

Supporting the Development of the Dairy Sustainability Framework for Smallholder Dairy Operations in India - Case Study



About the Project

Dairy for Social Impact, a project funded by the International Fund for Agricultural Development (IFAD) and Global Dairy Platform (GDP), assists dairy organisations in emerging dairy markets to implement the Dairy Sustainability Framework (DSF). This process includes the review and prioritisation of sustainability challenges, which ensures that improvement strategies are effective and deliver tangible results. The objective is to capture the dairy organisations' experiences throughout different geographies and markets to provide guidance to others. In this case study, Amul explains the process they implement using a biogas project as the example.

The partners in this pilot are Amul, a major dairy co-operative processor in India, and the DSF, a non-profit organisation developed by the global dairy industry to monitor and report the aggregate sustainability progress of the sector and to provide a platform for pre-competitive collaboration and knowledge sharing.

India is the world's largest milk producer. Implementation of the co-operative model across India enabled farmers to become financially independent by owning the entire farm-to-market milk supply chain. Amul is India's largest dairy co-operative, sourcing 26 million litres from 3.6 million dairy farmers daily, operating through 18,600 village milk co-operative societies and 18 member unions across 33 districts.

Kaira District Co-operative Milk Producers' Union Ltd., also known as Amul Dairy, is based in Anand, Gujarat. Originally started 77



years ago in two villages from the Kheda district, Amul is now one of the largest dairy co-operatives of the world.

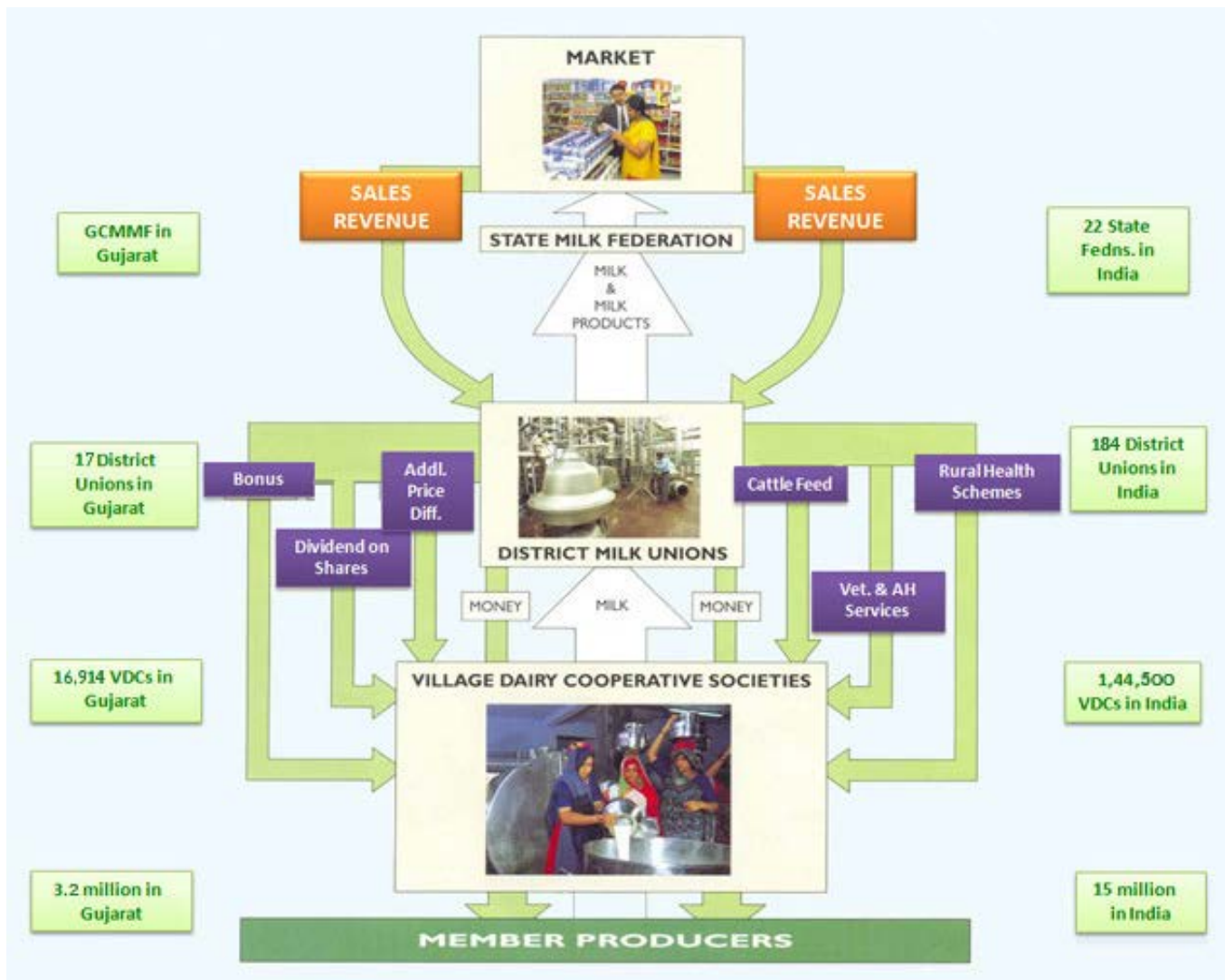
Amul partnered with DSF to ensure that future DSF developments can accommodate the needs of different geographies and importantly the emerging dairy markets that are investing and sourcing milk from predominantly smallholder farmers.

Executive Summary

The Indian Dairy Sector is predominantly developed on a co-operative model (initiated 1970 – Operation Flood). Amul as a co-operative applies a 3-tiered model with co-operative societies at village level that are federated under a Milk Union at the district level and a federation of member unions at the state level. The

hallmark of this model is maximizing farmer profit and productivity through the co-operative effort.

Dairying in India is a robust example of socio-economic development. Co-operatives like Amul have been instrumental in supporting poor and marginal farmers.



Environmental sustainability has taken the centre stage across the globe in recent years and the future lies in sustainable solutions. The implementation of alternative solutions to the traditional methods of feeding and manure management are just some of the most important steps taken towards environment sustainability by Amul Dairy.

To achieve the desired outcomes of this project, the DSF recognised that Amul had a robust process in place to influence change at the farm level. The vast majority of farmers marketing

their milk to Amul have between 2 and 5 cows/buffalo and limited other opportunity to increase their income. In fact, across India there are 62 million households engaged in dairying with 77% of milk procurement from small marginal and landless farmers. Appreciating the Amul approach to identifying needs and addressing challenges is extremely valuable in ensuring the DSF is applicable for all dairy systems.

This case study focuses on the biogas initiative that Amul has been implementing since 2017. The project highlights the interrelationships between the different sustainability topics. Originally this project set out to improve hygiene in both milk production and in the farmers' homes by creating a circular economy for small and marginal producers. Biogas was an important component providing a management opportunity for manure and also a source for clean cooking fuel.

As a result of the biogas component of the project Amul has seen:

- Increased farmer income
- Time savings for the women
- Reduced deforestation
- Better health of farmers and their families

Focusing on a single priority area and recognising the potential for wider (both positive and negative) impacts is critical for success. This project started slowly, though working with trust and collaborating with key organizations is achieving the desired results.



Back to Basics

The concept of anaerobic digestion for Indian Dairy farms started 7 years ago as a potential solution for the cow manure heaps or pits that used to line the roadside in villages and were easily visible to passers-by. Exploration into science-based options to effectively remove the manure storage was initiated.

The Amul team was able to develop a flexi-biogas prototype suitable for smallholder farmers and put it to the test at one of their 'model farms' in partnership with a social enterprise that was working with the National Dairy Development Board of India (NDDB). The concept worked and this was the start of an effective collaboration between Amul, NDDB and the Indian Government.

Having identified the test village, attention was focused on convincing farmers that this was a concept worth considering. Building on platforms such as women's self-help groups and livelihood improvement support that were already in existence in the village, it was an opportunity to also introduce the concept of anaerobic digestion (AD). This was not an easy process, especially as it was an innovation that carried an investment for the flexi digester. Several meetings, awareness campaigns and demonstration site visits were conducted for the farmers to better understand what was involved. Eventually, some farmers in Zakhariyapur village agreed to install a small number of digesters.

Each biogas plant has a capacity of 2 cubic meters and costs Rs. 24000 (US\$300.00). These installations were provided to

the volunteer families who had an average of 5 members and 3 cattle. The initial investment was recouped through savings in cooking fuel (LPG) within approximately 2 years. The women of the family benefitted greatly, reporting major time savings in both firewood collecting and the ordering of LPG. In addition, by burning a cleaner fuel there is improved living conditions in the house.

NDDB and the progressive farmers in Zakhariyapur village installed an initial 25 biogas plants with great success. An additional 100 units were installed based on farmers seeing first-hand the benefits of such an opportunity. This number has now risen to over 400 units as part of a government-supported CSR program across two villages (Zakhariyapur and Sahakari Mandali). An important component of the program is that the women own the biogas production process.



Co-Benefits - Beyond GHG Emissions

The use of livestock manure as an effective organic fertilizer for crops is well known in India. However, the introduction of manufactured fertilizer that is a more consistent product and easily accessible and applied to the land has become a more popular product of choice by farmers. The traditional use of manure for this purpose has lost its appeal due to the manual labour required, associated costs and the reducing availability of rural land in close proximity to the farms on which the manure can be applied.



Cattle in India are estimated to generate some 992 Million Metric Tonnes of dung annually. This dung has the potential to generate clean cooking fuel and bio fertilizer via anaerobic digestion. The biogas generation potential is estimated to be equivalent to 50% of India's current annual LPG consumption.

When producing biogas from the manure and straw, there is an extremely valuable co-product known as digestate. Digestate is an extremely effective organic fertilizer that farmers can use to nourish their forage and food crops. It is estimated that if the 992MMT is processed through AD, this would provide 44% of India's N, P & K requirements with a value equivalent to Rs. 42.5Bn. Often there is more digestate produced than is required as a fertilizer on the farm where it was generated. This has opened another income-generating door for the benefit of the Amul smallholder farmers.

Amul and NDDB established a slurry/digestate women's-only co-operative processing plant. This facility has the capacity to process 10 metric tonnes of bio-slurry per day and has created 8 new employment opportunities.

The slurry (digestate) is collected from the farmers biogas plants and is procured on volume plus two quality parameters – BISX (dissolved solids) and electrical conductivity. On average these initial 400 farmers have the potential to generate an average of Rs. 120 per day which is additional to the current average of Rs. 125/ day that they earn through milk sales!

- **Ensure that your early adopters (especially) are supported (technical/human):** It is worth supporting and investing in early adopters of change, so that other farmers can develop the confidence to change based on the early adopters' experiences. This may also mean investing in skills development of your own staff or contracting others with the necessary skills.
- **Financial support is always helpful** – Farmers are shrewd business men and women! They will not invest any available capital they have in any new concept/practice change (including climate saving initiatives), until they appreciate the benefits.

Financial support may come in the form of government grants, or reasonable loans from the dairy co-operative/company that are reimbursed over an agreed timeframe. Sustainability is about making the individual business (including the farmer's livelihood) more robust – ensure you have the evidence available that underpins this message before seeking any farmer investment.

- **Learn from experiences:** The first 400 biogas plants took 1-2 years to install. In 2023, 600 biogas plants were installed in 3 months. They also received 70% grant support from the government and experienced technical support from Amul.

What should others consider when looking to improve sustainability of the dairy value chain?

- **Focus** – Don't try and solve all sustainability challenges at once. Amul has a single focus and that is improving the conditions of their farmer owners.
- **Broader benefits:** What are the wider benefits of your actions. You will be surprised at the wider impacts of even the most focused project with farmers.
- **Invest in others:** The greater the human resource that can support the project, the greater the chances of success. Amul field staff have been trained and empowered to technically

support the farmers in these biogas projects. This project is an extremely positive opportunity when the field technicians are working with the villages.

- **Look for collaborative opportunities:** Collaborative activities can result in an enhanced outcome. e.g. farmer incomes are increased and at the same time GHG emissions are reducing, which can support the government in achieving its national climate commitments.

Next Steps for Amul

Based on the success of the initial installations and associated wider benefits, Amul has now installed 1,100 biogas plans in 600 different villages, with plans to install an additional 10,000 biogas plants on farms by 2024.

Quantifying the impact of these biodigesters is now a major focus for Amul and technology will play a role in supporting both farmers and Amul in delivering the desired outcomes. For example, Amul is developing technology that will allow farmers to receive all reports

on their mobile phone, such as: "gas generated," "income from digestate sold to the co-op," or "additional dung sold".

With the additional income for the farmers also comes the positive climatic impact of the digesters. Individually the impact may be small, though collectively the Amul farmers will be supporting their government in achieving their climate targets.

Amul is exploring how the mitigation actions can potentially be used by the farmers in the form of carbon credits as an additional income stream.

What is the DSF doing differently now?

Considering the learnings from engaging with Amul and the National Dairy Development Board of India, the DSF has embarked on a process that establishes a new membership structure that caters to an even wider array of dairy sector organizations and supports them through a development process.

The DSF established a working group of DSF members, representatives of the DSF Advisory Council, potential members and organizations actively involved in dairy development activities in a number of emerging dairy sector geographies. This group first established some key principles:

- Developments must not establish a two-tiered system of DSF membership
- Remove complexity to ensure a positive start
- Support from the DSF and its membership on the process of implementing the DSF is critical

The new stage 1 membership level removes any complexity associated with DSF membership and is a stage where support from both the DSF Secretariat and other members is always available. It is ideal for dairy organizations who are just starting their sustainability journey or have limited resources.