MANAGING BUSINESS VALUE CHAIN IN BANAS DAIRY: A CASE STUDY OF BEST PRACTICES IN OPERATIONS MANAGEMENT AND BUSINESS PROCESSES

Pramiti Rawat*

ABSTRACT

Supply chain management, business operations, and innovations in logistics play a major role in the success of today's industries. This paper endeavours to study the end to end business operations and supply chain management of Banas Dairy, located in Gujarat, India. This paper explains the business processes that led to Banas Dairy becoming the number one in Asia. These high-level processes that Banas Dairy has defined can be used to replicate its success in the dairy industry.

It is the best example of a successful and integrated Gandhian model with business operations, supply chain management, and technology.

Keywords: operations, supply chain, innovation, dairy process

INTRODUCTION

Dairy products are a ubiquitous part of our consumption habit. They are present either as products such a milk and curd, or as critical

** Student-Integrated MBA*
Institute of Management
Nirma University

ingredients such as cheese and paneer within iconic products like parathas and pizzas. The dairy industry is a promising industry in India.

India is the world's largest milk producer, with 21 percent of global milk production as per the Food and Agriculture Organization of the United Nations. According to a study published in *The Hindu, Business Line, India* (2019), India has a cattle population of 536 million. The supply of milk for the dairy industry comes from millions of small producers spread mainly over rural India. This is a classic example of production by the masses instead of mass production. Banas Dairy is one such case.

This research began with a documentary titled 'Super Factories — Banas Dairy', *National Geographic, India* (2017). Banas Dairy had implemented and operationalized all the best practices that are necessary for the growth of a company. In addition, theirs was a co-operative model and utilizing the strengths of the co-operative and Gandhian models, they were able to grow faster. Banas Dairy was able to achieve the maximum growth possible in comparison with the dairy industry.

This research paper analyses the integration between management, models, and processes that could be done by the dairy industry for faster growth. This paper also analyses the strengths of the supply chain processes, from the point of view of a co-operative structure which is also the base of the Gandhian model.

The case study slowly took shape and went on to encompass the following:

- Theory of Constraints as defined by Eliyahu (1984) in his book, *The Goal*
- Just in Time inventory management, as the raw material — milk — was a perishable commodity
- Supply chain management concepts, practices, issues, and implementations
- Operations best practices
- Gandhian model
- Growth by providing various services to the farmers so that they can increase the milk yield per cow and health facilities for the farm and their families.

Each of the above models are among the best, and Banas Dairy was able to synergize all of them into one complete best practices model. It was and is still able to achieve the highest

possible growth of all times within their industry. All the business processes are analyzed and presented so that they can be replicated by the dairy industry for maximizing growth.

LITERATURE REVIEW

A typical dairy supply chain is considered as a composite network of a number of processes linked from 'farm to fork', such as farmers, input suppliers, cooperatives, pack houses, transporters, exporters, retailers, and finally consumers. According to Zhang, Habenicht and Spief (2003) and Lowe and Preckel (2004), a dairy supply chain consists mainly of four modules. These modules include raw milk suppliers, the plant, warehouses, and the end consumer. The producers, processors, and distributors can strengthen their competitiveness and market growth by maintaining the cold chain in an economical way.

The documentary, 'Super Factories — Banas Dairy', *National Geographic Chanel, Asia* (2017) was instrumental in making this a comprehensive case study. By the time this documentary was made, Banas Dairy had become one of the largest dairies in Asia within just a few decades of being operational.

Eliyahu (1984), in his book, *The Goal,* mentioned the 'theory of constraints' that ties well with the documentary on Banas Dairy. According to the theory of constraints, we must look at the bottlenecks within each business process and manage them optimally. Managing processes to an optimum level involves maximizing the final output while ensuring that we do not try to optimize each business process as a silo. The factory not only identified the bottlenecks but was also able to successfully increase the production capacity to its maximum by optimizing the bottlenecks. Banas Dairy is a classic example of best practices that could be designed anywhere, provided the right kind of people are involved in the design, implementation, and management of the operations.

The case study was also able to utilize the 'Just-in-Time' (JIT) management concept. JIT implementation improves performance through lower inventory levels, reduced quality cost, and greater customer responsiveness (Dange, Shende, and Sethia, 2016). The result of this paper shows that the removal of the buffer system increased the manufacturing system's need for mix flexibility. It also indicates that the JIT system is successful and operating the JIT system can lead to many advantages to the case company. Just-in-Time (JIT) means making only what is needed, when it is needed, and in the amount needed. Supplying what is needed, when it is needed according to this production plan can eliminate waste, inconsistencies, and unreasonable requirements, resulting in improved productivity.

In the JIT way, all operations were automated, and the factory used to work 24x7, converting milk into processed milk and other products as per the demand from Amul. As the output was more than the factory could process, everyday 10 lakh litres of milk were transported via train to the National Capital Region (NCR) for further processing. The processing was done near the customer as per regional demand. Another example of JIT inventory management can be seen in the dairy industry's perishable product, milk. Milk could be produced into various milk products as per market demand. The end to end business processes including supply chain handling were managed to the highest effective level possible.

As a way of improving the overall system, the co-operative automated the entire plant operations with emphasis on developing a zero-human interface. The employees are now only involved in operating computer systems and packaging on the production line. They have 25,000 employees on role who were trained to work smarter instead of depending on hard labour. To date, this helps the management generate greater revenue not only for the dairy but also for the farmers.

It was also a classic case of optimum supply chain management as per previously identified industry best practices. According to Altekar (2013), supply chain management is the plan and control of material and information flow among suppliers, facilities, warehouses, and customers with the objectives of minimization of cost, maximization of customer services, and flexibility. In his paper, a supply chain model has been developed for a dairy located in Andhra Pradesh, India.

Cooper, Lambert, and Pagh (1998), have focused on what they believe to be the most essential variables for understanding and managing the supply chain. The definition of SCM (Supply Chain Management) used in the above mentioned article by Cooper, Lambert, and Pagh (1998), was developed in 1994 and modified in 1998 by members of The Global Supply Chain Forum; "Supply chain management is the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders."

Singh, Bawa, and Sharma (2017), evaluated the Gandhian economics of J C Kuamarappa (1951) and investigated whether these economics could serve the purpose of business, and help make attempts to find out where this theory stands in comparison with other theories. The study finds that Gandhian economics considers all the levels of human existence while defining economic parameters. It is a case study that synergized the Gandhian model with all the operational aspects into a 'maximum possible growth' scenario; this was carried out in

the context of a co-operative model, because Banas Dairy is run by a co-operative of farmers in the Banaskantha district of Gujarat.

RESEARCH METHODOLOGY

This paper endeavours to study end to end business operations and supply chain management in the dairy industry by analysing the case study of Banas Dairy. The research consists of collecting data from a single secondary source, i.e. the video documentary: Super Factories — Banas Dairy, *National Geographic Chanel, Asia* (2017). The case method used is exploratory.

The objective of the research is to study the processes implemented by Banas Dairy and provide a standardized procedure which can then be used by everyone in the dairy industry. Each sub process executed by Banas Dairy has been examined to better illuminate the case.

CASE ANALYSIS [Super Factories- Banas Dairy, *National Geographic Chanel, Asia* (2017)]

Introduction

The GSFC (Goddard Space Flight Centre) defines supply chain management as, "the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders" (Cooper, Lambert, and Pagh, 1998). Supply chains coordinate the external and internal processes with a collective and unified front. "Supply chain management can be seen as the process of strategically managing the procurement, movement, and storage of materials, parts, and finished inventory (and related information flows) through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost-effective fulfilment of orders" (Altekar 2013).

Banas Dairy was established in 1969 in Palanpur, Banaskantha district. The dairy is situated in a barren land with no rains and the nearest city is 150 km away. It was started using the already successful model of Anand and Mehsana dairies. It was founded by Galbabhai Nanjibhai Patel. This co-operative dairy has become Asia's number one in milk production. Banas Dairy is responsible for 25% of the turnover of Amul's branded products.

Banas Dairy's Supply Chain

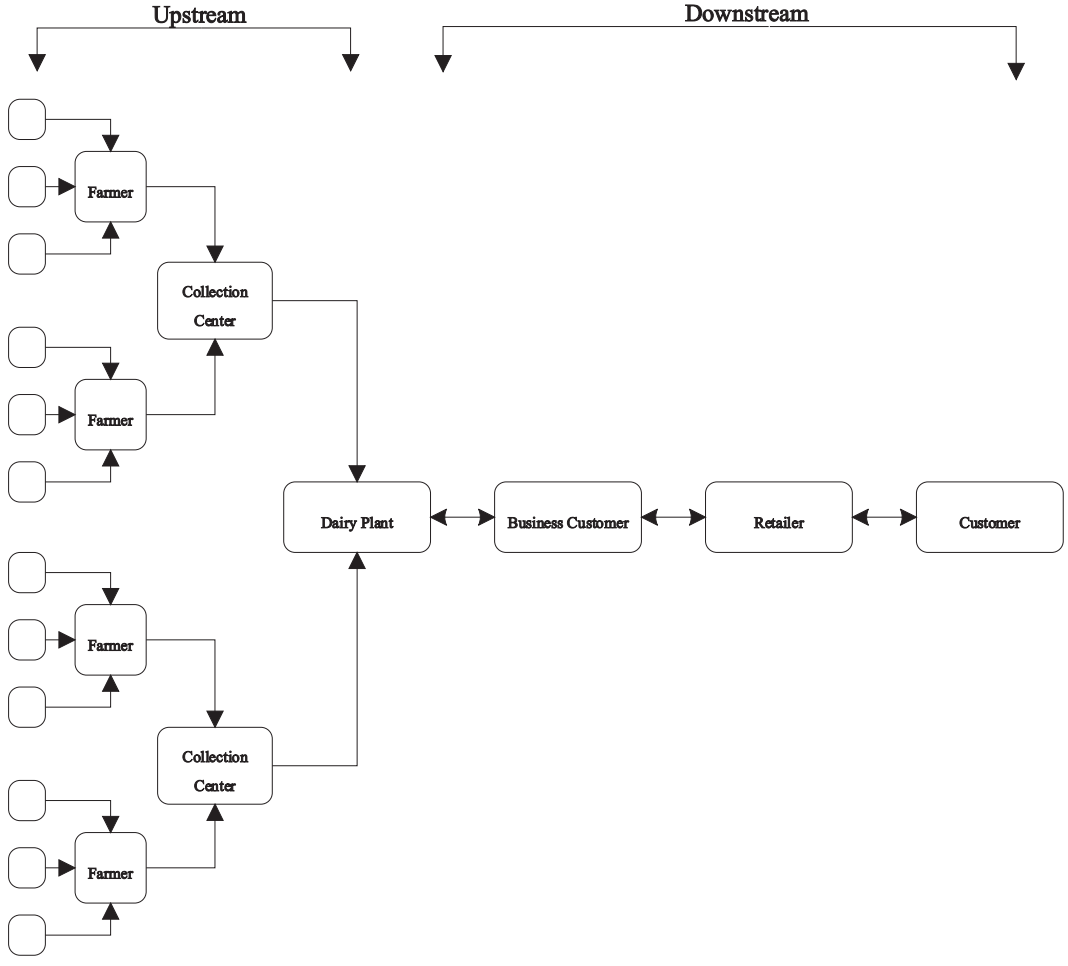

Figure 1: Banas Dairy's Supply Chain

Figure 1 illustrates the major units in Banas Dairy's supply chain and the flow of information: upstream and downstream to coordinate the processes involved in collecting, producing, transporting, and selling the dairy products. The supply chain of Banas Dairy is divided into two parts — the upstream supply chain, and the downstream supply chain.

The upstream supply chain consists of all the processes needed to gather the raw material to create a product. In this particular case, the raw material is milk. The upstream process involves the sub processes of milking the cows, and farmers transporting the milk to the collection centres. From the centres, the milk is tested and transported to the dairy plant.

The downstream supply chain consists of all the processes needed to process the raw material collected in the upstream process into the finished product. The finished products obtained in this case are processed milk and various other milk products. The downstream process involves the sub processes of transporting the finished products from the dairy plant to the business customer. Amul is Banas Dairy's main business customer. From Amul, the products are transported to the retailers who then sell the products to the end users.

The processes implemented by Banas Dairy have cohesively brought together the best practices of effective and efficient world class supply chain. The supply chain processes have achieved a synergy by combining automated processes with the strengths of the Gandhian model.

Farmers/Milk Suppliers

This co-operative dairy was started with 100 members and 800 litres of milk collection per day. Then, in the next fifty years, the membership went up to 3,50,000 members, 16,00,000 cattle and daily milk collection of 50 lakh litres.

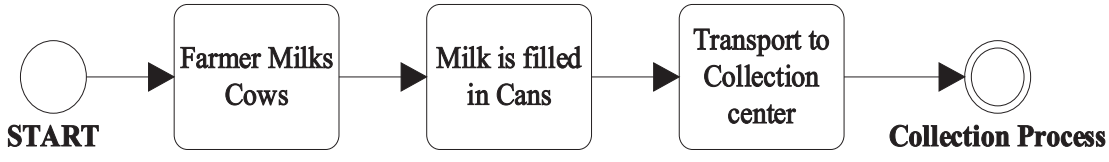

Figure 2: Farmers / Milk Suppliers

As explained in Figure 2: The farmers are from villages in the Banaskantha district. They wake up at 5am every day to milk their cattle. Suppose a farmer has 35 cows; it will take him a minimum of 3 hours to get approximately 250 litres of milk. On milking the cows, the milk is filled in cans and transported to the local milk collection centre. There are numerous milk collection centres, spread over the Banaskantha district, for farmers to deliver the milk. One such centre is in Thavar village, where more than 1,000 farmers deliver their milk daily.

Collection Process

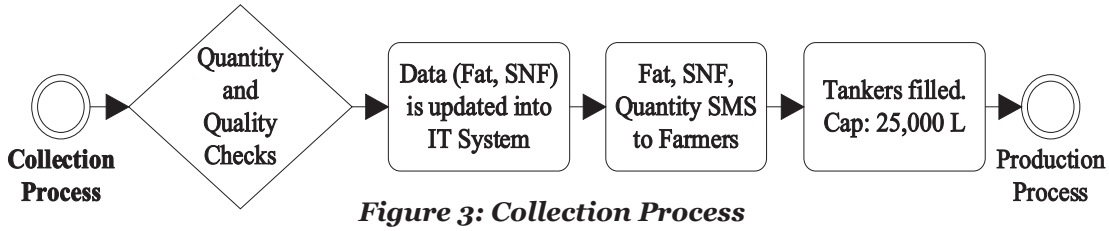

Figure 3: Collection Process

As explained in Figure 3: At the collection centre, the quantity and quality of milk are measured. During the quality check, the amount of fat and SNF (Solid Not Fat) in the milk delivered by each farmer are checked. This data is then updated into the IT system. Banas Dairy has an app which sends a message to the farmers as soon as their milk is accepted. The app records the volume of milk supplied, the fat content, and the money earned. This data helps the farmers keep a track of the quality and consistency of milk they supply daily, thus improving the production of milk.

Once all the milk has been collected, 500 tankers with a capacity of 25,000 litres each transport the milk to the Banas Dairy co-operative plant. These tankers, starting at 11am, deliver the milk 24x7 to the plant.

Production Process

The 500 tankers deliver approximately 50 lakh litres of milk daily to the Banas Dairy headquarters in Palanpur, Gujarat; these headquarters are spread over 122 acres. There are three different units in the dairy plant. The first unit produces liquid milk, paneer (cottage cheese), butter milk, ghee, and dry powder. In the second unit, butter, milk powder, and UHT Tetra packs are processed. The third unit produces fully automated ice cream and butter. Recently, they have opened a fourth unit — a cheese plant. 50% of the milk supplied is packed into poly-packs using the above process and sold. The other 50% of milk supplied is processed into various other products like cheese, ice cream, and ghee. 11,00,000 litres of milk are used to produce milk powder, 3,00,000 litres of milk are used for cheese and UTH milk production, 1,50,000 litres of milk are used to produce yogurt and buttermilk, 1,00,000 litres of milk are used for production of paneer, and 30,000 litres of milk are used to produce ice cream.

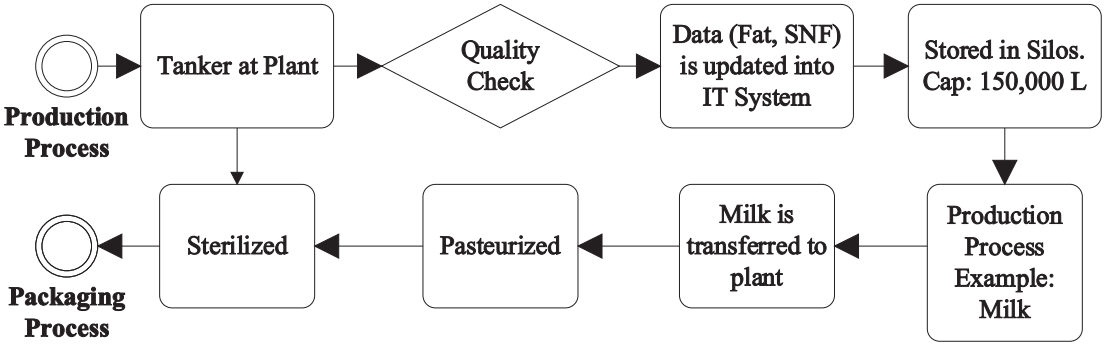

Figure 4: Production Process

As explained in Figure 4: Example of a fully automated process: On reaching the plant, the milk undergoes another quality check and the data (fat and SNF) is updated into the IT system. Then the milk is put into 26 silos which have a capacity of 1.5 lakh litres each. The next step is the pasteurising process. Here the harmful bacteria are killed, and the raw milk is made drinkable. In the pasteurising process, the milk is passed through a steel pipe and heated at 76 degrees Celsius for 15 seconds; then the temperature is reduced to 4 degrees Celsius to sterilize it. After this process, the milk is sent to the packaging area.

Packaging and Transportation Process

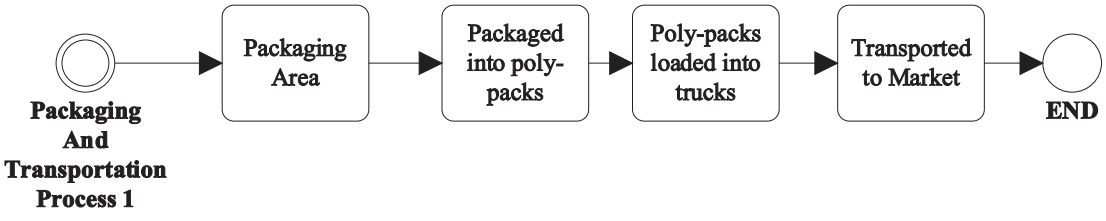

Figure 5: Packaging and Transportation Process 1

As explained in Figure 5: The milk, on arriving at the packaging area, is packaged into poly-packs. Every minute, 150 poly-packs are filled by automated machines. The packs are checked by the workers and are then loaded into trucks. These trucks transport the packs for distribution all over the states of Gujarat and Rajasthan.

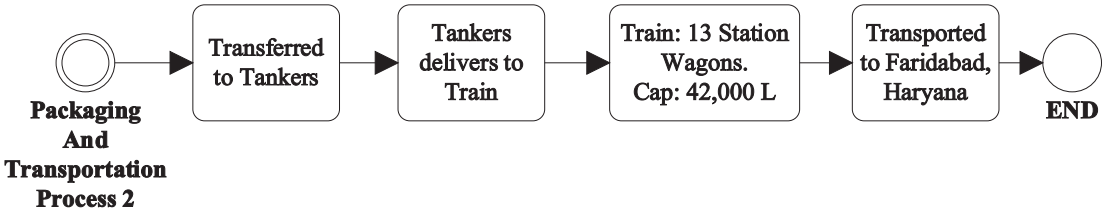

Figure 6: Packaging and Transportation Process 2

As explained in Figure 6: 10 lakh litres of milk are transported to the National Capital Region (NCR). 5,46,000 litres of milk are transported in a train to Faridabad, Haryana. The train has 13 station wagons with a capacity of 42,000 litres each. The products produced by Banas Dairy are even shipped to the Middle East and several other countries such as Singapore, Hong Kong, and the USA.

Cheese Plant

Banas Dairy has recently introduced a cheese plant. This plant also follows a fully automated process of production. The dairy spent [1] 3,50,00,00,000 on this plant and the machinery

required was imported from Italy, Germany, Sweden, and Denmark. At first, when the plant was being set up, people were under the impression that it would take at least 8 to 10 years to flourish in the Indian market. On the contrary, it took the plant only 2 to 3 years to reach its full capacity. The plant produces 30 tonnes of cheddar cheese, 20 tonnes of mozzarella cheese, and 20 tonnes of processed cheese per day.

The process of producing cheese is a very specialized process. The first step is to prepare the milk by boiling it. The temperature at which the milk is heated varies as per the cheese being produced. The next step is to separate the whey from the curd. This transforms the milk from a liquid into a semi solid or solid substance. The solid component is the curd and the liquid that remains is the whey. Here, a curdling agent such as animal or vegetable rennet is added to the milk, and the whey and curd are separated.

For producing cheddar cheese, the curd is strained and cut into blocks. Each of these blocks weighs 20kgs. These blocks are then stored in a cold storage unit for a minimum of 6 months to age and mature the cheese. In order to fulfil the market demand of 680 metric tonnes of cheddar cheese a month, the plant manager must plan 6 months in advance. The dairy earns a revenue of more than ₹ 15 crore every month from this cheese plant itself.

Additional Projects

Banas Dairy has started a few additional plants apart from their milk plant. These plants include a bee farming plant, packaged pomegranate juice plant, and a plant with a capacity of 500 metric tons for mustard, brown mustard seeds, and groundnuts. The Banaskantha region also has a good yield of potatoes. To make good use of this yield, Banas Dairy has requested Amul to market potato products like chips. They have also requested for marketing of honey since it will create a supplementary income for the farmers.

For example, Ranabhai Lalabhai Patel is one of the first few farmers who started bee farming. He only had 15 boxes to start with, which yielded 260 litres of honey. In the honey season, each box yields 6 to 7kgs of honey. Banas Dairy buys this honey at ₹ 150 per kg. So, Ranabhai made approximately ₹ 15,000 in his first season of bee farming. On analysing the process and its results, he expects to make an estimated ₹ 7 lakh in the following season. Thus, if Banas Dairy encourages more farmers to start bee farming it will help generate a greater revenue not only for the farmers, but also for the dairy.

FINDINGS

Gandhian Model

Banas Dairy has implemented the Gandhian economic model in its operations. The Gandhian model advocates diffusion of production rather than concentrating the production in the urban area only (Singh, Bawa, and Sharma, 2017). One of the principles of Gandhian economy is small scale and locally oriented production, helping common villagers grow their wealth. This principle promotes the concept of welfare for many, instead of welfare for a few. Instead of only a few people capitalising on the revenue generated, the money goes back to the society for its betterment. This is the founding principle of Banas Dairy. Even though it has a fully automated supply chain, the introduction of technology has been labour maximising and not labour saving; Banas Dairy has not made use of technology for labour displacement; instead they have looked after the betterment of not just the current milk suppliers, but also for their future generations. They have implemented automation that will maximize the efficiency and reduce the hard labour put in by the employees. Banas Dairy is a Cooperative that has provided a greater scope of employment for the villagers of Banaskantha district.

It has focused on improving the villagers' well-being by making them entrepreneurs and helping them grow along with Banas Dairy. The members are the dairy's owners, i.e. the people — the farmers who supply the milk are the board members of the co-operative. It has a pyramidal structure with 3,50,000 milk producers at the base of the pyramid. Each of these producers is a part of one of 1,281 village societies. 16 members from these societies are at the apex of the pyramid. Since the milk suppliers are on the board themselves, they know the ins and outs of the problems faced and can provide more effective solutions. The primary objective is to benefit the members and provide proper services to them. This has generated a positive effect on several socioeconomic indicators and has ensured that every dairy farmer remains self-sufficient. Thus, this Gandhian model has helped Banas Dairy become the success that it is and has also improved their turnover.

Profit Reinvestment

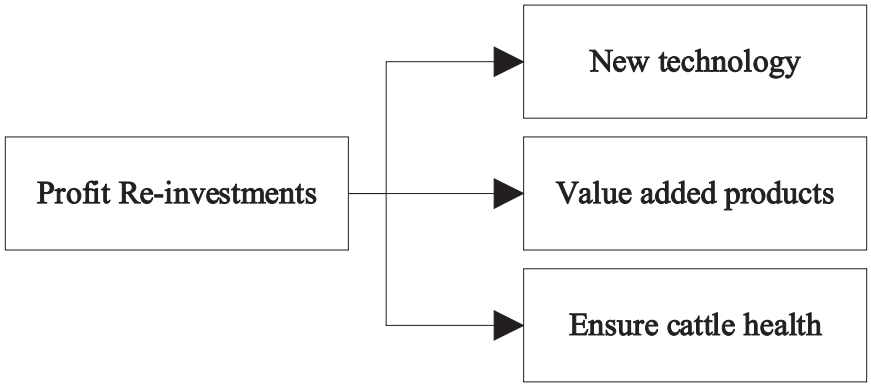

Figure 7: Profit re-investments

Figure 7 illustrates the components of profit reinvestment. In 2016, Banas Dairy had a turnover of ₹ 20,50,00,000 per day. 86% of the profits go back to improving the milk suppliers' conditions. From 1 rupee, 86 paisa are given back to the members, and only 14 paisa are used by the co-operative**.** Hence, approximately 58 billion rupees are reinvested on a yearly basis. All this money is not directly handed (cash) to the members of the co-operative; it is invested in various initiatives. They are concentrating not only on finance but also on educating the farmers and ensuring the health of the cattle. The co-operative provides free training programs like the Diva program. The Diva program is a three-year program where the milk suppliers (members) are advised and trained about cattle management. This program is available for people of all ages.

Banas Dairy offers various other schemes to its employees, like the Janshree Group Insurance Scheme, Banas Education, Banas Laxmi, and Swawlamban National Pension. The Janshree Group Insurance Scheme has been implemented to help the victims of accidental disasters between the ages of 18 to 59 and in case of death. The next scheme is the Banas Education scheme for the children of widows. The Banas Laxmi scheme has been introduced to encourage women to do scientific animal husbandry.

The cattle are supposed to be fed a nutritious and balanced diet three times a day; the meals should include proteins, fats, and minerals. For this very reason Banas Dairy has invested Rs. 138 crores and has even built a semi-automatic cattle feed plant in 2013. 14,500 cattle feed bags, each weighing 70kg, are manufactured daily. The farmers are also provided subsidies in order to buy new equipment. Thus, these milking machines reduce the farmers' milking time as well as dependence on hard labour. For example, the cost of a milking machine is Rs. 40,000 but with the subsidised rates the farmers can buy them for Rs. 20,000.

Banas Dairy has a fully automated process with zero human interference and works 24x7. The entire supply chain is fully automated from collection from villages to loading into milk tankers to transporting it to the dairy plant.

The dairy implements the best technology, which helps maintain:

- Quality and consistency in their products
- Improves efficiency
- Factory works 24x7
- Hygienic condition of plant
- Reduction in cost

In today's world of just-in-time delivery in perishable milk and milk-based products, it is necessary to maintain an effective and efficient supply chain. In order to achieve this, Banas Dairy has spent millions to operationalize high-tech machinery throughout the plant. Every year, the dairy reinvests a good amount of their profits into implementing new technology.

Along with bringing in these new machines, the employees are also trained on how to handle them. The technology is implemented across all levels including the shop floor level. Since the whole process is fully automated, the factory can operate 24x7 without any human deterrents. These machines not only reduce the milking time but also ensure proper hygiene conditions. Hygienic conditions are an important part at Banas Dairy as they produce world standard milk products. Even the milk suppliers (members) are encouraged to buy automated machines to make their work easier and faster. It improves their productivity and consistency. Thus, technology improves the end to end processes of production and helps avoid bottlenecks in the supply chain.

The addition of the bee farming model, the packaged pomegranate juice, and various other plants will aid farmers in improving their socioeconomic positions. These projects will in turn add another component to the supply chain model.

LIMITATIONS

Limitations and Their Strategic Solutions

Eliyahu (1984) defines a 'limitation' (bottleneck) as any resource whose capacity is equal to or less than the demand placed upon it. A non-bottleneck is any resource whose capacity is

greater than the demand placed on it. In other words, a bottleneck is the slowest operation or machine which determines the pace of the production, i.e. the maximum speed at which production takes place and generates money. Banas Dairy, like any other organization, faced various strategic bottlenecks. These were all related to increasing the milk yield by the members: directly and indirectly. Thus, as a strategic solution, they improved the overall system and not just the individual parts. The entire supply chain from the villages to the milk tankers to the dairy plant, was fully automated. The automation led to cost reduction, and it meant that when the yield of milk increased, the whole supply chain benefitted from it.

Table 1: Strategic Bottlenecks Vs Solution(s)

Sr. No.	**Bottleneck**	**Solution**
1.	Milk Yield	Artificial Insemination (Semen) centre opened
2.	Training Needs	Training centre opened and free training was provided to farmers and their families on hygiene and better management of the cattle
3.	Health of Cattle	Veterinary doctors visit farms
4.	Health	Latest high-tech hospital opened to provide free healthcare to farmers and their families
5.	Nutritious Cattle Feed	Factory setup to produce nutritious feed — 1,500 metric tons per day
6.	Resources	Automated milking machines at subsidized rates

Table 1: Strategic Bottlenecks vs Solution(s) summarises the bottlenecks and their solutions. These are explained below:

Milk yield*:* The first strategic bottleneck was in the form of the milk yield. A higher milk yield in terms of both, quality and quantity would be beneficial for both, the farmers as well as the dairy. Thus, in 2009, Banas Dairy opened Artificial Insemination centres. These centres would collect the semen of the healthiest cattle breed and fill it in straws. Every year, 18 lakh straws started being produced. These straws are stored in liquid nitrogen at -198 degrees Celsius. They are then used to improve cattle breeds. The hybrid breeds help increase production of milk per animal. Consequently, there tends to be a rise in the quality and quantity of milk produced. This enables the farmers to earn a higher income.

Training needs*:* The training needs of the farmers were also met by conducting various programs to educate them. These training programs did not have any age requirement. Programs like the Diva program helped improve the farmers' and their families' knowledge of hygiene and proper cattle management. The overall hygiene conditions of the plant improved the quality of the milk as well as increased the shelf life of the products produced.

Health of Cattle: The next concern was the health of the cattle. Since the cattle were the base for the entire production process, it was necessary to maintain their health. The farmer alone was often unable to provide proper treatment to the cattle. To address this concern, 165 veterinary doctors set up regular camps in all the villages. The regular check-ups ensure that the cattle are in good health.

Health*:* Along with the health of the cattle, the health of the farmers who milk them is also very important. The dairy has ensured that the farmers have a toilet in each of their homes. A hospital with the latest high-tech equipment has been set up to provide free healthcare to the farmers and their families. The free healthcare would rid the concern of affordability and would encourage the farmers to avail timely treatment. Schemes for heart diseases and untimely death have also been introduced for employees of the dairy.

Nutritious Cattle Feed*:* In order to ensure good health of the cattle and thus better milk yield, the cattle had to be fed a balanced diet. The cattle had a feed requirement of 1,500 metric tonnes per day. So, in 2013, a factory was set up to provide nutritious feed to the cattle. An investment of Rs. 138 crore was made to set up a 5-floor factory, spread over 20 acres of land. This factory operated 24 hours a day and provided necessary nutritious feed, which was imported from Denmark. Here, proteins, fats, and minerals were mixed in a specific ratio. A molasses flavour was added to this mixture, which was later converted into highly nutritious pellets. 14,500 bags, each weighing 70kgs, were filled with these pellets (feed) daily.

Resources: Training the farmers was not enough to improve the overall consistency and efficiency of the plant. They required better resources to work with. On average, it takes a farmer approximately 3 hours to milk 35 cows. In order to make the milking process easier and faster, high tech machinery was introduced. The only problem here was affordability. Even though the farmers realised the benefits of using automation, they were unable to buy the necessary equipment. Thus, Banas Dairy provided the farmers with subsidies so that they could buy the required automation. These subsidies encouraged farmers to upgrade their methods of milking and to make good use of the technology available. For example, the farmers were able to purchase automated milking machines for just Rs. 20,000, even though

the market price of the same machines was double this price. Due to this, farmers were able to supply a larger quantity of milk in a shorter amount of time, improving their efficiency and increasing the output. It even improved accountability and visibility. The dairy, in order to function like a well-oiled machine, needs a clear sight of the current production as well as the ability to foresee the potential delays or problems it might face. With the use of technology, there is an added element of transparency in the whole process, and the information and material flow have increased.

CONCLUSION

Banas Dairy was instrumental in achieving optimized growth and will continue to grow as it has optimized its strategy, operations, business processes, and technology template. Banas Dairy is located in the Banaskantha region of Gujarat; a region which is mostly barren. The dairy is like an oasis for the inhabitants of this region. Because of a cooperative structure, these villagers supply the required raw milk and ensure optimum growth by benefitting the entire eco-system and supply chain. In order to increase their work efficiency, high tech resources are provided to them at subsidized costs.

Growth in the dairy industry can be achieved by using the models and processes as defined in the case study. In this paper, a high-level supply chain process model of a dairy — the Banas Dairy in Gujarat — India is studied. The supply chain includes four major components — farmers, raw milk, dairy plant, and customers. It is an integrated system wherein several entities like the suppliers, manufacturers, distributors, and customers work together in order to manage the material flow as well as the information flow.

IMPLICATIONS

The Banas Dairy has taken the processes and the science from the ivory tower of academics and put them within the reach of common people in the dairy industry. It showcases that growth can be achieved with a logical and precise outlook at processes, simplifying them and overcoming the inconsistencies.

By challenging the basic assumptions of day-to-day processes and supply chain handling, Banas Dairy was able to make a breakthrough. It was achieved by combining an automated process with the strengths of the Gandhian model.

Any company or cooperative in the dairy industry can implement these operations and high-level business processes for faster and optimized growth. This study of high-level processes

and detailed processes and systems can be implemented by the management as per their evaluation of the availability of options and the ground reality.

The synergy of the supply chain processes will aid in maintaining quality, consistency, and a reduction in the cost of the dairy products. Banas Dairy's integrated system can enable the dairy industry to establish an effective and efficient world class supply chain anywhere in the world.

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