



Adoption of improved dairy technologies in Ethiopia

The case of Mazzican

SNV-EDGET
Practice Brief 8
June 2018

Traditional methods for milking, storing and transporting of dairy products lead to spillage, increase the risk of contamination, and create additional workload, especially for women. The Mazzican (also known as Milking and Transportation System, or MTS) is a multi-purpose plastic container that can be used for collecting, storing and transporting milk in a hygienic way. SNV obtained a sub-licence¹ to manufacture and commercialise the technology in Ethiopia based on a prototype developed for the Kenyan market. In order to ensure sustainability, the introduction was not limited to promoting the technology itself but also the establishment of a MTS market and supply chain. This Practice Brief explains why the technical innovation was needed, how the EDGET project introduced this technology, and its potential impact in improving milk quality as well and reducing workloads for dairy producers, especially women.

Why Mazzican?

Traditionally, farmers use different containers for milking, storing and transporting milk. These include clay pots, metal or plastic buckets, and recycled jerry cans and bottles. This leads to wastage and increased risk of contamination at each stage. Additional sources of contamination could come from the cans themselves as they may not be suitable for milk storage and are often difficult to clean.

Mazzican is a durable 10-litre container made from food-grade plastic. It is designed in such a way that it can be used for milking, storing and transportation, hence the term MTS. The container has a wide opening at the top making it easy to milk directly into it. Other advantages include:

- Reduced spillage and contamination.
- Ease of cleaning due to the wide opening.
- Reduced workload because only one container needs to be cleaned.
- Improved milk handling due to the sieved funnel at the top, which traps dirt and other particles while milking, and which can also help to identify any abnormalities or health problems of the cow.
- Accurate measurement of milk output due to the litre calibration marks on the side of the can. This also prevents underpayment by unscrupulous traders, as farmers have an accurate record of exactly how much milk they are delivering to the collection point.

Evidence from other countries also reveals some positive health outcomes from the use of MTS technology. For example, field tests conducted by Tanzanian researchers with CGIAR's Livestock and Fish Programme in Mvomero District in Tanzania showed that switching from jerry cans to MTS led to a reduction of up to 76.3% in the levels of microbiological organisms present in raw milk samples (Kurwijila L.R et al, 2016).

What did EDGET do?

The Kenya-based company Ashut Engineers Limited, has produced and distributed the Mazzican in Kenya, Uganda, Tanzania and Rwanda since 2015. SNV-EDGET introduced the technology in Ethiopia after obtaining a sub-licence to market the technology in the country. EDGET contracted the Addis Ababa-based Universal Plastic Factory PLC to produce the Mazzican in Ethiopia.



Testing milk delivered by dairy farmers

Prior to the start of production, EDGET distributed samples of the Kenyan-made Mazzicans to smallholder farmers in various locations of Ethiopia. The test farmers found that the Kenyan cans were not practical to use as the average Ethiopian cows tend to be smaller. This led to a redesign of the can to create a shape that was slightly lower and wider than the type used in Kenya.

¹ SNV has signed a sub-licence contract with Global Good, a division of Intellectual Ventures, Seattle, USA (funded by Bill Gates) that partners with a broad range of non-governmental, public and private organisations to accelerate the broad dissemination of technologies aimed at solving some of humanity's most daunting problems.

Following production of the modified cans, EDGET distributed the Mazzicans to farmers through a network of 50 agro-input dealers contracted by the project. Members of EDGET-supported Dairy Farmer Extension Groups were given a voucher allowing them to collect a Mazzican at their local agro-input dealer shop.



Farmers collecting cans

In total EDGET ordered 100,000 MTS from Universal Plastic, out of which 65,000 cans were distributed to project-supported households. In addition, approximately 35,000 cans were distributed to other smallholder farmers not supported by the project.

In this case, distribution was carried out through offices of the Ministry of Livestock & Fisheries at different levels. Some MTS cans were distributed to private dairy traders and processors, dairy cooperatives and research institutions who subsequently passed them on to their smallholder suppliers.

Key results

In 2017, EDGET conducted a survey of 53 farmers who had received a Mazzican in the three project regions of Oromia, Amhara and SNNPR. 90% of the respondents described their experience of milking using MTS as "very good." The surveyed farmers also provided some suggestions on how to improve the design of the Mazzican. For example, the standard size of 10 litres was found to be too large for most households. They proposed that the project consider introducing a smaller, 5-litre can for farmers with a lower milk output.

In a survey conducted as part of the final EDGET evaluation, 67% of the farmers interviewed reported using the Mazzican for milking and 47% used it for transporting milk.

With regard to farmers' willingness to pay for the technology (see Figure 1), the survey showed that almost 30% of respondents would be prepared to pay between ETB² 100 and 200 (roughly US\$4 to 9) for a Mazzican. 39% said they would be willing to pay between ETB 50 and 100 ETB, while 27.3% said they would not pay more than ETB 50 for a can. A minority of respondents (around 5%) indicated that they were not prepared to pay anything for the Mazzican. Based on their experience in distributing the cans, two agro-input dealers attached to the project confirmed that setting the price above ETB 250 (US\$10) would put the Mazzican out of reach for most farmers.



Milking using Mazzican

Given that the full market price for one Mazzican is ETB 350 (roughly US\$15), these findings suggest that under current circumstances it is not viable to market the MTS on a commercial basis and that subsidies will be needed for the poorest farmers. On the other hand some agro-input dealers believe that commercial and semi-commercial farmers living close to the big towns may be willing to pay up to ETB 400 for a Mazzican. However, this needs to be further investigated.

² The devaluation of the Ethiopian Birr (ETB) in October 2017 saw a major drop in the currency's value against the dollar and other foreign currencies. The exchange rate used in this Brief is 1US\$ to ETB 23, which was the average official exchange rate in late 2016.

The EDGET Project

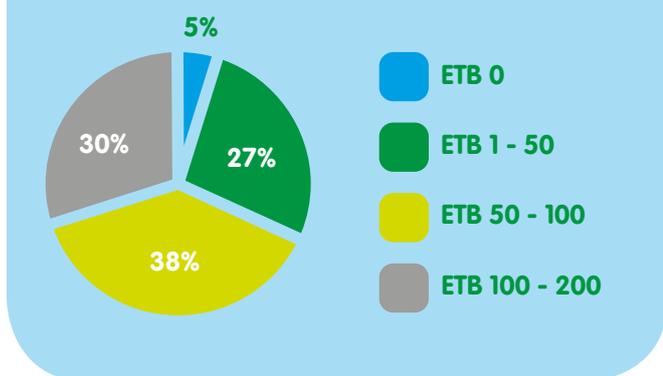
Enhancing Dairy Sector Growth in Ethiopia (EDGET) is a five-year dairy development project implemented in 51 woredas (districts) in the three regional states of Oromia, Amhara, and the Southern Nations, Nationalities and Peoples' Region (SNNPR). The overall goal of the project is to contribute to enhance 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

Figure 1: Farmers' willingness to pay for Mazzican



Conclusions and lessons learnt

The rollout of Mazzican provides an example of how a small technical innovation can lead to improvements across the entire value chain through improvements to farmers' productivity, quality of milk and developing a market for agro-inputs. As a solution for streamlining the collection, storage and transportation of milk, Mazzican has the added advantage of being much more affordable than aluminium or stainless steel alternatives.

However, the practicalities of rolling out the technology have also revealed some major gaps and areas that need further attention.

Addressing women's needs

The experience of farmer Beletu Bansa (see box) highlights the importance of addressing women's needs when rolling out new technologies such as MTS. Beletu is a typical female dairy farmer who is responsible for most of the milk production and processing tasks in her household. But it was her husband who collected the Mazzican from agro-input dealer and therefore also received training on its use. With hindsight, the project should have made more efforts to reach out directly to women users to share information on how to use the cans (Practice Brief 5 in this series discusses some strategies for addressing structural gender issues in the dairy value chain).



Delivering milk with Mazzican

Developing a viable market mechanism

With regard to sustainability, it is still too early to demonstrate the impact of MTS on the dairy value chain. As highlighted in the survey on farmers' willingness to pay, there is not yet sufficient effective demand for distribution of Mazzican on commercial terms. There are various explanations why this is the case:

- Investing in Mazzican does not contribute to a significant increase in income for the farmer. Traders and consumers pay the same price for milk that is produced using Mazzican or the conventional containers.
- There is currently no incentive for farmers to supply better quality milk using MTS since hygiene regulations are not systematically enforced.
- Some unscrupulous traders refuse to buy milk brought in the calibrated Mazzican because it eliminates the need to use traders' own measuring cans. This makes it difficult for traders to increase their profit margins by tampering with milk measurements.

As indicated by the EDGET household survey, perhaps an even more salient issue with regard to farmers' ability to pay is that the market currently does not offer a premium for milk quality. Only milk volumes count. Unless cooperatives and commercial processors start to distinguish between poor and high quality milk there will be no incentive for farmers to deliver improved quality.

These "real life issues" make it clear that disseminating MTS technology without making the requisite changes in the regulatory and market environment will not deliver the expected results. For example, enforcement of government hygiene regulations would help eliminate non-food grade equipment from the market, which in turn would provide incentives for farmers and other value chain actors to invest in Mazzican and comparable technologies.

Using MTS technology: Feedback from farmers

Beletu Bansa's story

"My name is Beletu Bansa and my husband is Petros Kerfafa. We live in Jara Hinesa kebele of Hawassa Zuria woreda (SNNPR region). EDGET has been supporting us with our dairy farm. For example, Petros was provided with various dairy inputs including forage seeds and cuttings and a special calf starter. He also attended several training sessions. In 2017, he was given a Mazzican. The dealer explained to him how to use the equipment and he then explained it to me. At first, I did not understand which benefits it would bring and I did not use it. But when I tried it after a few days I started to like it. I can use the Mazzican for different purposes including milking and for storing and for carrying the milk. It is simple to hold and to handle. It looks nice, white and attractive and it is also much easier to clean than the clay pots I used before. For cleaning I use hot water."

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

Clarifying EDGET's role

A third broad lesson learnt concerns the role of EDGET in bringing MTS to the market in Ethiopia. By procuring the sub-licence as the sole distributor of Mazzican in Ethiopia, EDGET effectively became a value chain actor in its own right, a process that has taken a lot of time, money and effort. While EDGET entered into a contract with Universal Plastic in 2014 (which was the only Ethiopian company with the capacity to manufacture Mazzican at the



MTS production line at Universal Plastic Factory PLC

time) the company did not have an established distribution network in the country. This contrasts with the aggressive marketing stance taken by Ashut Engineers Limited, a private company that has taken the lead in producing and distributing the Mazzican in Kenya and other countries in the region.

EDGET's position was further complicated by its legal status as a non-profit organisation. To avoid creating dependency, the project would have preferred to offer the Mazzican to farmers on a cost-sharing basis right from the outset. However, this approach was not in line with the government's Charities and Societies Agency, which prohibits non-governmental organisations such as SNV from earning an income from selling products or services.

In order to find a more sustainable market solution, EDGET has continued efforts to support Universal Plastic (UP) to take on more dynamic role in both the production and marketing of Mazzican in Ethiopia. The two partners have agreed to take the following steps to consolidate the investments already made and develop a commercially viable production and distribution system for MTS in Ethiopia.

1. SNV and UP will organise a market launch for Mazzican to introduce the product to a broad range of dairy sector stakeholders, including farmer organisations, processors, livestock development institutions and donors.
2. UP will issue a call for local distributors who can become part of a country-wide wholesale and retailing network.
3. EDGET and its partners will lobby for enforcement of government rules and regulations on milk hygiene and quality to create incentives for the development and marketing of innovative, food-grade MTS products.
4. EDGET will continue to provide technical support to industrial processors and milk processing cooperatives on how to use MTS in a Quality-Based Payment System, as well how to ensure overall improvements to milk quality.

Building on this experience, SNV-EDGET aims to revert to its role of catalyst and facilitator within the dairy value chain. This will leave room to private sector actors to drive the market uptake of MTS in the future.



A stack of MTS cans produced at Universal Plastic Factory PLC

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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/

ACKNOWLEDGEMENTS

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