

A Pioneering Initiative to Commercialise Bio-slurry: The case of Melkam Endale

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BACKGROUND

Melkam Endale is a sole proprietorship enterprise established in 2011 in the Oromia Region, North Shoa Zone, Sululta Woreda, Wersomalima Kebele, which is one of Ethiopia's milk hubs located around 30 km north of Addis Ababa. Mr Melkam Endale Hunegnaw started the dairy business in 2011 with about 20 head of local breed cows and has crossbred to increase the quality and size of the herd to more than 100 head. As the number of cows has increased, waste management has become challenging, which restrains Melkam from



Mr Melkam Endale Hunegnaw

increasing the number further. In 2021, Melkam built a bio-digester with a capacity of 80 m³ that was used as an energy source for the cold store and incubation rooms and for workers to cook food.

Following his expansion into the input supply business in 2021, Mr Hunegnaw recognised the increasing demand for both domestic and imported organic fertiliser. Thus, Melkam saw a business opportunity in commercialising the bio-slurry as it has valuable crop nutrients and pesticide properties. In 2024, Melkam co-created a business plan with the CASA Programme to commercialise the bio-slurry to supply to soybean and vegetable farmers. However, the first test result from the standards authority revealed that many of the critical nutritional requirements did not meet the required standards to grant certification. The CASA partnership has thus focused on improving the nutritional quality of the bio-slurry and strengthening the internal administration of Melkam.



Methane storage balloon and connected generator for energy sourcing



Technical assistant conducting recipe treatment to improve the quality of bio-slurry nutritional content

DRIVING FACTORS TO CONSIDER BIO-SLURRY AS A BUSINESS



Growing demand for organic products

The increasing number of private and smallholder farmers who are engaging in organic production for both the domestic and export markets caused Melkam to see a potential market for organic bio-slurry production.



Growing demand for alternative fertiliser

Melkam observed that the demand from smallholder farmers for Eco-Green and other imported liquid fertilisers was growing significantly, both in his shop and nationally. This led him to develop his own organic fertiliser (bio-slurry) for commercial purposes from the dairy farm by-products.

Managing waste

Although Melkam built a bio-digester, it did not effectively reduce the volume of waste; instead, it serves as a source of energy by trapping methane. He utilises a small portion of the slurry to grow fodder for the animals. The remaining waste was a challenge to dispose of due to small working premises. On the other hand, meeting the standards on the regulatory checklist became a challenge that posed a serious threat of closing down the farm.



Encouraging enabling environment

The Ethiopian Government has significantly promoted domestic fertiliser supply due to rising synthetic fertiliser prices, and to reduce the heavy reliance on imported fertiliser, which has encouraged Melkam to supply liquid bio-slurry.



IMPLICATIONS FOR LARGE AND MEDIUM DAIRY FARMS

Ethiopia has the largest livestock population in Africa and is among the top ten in the world, dominated by smallholder free-grazing local breeds. In recent years, medium-sized dairy farms have been growing around the main cities. They have faced significant waste management challenges in meeting the environmental regulatory requirements and so the government has encouraged the domestic production

of liquid fertiliser. The success of Melkam's effort to produce bio-slurry would provide a good example to other dairy farms to engage in bio-slurry production that tackles the physical limitations of discarding the animal waste, meets regulatory requirements to prevent the threat of closing the dairy business, and diversifies income from the circular economy.



Farmer visiting vegetable field grown using bio-slurry

CHALLENGES MELKAM FACED TO COMMERCIALISE BIO-SLURRY

The Ministry of Agriculture has specific quality parameters for domestic liquid fertiliser products to grant a qualification certificate, which Melkam was unable to meet. He had limited information about the nature and characteristics of the liquid fertiliser market outside his domain to begin a pilot market if he managed to get the certification. He also lacked a clear product vision to position the bio-slurry in the national market in terms of internal capacity, quality, and market strategy. The CASA partnership focussed on supporting Melkam to address these challenges.

THE CASA PARTNERSHIP AND INTERVENTIONS

Internal capacity: Following the partnership agreement referring to the co-created business plan, through a short-term consultant, CASA supported the development of a human resources manual, and updating of the financial and procurement manuals. These manuals helped Melkam establish transparent internal controls and accountability, while also

improving operational efficiency, transparency, and consistency. Although Melkam had financial and procurement manuals before, they were insufficient for managing the current growth of the enterprise. The consultant supported Melkam to develop a five-year strategic plan that encompasses the business's portfolio, including the bio-slurry.

Bio-slurry quality improvement: CASA recruited an experienced short-term consultant to improve the quality of the bio-slurry and to meet the requirements set by the Ministry of Agriculture to acquire quality standard certification. The consultant conducted three rounds of treatments (recipes) and lab tests by the Ethiopian standards authority, on 15 parameters. The consultant has also developed a Standard Operating Procedures to be followed during the production process. The bio-slurry requires a minor recipe adjustment based on the final accepted composition once the minimum and maximum nutritional requirements are fulfilled.

Market strategy: Another business consultant was recruited to develop a market strategy to support the commercialisation of bio-slurry. The document identified key potential market areas, competitors, market characteristics, feasible market segmentation, distribution channels, and a promotion strategy. The strategy provides a clear direction for Melkam to follow in commercialising the bio-slurry once the quality certification and licence are granted.



The Melkam inputs shop

CHALLENGES ENCOUNTERED IN ACQUIRING THE CERTIFICATION

The partnership with Melkam supported the commercialisation of bio-slurry to supply to farmers for soybean, vegetable and other crop production. However, these factors have constrained the achievement of his goal:

- The Ministry of Agriculture assigned staff to take samples to provide to the standards authority for the lab test to be conducted, but responses from the standards authority have been slow.
- The heavy metal test had to be conducted in Germany, which took 5-7 weeks for every round of testing conducted so far, and the difference in testing methods at different service providers affects the result consistency.
- The parameter standard was under revision, which took nearly six months until final approval by the House of Representatives in 2025. During this time, the Ethiopian standards authority suspended service provision (including sample testing), which hindered the sample-taking process.

ACHIEVEMENTS AND SUCCESS

The revised finance, procurement, and human resources manuals standardised internal operations and helped the staff to understand the rules and procedures. The financial manual particularly helped to improve the coding for cost and income segregations. The enterprise now has a transparent operational system for its internal and external controls, and all the necessary procedures are now in place.

The quality of the bio-slurry nutritional composition has significantly improved, due to the technical support from the short-term consultant. Although concentrations of the heavy metals chromium, arsenic and cadmium are still too high, the remaining parameters have now met the requirements. In the



Liquid bio-slurry fertiliser

second round of testing, the failed parameters have shown improvement, reaching close to the accepted range. A third round of recipe formulation is now ongoing, hoping for a high chance of success.

The enterprise has started identifying potential distributors as per the market strategy. Melkam is collecting useful suggestions from agro-dealers to consider during the product piloting. This helps to gain insights into the market and promote the product ahead of time.

THE WAY FORWARD

Currently, Melkam is working to secure certification with a technical expert to improve the nutritional quality. His plan is to supply 1,500 m³ of liquid bio-slurry to the market in the piloting year around the Oromia region and to reach 7,500-10,000 producer farmers. His medium-term plan is to upgrade the current manual filling and sealing to a semi-automated operation to ensure efficient operation and quality assurance. In the coming 2-3 years, Melkam plans to establish his own in-house laboratory and operational research units to maintain quality consistency and improve market competitiveness, including a research partnership with Hawassa University, which is intensively working on bio-slurry as part of its community research and development initiative.





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