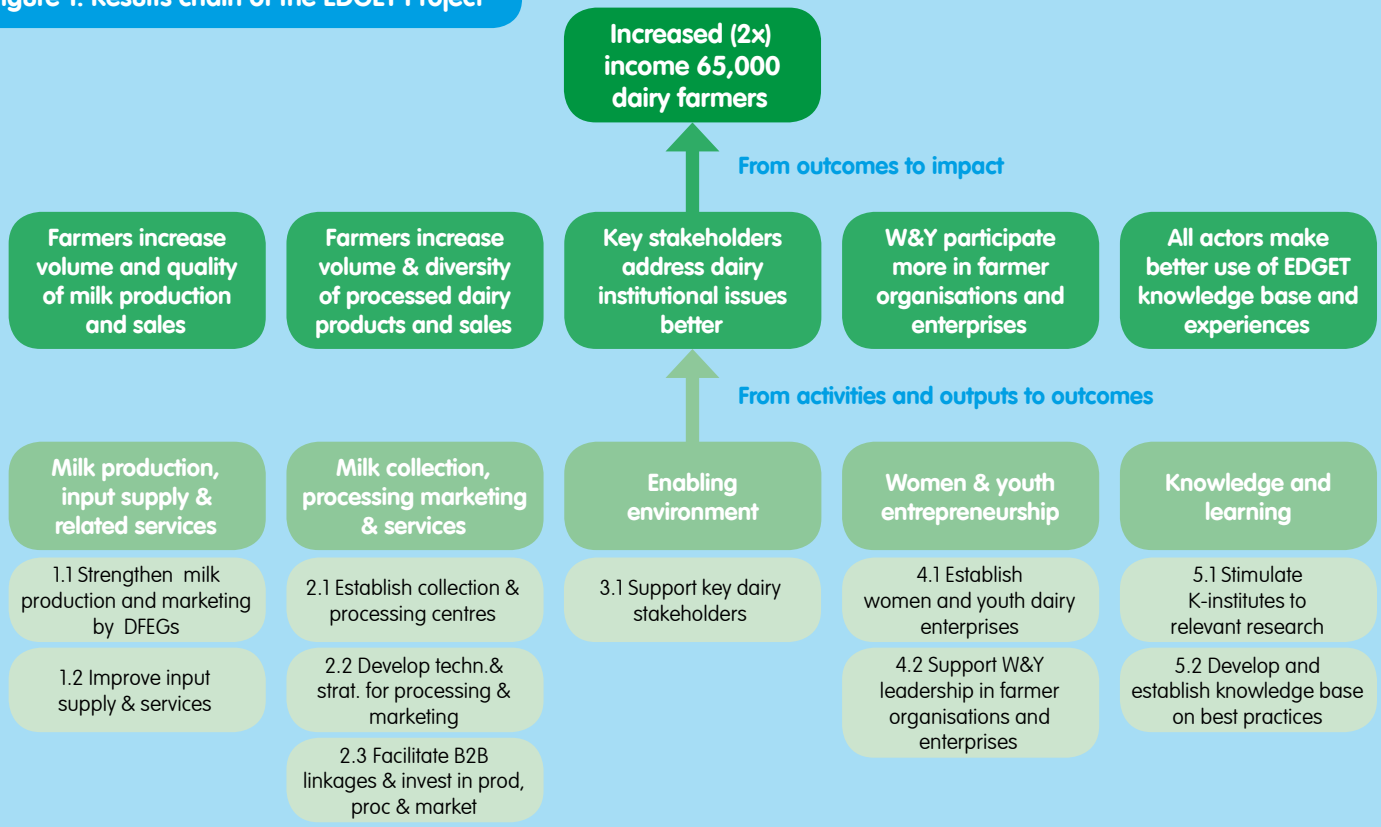
1. Farmers had to produce and sell more milk (Outcome 1a) and improve the quality of the milk (Outcome 1b).
2. Farmers had to produce and sell a larger volume and variety dairy products (Outcome 2).
3. Other key stakeholders, in particular government agencies, had to improve their performance in terms of creating an enabling environment for dairy farming (Outcome 3).
4. Women (Outcome 4a) and youth (Outcome 4b) had to participate more in farmer organisations and enterprises.
5. All actors had to make use of existing knowledge on dairy farming including the knowledge emanating from the EDGET project (Outcome 5).

In this Practice Brief we will look at impact and outcomes achieved and reflect on the effectiveness of EDGET's interventions. This synthesis builds on a series of eight Practice Briefs that offer insights and lessons from EDGET interventions across a number of key dairy sectors.

Enhancing Dairy Sector Growth in Ethiopia

SNV Netherlands Development Organisation

Figure 1: Results chain of the EDGET Project



The results chain consists of a hypothesis of the causal relationships linking activities, to outputs, outcomes and impact. The first results chain was revised in August 2013. This graph shows a simplified version of the revised result chain of 2013[1]. The results chain captures all the main building blocks of the EDGET project.

Assessing EDGET's impact

By December 2016, EDGET had reached out to 56,107 households through the extension component of the project. A survey of 383 households supported by the project showed that 89% had increased their milk production. For 23% of households reporting an increase, milk production had gone up by between 50 and 100%. Another 39% of households surveyed said milk production had increased by between 25 and 50%. Based on these findings, it was concluded that EDGET was on track to achieve significant results, despite the fact that most household production was based on local dairy breeds. The project's contribution to increased income from dairy is discussed in more detail in Practice Brief 1 of this series.

The end-of-project evaluation conducted in December 2017 further confirmed these encouraging findings. The qualitative analysis revealed that most interventions were highly relevant and effective. However, the evaluation was less conclusive about the achievements in quantitative terms, which was attributed to the poor quality of baseline data. Although milk production and net income from milk were found to be significantly higher than at the start of the project, the mixed quality of baseline data between the intervention and comparison woredas (districts) made it impossible to generate firm evidence that the observed changes were the result of EDGET's interventions. In the sections that follow, we will elaborate on the interventions for each outcome area and assess the extent to which they have contributed to the impact of the project.

Boosting the volume of milk production (Outcome 1a)

According the EDGET Dairy Team, the impact achieved by the project in terms of increased income can be directly linked to the project's intervention in this first outcome area, especially through the project's support for increased dairy productivity (milk volume) and sales of raw milk. These actions included:

- The provision of quality extension services to smallholder dairy farmers to improve dairy management practices (see Practice Brief 4 in this series).
- The provision of improved dairy inputs through strengthening the input supply system, including feeds, seeds, planting materials and AI-services (see Practice Briefs 2, 3 and 7 in this series).

[1] The early result chains also consisted of a component that focused on improving the nutritional status of 500,000 children. In 2016 the Project Board advised that the project should primarily focus on increasing the income of 65.000 dairy farmers.

Strengthening capacity of the public extension system

The introduction of improved forage and improved calf feed are proven practices for boosting milk production. EDGET's main innovation was its unprecedented scale in the Ethiopian context. As discussed in Practice Brief 4 in this series, EDGET was able to meet its objective of reaching out to 65,000 dairy farmers in a relatively short time because it built on the existing public extension system. Rather than establish a parallel service, EDGET focused on developing the capacity of 1,500 public extension agents, including senior staff at zonal and regional livestock officers, and Development Agents (DAs) working at the kebele (village) level.

Close working relationships between EDGET staff and the key government agencies at all levels was instrumental in making this intervention a success. EDGET used a variety of capacity building tools, including: developing a set of farmer extension materials in two local languages; developing manuals and guidelines for extension agents; and introducing peer to peer learning through a network of hundreds of Dairy Farmer Extension Groups and lead farmers.

As explained in more detail in the accompanying Practice Brief, a number of factors contributed to the success of EDGET's extension approach:

- It was cost efficient: By working through a system of Dairy Farmer Extension Groups, each comprising around 25 farmers with five lead farmers, farmers themselves could take an active role in disseminating knowledge and skills. The lead farmers provided practical training and coaching to their peers and their farms were used for practical demonstrations of improved dairy management practices. In addition to the proven benefits of peer to peer learning, there was no need for investing in model farms.
- It was practical and effective: Training and coaching of extension agents was effective because it was based on real needs identified by farmers and built around a real intervention. Such practice-oriented training leads to a much better uptake of knowledge and skills than the - still rather common - theoretical training approaches. Moreover, the project developed tailor-made extension packages for farmers in their own language. For many farmers, this was the first time they had received extension materials for their own use.

A training session for extension agents on techniques for improving dairy feed

- It was carefully targeted and monitored: EDGET ensured that only farmers meeting a set of basic criteria were selected for support. The objective was to work with farmers that had potential to scale up their production and sell milk and milk products on the market. Furthermore, the project carefully monitored performance at the farm level. Inputs, including seeds, planting materials and dairy feed, were measured and supplied in quantities that matched the herd size and capacity of each farmer.

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

The 2017 evaluation concluded EDGET's extension approach has strong potential to contribute to systemic and sustainable change. Among other results, the evaluation found that:

- 68% of intervention farmers (both male and female-headed households) participated in at least one dairy-related training or exposure visit activity, compared to 11% of comparison farmers.
- 47% of intervention farmers received advice and follow-up support compared to 6% of comparison households.
- The majority of farmers cited either EDGET Dairy Extension Promoters or public Development Agents as their key source for advice (at 78% and 21% respectively).
- The adoption rate of inputs and practices was also found to be significantly higher among farmers in the intervention group than the comparison group, which suggest that EDGET's peer learning approach was effective.

Strengthening the input supply system

For dairy farmers to increase their productivity they need access to both knowledge and dairy inputs such as artificial insemination (AI) services, forage seeds and planting material, and special feed for calves. It is for this reason that, in parallel to developing the capacity of the public extension system, EDGET invested in a sustainable input supply chain. This had to be done in stages. Initially, EDGET organised the supply of inputs to the famers, buying forage seeds and other inputs directly from suppliers and delivering them to farmers for free through the public extension system. In order to transition towards a more sustainable supply chain, EDGET initiated collaboration with a network of 50 agro-input dealers, based at woreda level, from 2015 onwards. In exchange for EDGET support the agro-input dealers committed themselves to supplying the dairy farmers with inputs such as special calf and cow feed formulas, Milk Transportation System (MTS, or Mazzican) containers, and forage seeds. This market-oriented approach was based on the view that the input supply should be fully integrated in the dairy value chain as it is more likely to be sustained once the project ends.

According to the final evaluation the network of agro-input dealers developed by the project offers a promising distribution channel for dairy-related products. The dealers were found to offer better quality inputs at a more affordable price than other traders and their businesses were growing. The support provided by EDGET was rated highly by the agro-input dealers themselves, especially with regard to facilitating the establishment of business-to-business (B2B) linkages.

Results linked to the strengthened input supply system include:

- 33% of the intervention farmers reported receiving forage seed compared to 13.9% of comparison farmers.
- 32% reported receiving calf feed, compared to 8% of comparison farmers.
- As a result of improved calf feed the age at which female calves were ready for their 1st AI service had reduced from 24-36 months to 14-18 months

However, building a sustainable input supply chain requires working with a broader range of dairy actors. EDGET therefore operated as a catalyst to accelerate the establishment of B2B linkages among a broad range of market actors, including farmers' organisations, agro-input dealers, manufacturers and suppliers of agricultural equipment, seeds and other farm inputs. By organising regular B2B events at the national level, EDGET contributed to networking and the emergence of business relations that are vital for the continued upgrading of the overall dairy value chain.

Improving the quality of milk (Outcome 1 b)

Another key contribution made by the EDGET project was the introduction of Mazzican, a durable 10 litre food-grade plastic container designed in such a way that it can be used for milking (due its wide opening at the top), as well as for milk storage and transportation. Compared to traditional methods, Mazzican reduces spillage and the risks of contamination[2]. By mid-2017, EDGET had distributed 95,000 MTS cans and 64.4% of the intervention farmers reported having a container (compared to 0.6% of comparison farmers).

EDGET invested in high quality dairy processing equipment for cooperatives

However, as explained in Practice Brief 8 of this series, the Mazzican intervention has, so far, not made a significant contribution to EDGET's overall goal of increased income from dairy farming.

[2] Kurwijila et al 2016, "The Efficacy of the Mazzican for Milking, Transportation and Improving Bacteriological Quality of Milk in the Smallholder Dairy Value Chain in Tanzania", CGIAR Research Program on Livestock and Fish

This is because farmers do not currently earn more for milk produced and transported using Mazzican. A key reason for this is that traders, processors and consumers do not have to pay more for better quality raw milk since milk is not regularly tested, nor are government hygiene regulations systematically enforced. This could explain the findings of an EDGET survey of farmers' willingness to pay for a Mazzican. The study found that only 30% of 53 farmers surveyed were willing to pay around one-third of the market price (between ETB 100 and 200), while no farmer was willing to pay the full market price (estimated at around ETB 350, or around US$7 at 2016 exchange rates).

By the same token, one can expect that a market for Mazzican could emerge if incentives to produce and market deliver higher quality milk are introduced. These could include more systematic enforcement of hygiene standards and the use of quality-based payment systems by processors and cooperatives.

Milk processing and product diversification (Outcome 2)

This outcome was based on the assumption that EDGET would support 65,000 farmers to aggregate their milk for the market. Across the three project regions, EDGET aimed to support farmers to organise themselves into around 2,600 milk collection groups that in turn would be linked to 520 milk collection centres and dairy cooperatives for processing and sale.

In line with EDGET's results chain, the expectation was that increased milk processing and diversification would follow once increased milk volumes (Outcome 1a) had been achieved. In reality, this progression did not happen as anticipated. In most project areas, milk production volumes have remained relatively low while the price for fresh milk continues to rise. Hence, despite rising milk demand, especially in urban areas, the conditions are not very favourable for farmers to invest in processing and other value-addition activities. This conclusion was echoed by the final evaluation, which found only a modest increase in milk processing activities at the household level and cooperative level.

According to the EDGET Dairy Team, a possible explanation for this unexpected result is that, from a farmer perspective, it only makes sense to invest in milk processing activities if there is excessive production and milk prices are low. It should therefore follow that as production levels continue to rise, it will become more economically feasible for cooperatives and other actors to scale up their processing activities.

An exception to this scenario is the temporary drop in demand for fresh milk that occurs during the fasting season. This opens up opportunities to increase the shelf life of milk by processing into butter and cheese – an opportunity that will be further explored in the next EDGET phase. Another strategy that was introduced during the first phase was to explore ways to link dairy farmers to milk markets where there is effective demand for fluid and processed milk products such as hotels and processors serving urban areas (see Practice Brief 6 in this series).

In addition to these economic factors, another lesson learnt is that it takes time to develop the capacities of dairy cooperatives: a slow and demanding process that requires a longer time frame than a four-year project. After recognising that the project did not have sufficient capacity to support 520 milk collection centres and dairy cooperatives as initially planned, EDGET reduced its target to 54 cooperatives and milk collection centres serving approximately 10,000 farmers. Furthermore, the project decided to decouple the establishment of dairy farmer groups from the establishment of cooperatives. This left room for other actors, such as agro-input dealers or more established dairy farmers, to organising the bulking and processing of milk. This was the case in the three woredas of Arsi Negele, Adaba and Debre Libanos. EDGET's experience thus underlines that dairy cooperatives are not the only solution for organising the bulking and processing of milk. In fact, where there is potential for private entrepreneurs take such initiatives the establishment of a subsidised cooperative supported by a project like EDGET could be counter-productive to the emergence of a strong dairy value chain.

Stop gap measures for AI services (Outcome 3)

The third EDGET outcome area concerned interventions to improve the enabling environment for dairy sector growth. The project initially anticipated that government agencies would submit proposals to address specific sector and institutional issues at the regional level. However, a call issued in 2014 did not generate good quality proposals. In late 2014, EDGET conducted a needs assessment that identified farmers' inadequate access to AI services as one of the most critical factors constraining the development of the sector. This had major implications on the project's implementation as one of the assumptions in EDGET's theory of change was that AI services for smallholder farmers would be covered under the government's Mass Hormonal Synchronisation and Insemination Programme (MHSI). EDGET's expectation was that the MHSI programme would cater for farmers' demand for crossbreeds and hence complement the project's support for improved dairy farm management. To date, 40-50% of households supported by the EDGET project do not own crossbreed cows, making it difficult to achieve EDGET's goal of doubling of farmers' income from dairy farming.

To address this constraint, EDGET agreed with regional partners that livestock agencies would be invited to submit proposals specifically addressing this gap. The project support included refresher trainings of artificial inseminators appointed at woreda and kebele levels, motorbikes for AI technicians (29 woredas) and the supply of liquid nitrogen containers to retain semen quality for longer periods. Over 55 government offices were provided with AI equipment, 183 AI technicians were trained, and six regional and federal level dairy sector institutions were supported.

However, this support was a stop-gap measure as resources available through the EDGET project were insufficient to offer farmers adequate access to AI services.

Women's entrepreneurship (Outcome 4a)

The fourth EDGET outcome area focused on encouraging women and youth, especially those who are unemployed, to engage in the dairy businesses.

The implicit assumption behind Outcome 4a was that EDGET's support would enhance opportunities for women and contribute to their empowerment. However, in the course of project, and especially after a gender study conducted in SNNPR region in September 2016, it became clear that women were unlikely to fully benefit from the project unless some structural constraints were addressed (see Practice Brief 5 in this series). For example, the numbers of women farmers participating in group trainings were much lower than men. Similarly, despite concerted efforts to encourage women to apply, only six of 50 agro-input stores supported by the project were owned by women. There was a risk that the EDGET project could have the unintended consequence that women would end up performing most of the dairy management tasks without reaping the benefits of improved dairy production.

It became clear that to fully capitalise on the opportunities offered by the project, the project needed to address the risks for women. These included:

- Ensuring that more women had access to both technical and business aspects of commercial dairy production. This required putting in place measures to encourage more women to attend training sessions, such as: inviting both men and women to trainings; and introducing criteria on the minimum number of women members who should attend each session, cancelling the training if this gender ration was not met.
- Supporting women to invest in improved breeds, cowsheds and equipment through enhancing their access to capital.
- Addressing women's poor representation in dairy cooperatives, where membership has traditionally been dominated by male heads of household. Some of the measures taken included raising awareness on the importance of gender balance in cooperative membership, staffing and management and setting targets to achieve this, in close consultation with the leadership of cooperatives.

With hindsight, EDGET should have addressed gender equity much more rigorously in the overall project design, for example through including a gender-related project objective at impact level. While the project made efforts to correct this gap by conducting a gender analysis in 2016, an important lesson learnt is that a gender strategy should have been in place right from the outset, supported by a rigorous monitoring and evaluation plan to enable the systematic gathering of gender disaggregated project data.

Youth entrepreneurship (Outcome 4b)

There is a tendency for development projects to lump underrepresented groups and stakeholders in one category. Analyses of the factors contributing to the exclusion of such groups are often haphazard and incomplete, resulting in one-size-fit-all interventions. EDGET was no exception. Although the project provided support for the establishment and capacity development of 43 dairy and forage production groups for "women and youth," the focus during implementation was primarily on women.

In reality, young people face different challenges to female farmers. Most rural youth do not have access to land and, faced with unemployment, they may have no option but to move to urban areas to earn a livelihood. Projects such as EDGET do create employment opportunities up- and down-stream of the value chain that, with the right training and support, could help motivate young people to venture into the dairy sector. These include milk collection, providing advisory services to farmers, forage production and silage making. The lesson learnt from the first phase of the EDGET project is that a tailored approach is needed to help young people to seize these opportunities. Therefore, the second phase of the project will recognise youth as a separate target group, with explicit strategies to reach out to this group in collaboration with the youth department within the ministry of labour.

Knowledge development and learning (Outcome 5)

EDGET recognised the importance of developing knowledge products to support learning at various levels. The project identified three main target groups for this: farmers; project staff and public extension agents involved in implementation; and other stakeholders such as policy makers and researchers.

A key component of this outcome area was the development of practical training materials for farmers, accompanied by technical guidelines and manuals for extension agents to enable them to effectively communicate with farmers on various aspects of dairy production and marketing. These knowledge products contained the best available knowledge on upgrading dairy farming and have been instrumental for the widespread application of this knowledge in the project areas.

To complement the technical information contained in the extension packages, EDGET organised field days at woreda and regional level where farmers met and shared their experiences. On average field days were organised once a year at regional level and at woreda level.

These extension efforts were complemented by surveys and other monitoring activities to assess the extent to which this knowledge had been taken up. For example, the project conducted studies of the adoption of forage practices by farmers and farmers' willingness to pay for improved technologies, such as Mazzican.

The information and insights derived from such studies were primarily used by project staff to further finetune project implementation.

EDGET also organised several learning events for core project staff (EDGET staff and their counterparts various government departments). The learning events produced eight Practice Briefs, four working papers and this synthesis paper. Each Practice Brief highlights concrete experiences and insights gained in a specific thematic that are conclusive enough to be shared with a wider community of practitioners, policy makers, donors and other stakeholders. For emerging issues where there were as yet no clear conclusions or lessons learnt through the project, the information was packaged in the form of working papers, primarily for internal use.

The principle underlying the EDGET learning events was that the very process of documenting data and tacit knowledge gained during project implementation is an effective method for reflecting on practice. It is also a valuable tool for validating what has been learnt through the project, while also identifying knowledge gaps for further research and experimentation. As they prepared for, and participated at the learning events, EDGET staff were involved in analysing data gathered as part of the monitoring and evaluation system. This helped to identify data gaps and formulate key questions that could be explored in follow up studies interviews. The project concluded with a national-level event to share this body of knowledge which representatives of key stakeholders, including the Ethiopian government, farmers' organisations, the private sector, the Embassy of the Kingdom of the Netherlands, and other development partners.

An agro-input dealer makes a follow up visit to a client. EDGET aims to scale up such privatised extension services

Conclusions

Evidence from household surveys conducted by during the course of the EDGET project, as well as the final evaluation, revealed that most interventions were highly relevant and effective. In particular, interventions relating to the strengthening of the capacity of the public extension system and the input supply system were credited with contributing to increased milk production and income for farmers.
However, available quantitative data was not sufficient to allow firm conclusions, especially with regard to the total number of farmers who have increased their income, by how much, and to what extent these changes can be attributed to EDGET.

As highlighted in this paper, an important contextual factor that hindered the project from achieving it's overall objective of increasing milk production and doubling the income of 65,000 farmers was the limited availability of improved dairy breeds under the government's MHSI programme.

There were also some flaws in the original project design:

- Staff capacity required to strengthen the capacity of 520 cooperatives was underestimated. Therefore, the target was reduced to 54 cooperatives.
- The project plan was based on the implicit assumption that the project would create opportunities for women, and lacked a gender strategy. The EDGET Team learnt that the project should not only focus on supporting women in seizing the opportunities created by EDGET, but that precautionary measures were needed to avert possible adverse effects.

Notwithstanding these contextual and design factors, the EDGET project has generated some important lessons that should be taken into account when developing and implementing a dairy value chain development project. Some of the most important include:

- Farmers are reluctant to invest in improving milk quality if this does not result in a higher price for milk. Therefore, quality-based payment systems need to be introduced by processors and cooperatives and regulations for safeguarding the quality of milk should be put in place and enforced.
- Cooperatives are not necessarily the only, or the best solution, for organising the aggregation and processing of milk. In some places it is possible that entrepreneurs such as agro-input dealers, are better able and positioned to take on that role.
- Dairy projects do not automatically generate equal benefits for men and women. Without precautionary measures women may even end up performing most of the work involved in upgrading dairy production without reaping the benefits. Therefore, a gender strategy must be part of the project plan right from the start.
- Women and youth should not be lumped together in one target group because different approaches are need to ensure that both these groups fully seize opportunities in the dairy value chain.
- For learning purposes it is important to invest in a sound baseline study and the development of indicators that not only focus on progress and results at output, outcome and impact level, but that also make it possible to monitor contextual factors. These broader influences include market prices of, and access to, dairy inputs and services, as well as demand for milk and processed dairy products.

THE SNV-EDGET PROJECT LEARNING SERIES

Practice Briefs

- Improved income from dairy farming
- Improved forage development
- Supplementary calf feeding
- Extension
- Gender
- Cooperatives
- Agro-input dealers
- Hygienic milk production and marketing
- A synthesis of lessons learnt from the EDGET project (2013-2017)

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/

ACKNOWLEDGEMENTS

Authors: Heinz Greijn (Learning for Development)

Peer reviewers: Hans Meenink, Mahlet Yohannes, Adane Kitaba and Zelalem Atnaf (SNV-EDGET)

Editing and coordination:
Wangu Mwangi (Learning for Development)

Photography: SNV-EDGET, Tewodros Beshah and Synergy Habesha

Graphic design:
Stefanie van der Vlies (ZOUT design & communicatie)

Production:
Meseret Kebede (SNV Ethiopia Communication)