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## **Grameen Danone Foods Limited (GDF)**

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### **Abstract**

This case describes Grameen Danone Foods (GDF), a fresh dairy product company in Bangladesh that was founded in 2007. GDF is the result of a joint venture between Groupe Danone, a multi-national corporation, and the Grameen Bank, a Bangladeshi non-governmental organization (NGO). GDF collects milk from many small dairy farmers and produces yogurt products for distribution through both rural and urban channels. The issues, challenges and opportunities highlighted in the case are relevant for students and industry professionals. The SWOT (Strengths, Weaknesses, Opportunities, Threats) framework is ideal for analyzing the content of the case; this may then be used to create future plans, for the business as a whole and specifically in the areas of marketing and operations.

**Keywords:** teaching case, social entrepreneurship, Bangladesh, yogurt, dairy industry

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### **IFAMA Agribusiness Case 15.1**

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## **Introduction**

After a four-month hiring process and a 30-hour plane trip, Luc Jeanveaux is on a bus finishing the last leg of his journey to his new job. Having just completed his MBA, he will start work as the General Manager of Grameen Danone Foods (GDF), a Bangladeshi yogurt company that is co-owned by Groupe Danone (GD) and the Grameen Family of Enterprise (GFE).

As General Manager (GM), Luc will supervise the 100 operations, sales, and administrative staff who work in the Bogra facility. His responsibilities will include overseeing production, equipment maintenance and the collection, storage, and transportation of fresh milk from more than 100 contract dairy farmers. Luc reports directly to the Managing Director (in U.S. corporations, this is the equivalent of the Chief Executive Officer or CEO), who is based at the Dhaka headquarters. As the highest-ranking GDF official at the Bogra plant, Luc is an important link between operations in Bogra and headquarters in Dhaka. As a result, he plays several roles including:

1. Linking the supply side of the business (supply chain and operations) with the demand side (sales and marketing).
2. Ensuring that raw milk supply from internal vendors meets daily production requirements so that milk does not need to be purchased on the spot market at a higher price.
3. Identifying supply chain risks and developing extension services (veterinary, consulting, and financial services) that will help to mitigate these risks.
4. Communicating to the managing director when the cost of goods sold increases so that product and pricing adjustments may be made.

The job of GM is clearly demanding and Luc is the third person to hold the post since operations began in 2007. His predecessors and the board prepared a packet of information related to GDF's internal performance, the dairy industry, the agricultural sector, Bangladesh's macro-environment, and consumer market. After flipping through the packet, Luc knew that he would need to manage multiple issues at once and that some responsibilities would need to be prioritized over others. Knowing that there is no time like the present, Luc watched the bus pull away from Dhaka's busy terminal. He took a deep breath and reviewed the materials one last time.

## **Groupe Danone**

GD was founded in 1919 in Barcelona, and is now the world's largest producer of fresh dairy products with more than 80,000 employees. Danone (Dannon) yogurt has long been GD's flagship product, but it also owns bottled water, baby, and medical nutrition brands. In 2009, total global sales were more than US\$21 billion and it had a 15 percent profit margin (Groupe Danone 2010). In the past decade, GD has expanded aggressively into emerging markets with sales in these markets growing from 6 percent in 1999 to 42 percent in 2009. (Manners 2009). The GD CEO, Franck Riboud, promoted GDF as a mechanism for GD to expand into a new, large Asian market and to provide its nutritional fresh dairy products. In October 2005, Riboud discussed his ideas with Muhammad Yunus, the Grameen Bank chairman. Shortly thereafter, the

memorandum of understanding was signed, and GDF became GD's first investment in Bangladesh.

## **Grameen Group of Enterprises and Grameen Bank**

The GFE began in 1976 as a project in collateral-free lending initiated by Muhammad Yunus, an Economics professor at the University of Chittagong in Bangladesh. The GFE is a diversified group of enterprises that operates in the banking, healthcare, energy, education, agribusiness, and textiles industries among others. In 1983, the Grameen Bank was formed as a government-sanctioned bank. Over the years, this micro-finance organization has disbursed more than US\$10.5 billion in loans, mainly to rural women. The Grameen Bank (GB) now has 8.37 million members and more than 25,000 branches. In 2010, the total average monthly loan disbursement was about US\$120 million. About 27 independent sister-concerns of the GB have been formed in industries that vary from health and energy to agribusiness to ready-made-garments. Because most of its borrowers are based in rural areas, GB has developed specialized loans and extension services to serve farmers. The Grameen Livestock Foundation (GLF), founded in 1997, is around 50 km from the Bogra factory and targets financial and extension services for dairy, poultry, and fish farmers. GDF is the GFE's first partnership with a multi-national corporation and its first investment in dairy processing (Grameen Bank 2011).

## **The Design Phase**

With the active support of GD's CEO and the GB chairman, GDF was able to quickly move through the initial planning phase. The vision for GDF was to create up to 50 factories that provide fresh and healthy dairy products to Bangladeshis by 2020. According to Maurel (2009), GDF's four primary objectives are to:

- Provide health through nutrition at affordable prices to all Bangladeshi children.
- Improve living conditions of the poorest members of the community by involving them in all stages of the business model including supply, production, sales, job creation, and improving local competencies.
- Preserve non-renewable resources as much as possible.
- Become profitable to ensure economic sustainability.

Previously, GD produced yogurt using a centralized model in which a few large dairy farms provided milk to a centralized production facility that processed it into yogurt and distributed to retailers and wholesalers. In Bangladesh, a number of environmental factors prompted GDF to adopt a *proximity-based business model*. A proximity-based model works to bring supply, production, retail, and consumption of a product as close to one another as possible.

GDF redesigned the typical yogurt factory supply chain to serve dairy farmers with around five cows and little or no access to electricity for refrigeration. It also focused on building high sales penetration and repeat customers in the rural areas around the factory. It hires door-to-door salespeople to sell yogurt from refrigerated coolers in these areas. In addition, GDF distributes to convenience stores and supermarkets in Bangladeshi cities and towns.

## **The Bogra Plant**

Guy Gavelle, Groupe Danone's Industrial Director for Asia-Pacific Operations, managed the design and construction of GDF's first factory in Bogra (Exhibit 1, see Appendix). The Bogra facility, which was quite different than the typical GD factory in terms of location, size, and workforce, presented several unique design challenges for Gavelle: (Yunus 2010a).

- Product – the factory needed to maintain GD's high food safety standards throughout the production of the Shokti Doi brand of yogurt (Exhibit 2, see Appendix).
- Durability – the equipment needed to be durable and dependable enough to be operated and maintained in remote locations that have limited access to replacement parts.
- Lower Capacity – the factory would produce a fraction of the output of GD's other plants but maintain the same quality standards.
- Different Labor Usage – production processes should be both labor intensive and simple enough to be performed by a low-skilled workforce.
- Distribution and Sales – the plant must include a cold storage distribution center and office space for regional sales and administration staff.
- Environmentally Friendly - the Bogra facility needed to include equipment and processes for wastewater treatment, recycling, rainwater harvesting, solar water heaters, and a biogas generator.

GD broke ground on July 14, 2006 and equipped the plant with yogurt processing and refrigeration equipment imported from China and India and stainless steel tanks and pipes that were locally fabricated. Construction took about six months to complete; commercial production began in January 2007. While other Danone factories can be more than 75,000 square feet with an annual capacity of more than 100,000 tons, the Bogra factory is about 7,500 square feet with an annual capacity of 3,200 tons, or about 8,000 liters per day. The total cost of the plant was about US\$1 million – US\$50,000 for land and US\$950,000 for the facility (Jeanveaux 2010).

## **Sales Performance 2007 to 2010**

During the first half of 2007, the Bogra plant ran smoothly, and product feedback was generally positive. However, after the initial push, sales growth began to stagnate. GDF's urban sales focused on about 100,000 households in the city of Bogra, but it was only able to distribute to 300 to 400 stores that had adequate refrigeration facilities. This limited the growth potential for GDF's urban sales channel unless it expanded to other towns and cities.

Meanwhile, the rural areas around Bogra represented huge growth opportunities with 650,000 households, spread over more than 2,500 villages (BBS 2007). The rural sales program, consisting of door-to-door salespeople, was designed to provide supplemental income to rural women and introduce the yogurt to rural consumers, similar to the Avon selling model. However, during the first half of 2007, it attracted only about 30 saleswomen and GDF's rural sales volume seemed to be stuck at 3,000 cups per day. In response, GDF hired a full time GM from Bogra who had experience working in the region. It also hired consultants to audit GDF's rural sales and identify areas for improvement. The consultants noticed that GDF's training process failed to engage the families of the saleswomen, especially their husbands. This

prompted GDF to launch a new recruitment, selection, and training program that focused on engaging the entire family and effectively communicating the potential economic benefits of being a successful salesperson. The company also responded to consumer taste tests by increasing the sweetness of the yogurt.

These adjustments worked; the rural sales force grew from 29 in September 2007 to 270 in March 2008 and it enjoyed six months of sustained sales growth (October 2007 to March 2008), primarily due to increases in rural sales. In several villages, GDF was selling to 50 percent of the households. This seemed to validate the proximity-based model. After its first year, GDF was not operationally profitable but was able to quickly address internal issues and build sales growth that placed it on a path to profitability (Yunus 2010a).

Unfortunately, this success was short-lived. By mid-2008, global food commodity and petroleum prices were at all time highs. In addition, Bangladesh faced two consecutive years of exceptionally bad monsoon floods. These factors caused milk prices to double between 2007 and 2008. By March 2008, the razor-thin margins were totally eroded and GDF was losing money on each sale. In April 2008, GDF raised the price of an 80-gram cup of yogurt from 5 to 8 taka (70 taka is equivalent to about US\$1). The price increase caused sales in rural areas to decline by 80 percent and urban sales by 40 percent. GDF's rural sale force also dropped back to around 30 people.

In June 2008, GDF reacted by introducing a smaller (60 gram) package with the same nutritional value as the larger package and priced at 6 taka. It also launched promotional events and nutritional programs to rebuild the brand's image and introduced new packaging and pricing. It built its rural sales strategy around 35 committed saleswomen who were given daily sales targets of 50 cups and expected to work about seventeen days each month.

GDF also began selling its 80-gram packages to other towns and cities in the Rajshahi District and eventually as far away as Dhaka. The price point for provincial towns was 8 taka while yogurt in Dhaka was priced at 12 taka. GDF also introduced a mango-flavored yogurt and began developing a yogurt drink that did not require refrigeration. In September 2008, GDF re-branded its yogurt as Shokti+. Removing the word "doi," which means yogurt, gave GDF the flexibility to expand into products other than yogurt. In March 2009 GDF launched a nationwide television commercial campaign that resulted in large urban sales increases (Yunus 2010a).

These adjustments put GDF back on track. In 2010, monthly sales volume was approximately 100 tons or over 800,000 cups of yogurt. It also introduced a liquid yogurt product that comes in a sachet and requires minimal refrigeration. This product was priced for the lowest income consumers at 5 taka for 50-milliliters. GDF now employs around 900 saleswomen who provide the company with about 20 percent of total sales. The remaining sales come from a network of small shops in provincial towns in the Rajshahi district and supermarkets in Bangladesh's large cities, including Dhaka, Sylhet, and Chittagong. In 2010, the Global Alliance for Improved Nutrition (GAIN) and Johns Hopkins University began a nutritional impact assessment of GDF's products. If current trends persist, the Bogra plant could be operating at capacity sometime in 2011 (Exhibits 3 and 4, see Appendix) (Yunus 2010b).

## **The Available Market**

Bangladesh is home to over 150 million people or roughly 25 million households. The population is spread across seven divisions, which are sub-divided into 64 zilas (districts). About 70 percent of the population is concentrated in three divisions: Dhaka, Rajshahi, and Chittagong. Bangladesh's small landmass and large population make the country one of the world's most densely populated nations with almost 3,000 people per square mile. Over 50 percent of the population lives in more than 8,000 villages or impermanent settlements called chars (riverbanks and sandbars) that are adjacent to Bangladesh's many rivers (UNESAP 2008). The country's six official incorporated cities – Dhaka, Chittagong, Khulna, Rajshahi, Barisal, and Sylhet – are home to over 20 million people. More than 60 percent of these people live in Dhaka with an additional 20 percent in Chittagong. The remainder of urban Bangladeshis lives in over 200 smaller municipalities around the country (BBS 2010).

While aggregate household expenditures were greater than US\$26 billion in 2005, there is great income inequality. About 94 percent of Bangladeshi households earn less than the equivalent of US\$3,000 per year (BBS 2010). They participate in a market that is characterized by significant unmet needs, dependence on informal or subsistence livelihoods, and high prices for basic products and services (relative to the prices paid by upper income segments (Hammond 2007). About 45 percent of all households earn less than US\$2 a day, and 80 percent live in rural areas. These households account for only 26 percent of total national expenditure (US\$6.6 billion). The upper 20 percent of households account for 40 percent (\$10.6 billion) of household expenditures, and the upper five percent of households represent 16 percent (US\$4.2 billion) (BBS 2010). Culture, history and geography play an important role in the nature of the market (Exhibit 5, see Appendix).

## **Expenditures on Food**

Food represents the largest expenditure for Bangladeshis and accounts for 36 percent of the expenditures of the wealthiest households and 65 percent of the poorest families. By contrast, Americans spend an average of 13 percent of total expenditures on food (BLS 2009). Over 14 million Bangladeshi households spend less than 700 taka (US\$10) a week on food, over 8 million households spend less than 1000 taka (US\$14.29), and the wealthiest 3 million households spend more than 1,100 taka (US\$15.71) (BBS 2010). With such a high share of income committed to food, Bangladeshis are highly sensitive to price changes. For example, the drastic increase in food prices in early 2008 forced many middle class households to purchase government subsidized food. During this time, there were also nationwide demonstrations for higher wages and lower prices (Exhibit 6, see Appendix) (Dummet 2008).

The 2008 food crisis underscores systemic food insecurity challenges in the country that disproportionately affect the poorest income segment. Small farmers and laborers tend to have less income in the months leading up to the harvest season. In northwestern Bangladesh, the time before the November and March rice harvests is known as *monga* and characterized by serious reductions in food intake (Zug 2006). If a harvest is delayed or destroyed by a natural disaster, nutrition is further degraded, often forcing families to decide between migration and

starvation. This cycle has been a major contributing factor to socioeconomic underdevelopment in many parts of Bangladesh.

## **The Dairy Market**

In 2005, Bangladesh produced about 2.27 billion liters of dairy products. Annual milk production tends to peak in the dry season (October to March) when there is more land available for grazing (Parves 2010). Liquid milk and milk equivalent products (e.g. powdered milk) represent more than 90 percent of total consumption, and products from processed liquid milk (e.g. yogurt and butter) account for an additional five percent (BBS 2010). A 2003 sample of 300 consumers from different geographic areas and economic groups found that roughly 44 percent of poor Bangladeshis had consumed milk in the prior three days compared with 69 percent of middle class consumers, and 88 percent of rich consumers. In villages, about 60 percent of the sample had consumed milk in the past three days versus 43 percent in urban slums, and 73 percent in the char (riverbank areas). When a family purchases milk, it was usually shared among all members. However, when there is a limited supply, children under five are usually given preference. Poor families spent about 3.5 percent of their daily food expenditures on milk, while middle class families spent eight percent, and rich families six percent (Halder and Barua 2003). In general, milk sales increase during the forty days of Ramadan and the two annual Eid festivals. Between 2003-04 and 2005-06, total milk production in Bangladesh grew by six percent. With a growing middle class, the trends toward increased milk consumption should continue (Exhibit 7, see Appendix) (Parvez 2010).

Milk and other dairy products are acquired through three primary channels: (Halder and Barua 2003).

- Self-production – up to 30 percent of milk-consuming households in villages and 69 percent of families living in chars (riverbank areas) produced their own milk.
- Informal market – buying from neighbors, door-to-door salespeople, and street vendors accounted for an additional 50 to 60 percent of consumption in villages, 29 percent in slums, 24 percent in char areas, and about 49 percent for middle class consumers.
- Fixed market sales – milk purchased from formal retail outlets represented less than 20 percent of village sales, over 70 percent of slum sales, and over 30 percent for upper and middle class consumers. With more supermarkets in cities around the country, middle and upper class consumers are increasingly purchasing milk through established retail outlets.

## **The Milk Industry**

### *Raw Milk*

Milk is typically purchased from town bazaars where 100 to 150 farmers bring one to five liters of milk to sell directly to local households or small businesses. Sales for household consumption are usually less than one liter, but sales to small businesses can exceed 50 liters per day. The price of raw milk varies greatly depending on location and season. For example, in late-2010 the price for milk in a market town in rural Rajshahi division was 25 taka (US\$0.36) per kilogram versus 45 taka (US\$0.64) per kilogram in a bazaar about 40 kilometers from Dhaka.



Alternatively, members of cooperatives or contract farmers will bring their milk to a collection center, which typically collects around 1000 liters of milk per day. The collection center staff tests the milk for quality and pays the farmer a fixed price of 26-30 taka (US\$0.37-US\$0.43) per kilogram. The milk is then placed into 40-liter containers and transported by bicycle van to a chilling facility. Chilling centers are located in areas with regular electricity with storage and cooling equipment that can handle 1,500 to 11,000 liters of liquid milk. Depending on capacity, the chilled milk is loaded into a car or tanker and taken to the processing facility. The collection and chilling center staff and drivers are either paid fixed rates or on commission (Jeanveaux 2010).

### *Traditional Processing*

Traditionally, milk is processed into solid butter, liquid butter (ghee), yogurt, and milk-based sweets. Milk-based sweets are popular during festivals and special events such as weddings. Historically, Hindu “Ghose” families operate sweet shops that specialize in producing and selling products like sweet yogurt (mishtee doi) and other milk-based sweets. These sweets are one of the primary uses for processed milk. While the current sweet-making industry is no longer solely dominated by Ghoses, traditional sweet-making processes remain relatively unchanged. Milk-based sweets are usually produced through a process of boiling milk, curdling it into a solid form, and mixing it with additional ingredients. Small village sweet shops usually have a single boiler and oven while popular urban shops can have up to 15 boilers and sell more than 1000 units per day. Yogurt is traditionally sold in handmade clay pots, and other sweets are sold by weight and packaged in cardboard. While most sales take place in the same location as production, several factories in districts just outside Dhaka distribute to retail outlets in the city (Asia Sweetmeats 2010).

### *Modern Processing*

Bangladesh is also home to a large and growing modern milk processing industry with the top nine processors employing over 80,000 dairy farmers, 1,200 permanent employees, 2,000 collectors and transporters, and 100 distributors (Halder and Barua 2003). Processors usually have centralized facilities located in rural areas with equipment for large-scale pasteurization, storage, processing, and packaging. While processing and packaging pasteurized milk is the primary focus of these facilities, they can also make milk powder (a milk product that does not require refrigeration), ice cream, and many of the same products as traditional processors (ghee, sweet yogurt, liquid yogurt, and other milk-based sweets). As milk consumption increases in Bangladesh, the supply of raw milk struggles to keep pace; this leads to price fluctuations and creates an environment where speculators manipulate supply and prices. Limited domestic supply has also forced Bangladesh to import milk powder from countries such as India, Australia, and New Zealand. Since 1994, the prices paid for raw milk by processors have more than doubled. Milk is packaged in ½- and 1-liter containers, while milk products like yogurt are packaged in sealed plastic tubs. Once packaged, refrigerated trucks transport products from the plant to a distribution point, where bicycle vans or smaller vehicles pick up the products for retail store delivery (Exhibits 8 and 9, see Appendix).

## **Competitive Landscape**

The processed dairy market is dominated by two organizations – MilkVita and BRAC Aarong. Until 1994, when private competitors began entering the market, MilkVita had virtually 100 percent of the total market. MilkVita now controls about 60 percent of the market while BRAC controls 20 percent. BRAC began operating in 1998 as a way to increase incomes for dairy farmers. Approximately seven other enterprises account for the remaining 20 percent of the market. There are several government-owned farms around the country that have quality facilities and livestock, but mismanagement and corruption have plagued these facilities in recent years; they now produce a negligible share of Bangladesh's processed milk (Exhibits 10, 11, and 12, see Appendix).

## **GDF Supply Chain**

GDF's raw milk supply chain does not differ greatly from that of the competition. Milk is collected from dairy farmers at kiosks that are located near the dairy farmers. Farmers are paid a fixed price for milk upon delivery to the collection center. Raw milk is brought to a chilling facility in the morning and evening by bicycle rickshaw and is stored at the facility until a truck picks it up and brings it to the factory. The collection and chilling centers are either owned by GDF or by milk collection partners. In addition to milk, GDF needs to source sweeteners and nutritional supplements in order to make its yogurt. Date palm molasses, which is prevalent in the Rajshahi Division, is GDF's primary sweetener and a popular sweetener for other Bangladeshi foods and beverages. The yogurt also includes iron, calcium, vitamin A, and iodine nutrients that are typically imported from Europe. The finished yogurt is then packaged in plastic cups or sachets (Exhibits 13, 14, and 15, see Appendix).

## **GDF Promotion**

### *The Grameen Brand*

With operations throughout the country and in multiple sectors, Grameen has become a trusted brand name for Bangladeshi consumers. When the Grameen Bank and founder Muhammad Yunus were awarded the Nobel Peace Prize Award in 2006, the brand also became a source of national pride. GDF's marketing strategy leverages the nationwide recognition and trust associated with the Grameen brand in its advertising and promotional campaigns. The current marketing strategy dates back to late 2008 when GDF decided to expand distribution to Dhaka and other cities. It executed this expansion with a series of television commercials that ran in March, May, and September of 2009. Several of these commercials featured Yunus, who highlighted the social objectives of the program and the health benefits of Shokti+ for children. Outdoor advertising in urban areas was also used to promote the brand in towns and cities. The increased sales volume that followed the commercial and advertising campaign seem to indicate the success of the campaign.

### *Promotional Events*

To stimulate rural sales, GDF trains event teams who travel to villages and schools to promote Shokti +. Event teams usually include a man, a woman, and one of the saleswomen. The male team member dresses up as the Shokti + lion and goes around the village convincing people, especially children, to attend the event. This spectacle easily draws a crowd of 50-100 people who gather in the village center. At this point, the other team member begins discussing the health benefits of Shokti + and the objectives of the organization. After a 15-20 minute presentation and several free samples, people are directed to the saleswomen to purchase yogurt. These events help saleswomen quickly introduce Shokti + in new villages and can generate sales of 100 or more cups in a single event. In 2009, GDF hosted 1,270 events and employed 16 teams for rural promotions (Yunus 2010b).

### *Point-of-Sale Promotion*

GDF has also introduced effective, point-of-sale marketing strategies. In early 2010, the company introduced a promotion in which each yogurt purchase came with a free sticker and purchasing multiple cups came with a free ruler. Saleswomen, supermarkets, and small retail stores all mentioned that sales volumes were higher during these promotional periods and dropped when they ended. Volume-based promotions are also used by GDF and have increased sales by up to 20 percent in some supermarkets. During visits to the Agora, G-Mart and Prince Bazaar supermarkets in Dhaka, prize and volume discount promotions were all observed.

### *Bad-Press & Muhammad Yunus' Retirement*

While these marketing and promotional activities have successfully increased sales, bad press and political ill will threaten Grameen's brand equity. In 2006, Yunus declared his intentions to start a party and run for Prime Minister. This decision earned him some powerful enemies including the current Prime Minister, Sheikh Hasina. In late 2010, a Danish documentary exposed what it claimed were irregularities in Grameen's use of Norwegian aid dollars. While Norway's aid agency made assurances that the money was used correctly, the scandal drew a lot of attention in Bangladesh. Hasina used the bad-press to her advantage and stated that "micro-lenders [like Grameen Bank]...are sucking blood from the poor in the name of poverty alleviation...there has been no improvement in [their] lifestyle...[the poor] were just used as pawns to get more aid" (Financial Express 2010a). In May 2011, Muhammad Yunus retired as the GB chairman to diffuse the situation. It is unclear what will happen to the GFE without its dynamic and visionary founder.

## **GDF Distribution and Sales**

GDF's decision to expand distribution within the Rajshahi Division and into Dhaka was a shift in distribution strategy that had an immediate impact on sales. The Bogra plant production volume was expected to grow from 22 percent of capacity in 2009 to 54 percent in 2010 (Yunus 2010b). Today, the cities of Dhaka, Sylhet and Chittagong account for 50 percent of sales volume, rural sales through village saleswomen represent about 20 percent of sales, and towns and cities in the Bogra area account for about 30 percent.

### *Rural Sales*

The execution of rural distribution through door-to-door sales has evolved greatly over the years. The importance of training, family engagement, goal setting, and promotional support have proved to be critical to success. Even though rural sales require the most effort and represent the smallest share of sales volume, there is a huge market potential in this channel. A driver and GDF employee, using a three-wheel mini-taxi, deliver inventory to about four to five women per trip. Depending on sales volume, 100 to 150 cups and sachets of yogurt are delivered up to three times per week. It takes about four to five hours to deliver the yogurt to salespeople. Sales volume varies from person to person and from village to village. Daily sales volume ranged from 35 to 150 units during a field visit in November 2010. Salespeople who work directly with promotional teams and commit a large share of their time to selling typically have the highest sales volume. Saleswomen reported that the biggest barrier to increasing sales was price and that lowering the price from 5 to 3 taka would be necessary for the yogurt to be affordable to the majority of rural consumers. GDF is also exploring distribution partnerships with Unilever and the NGO CARE for the rural channel (Jeanveaux 2010).

### *Regional Sales*

GDF sales in the greater Bogra region target about 4,000 retail stores. Retail stores are identified and contracted by a remote sales force of about 20 people based in towns and cities that are easily accessible by highway from the Bogra plant. Once there is enough demand in a town or city, GDF focuses on securing contracts with other retail stores located along the same route. This strategy enables drivers to make 40 to 50 deliveries per trip without leaving the highway. GDF then hires individual drivers or distribution companies to make these deliveries. The yogurt is collected at the factory in the morning from about 7:30 to 9:30 a.m. and transported by 3-wheel taxis with a capacity of 1500 units, small vans with a 4,000-unit capacity, and large vans with capacity of over 8,000 units. Deliveries can take anywhere from three to nine hours to complete. Using this same strategy, GDF is in the process of expanding distribution further south into the Khulna Division.

### *Urban Sales*

Urban sales in Dhaka, Sylhet, and Chittagong have quickly become GDF's largest distribution channel. Initially, GDF is focusing on supermarkets, which target middle- and upper-class consumers. An average supermarket is over 3,000 square feet with a large refrigerated food section; more established food retailers might operate four or more stores. Depending on location and season, a supermarket can sell 100 to 400 cups of yogurt per day. Promotions have also proven very effective and can increase sales volume by up to 20 percent. Orders are communicated directly between the supermarket and GDF sales staff with deliveries to Dhaka, Sylhet, and Chittagong every two to three days in a refrigerated vehicle that has a 100,000-cup capacity. While there are a growing number of supermarkets in these cities, most consumers still purchase food in small shops located in neighborhoods or a central bazaar. If GDF can successfully expand distribution into smaller retail stores, sales growth in Dhaka, Sylhet, and Chittagong could grow even faster.

## Looking Ahead

Luc's bus is reaching the outskirts of Bogra and the patchwork of fields begins to give way to concrete. Luc is apprehensive about the challenges he will face and equally unsure of what he will do. In spite of everything, he is confident in himself and his training and; he is looking forward to his first day on the job.

Some of the most pressing questions he plans to answer include:

1. What is the company's current strategy?
2. What has worked and what has not worked?
3. What are some of the risks as GDF grows?
4. In 2011, South Asia has faced inflation rates similar to 2008. How should GDF address volatile milk prices and seasonal fluctuations in supply?
5. How can GDF increase sales to low-income consumers and sustain its current sales growth to urban segments?
6. Which sales channels should GDF focus on and what strategy should it use?
7. What improvements could be made to the supply chain to reduce cost and increase efficiency?

In two weeks, the Managing Director will come to Bogra and Luc will have a chance to present his plans. He wants to make a good impression and he believes that if the Managing Director likes what he has to say, he will get to present his plan to the board next month. He knows that if the board, including GD's CEO, Franck Riboud, and the former Grameen Bank Chairman, Muhammad Yunus, is receptive to his plans, he will be given the authority and resources to implement his plan.

## Assignment

- Develop a plan or recommendation for Luc to present to the GDF board.
- Support your recommendation using the appropriate data and analysis.

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## Appendix

### Exhibit 1. Why Bogra? (Yunus 2007)

Bogra was chosen for a number of strategic reasons:

- It is within 250 kilometers of Dhaka, Bangladesh's economic and political hub. Around 250,000 people live in the district of Bogra (solid red in map below) and about 35 million live in the Rajshahi Division, of which Bogra is a part.
- The division is strategically located in Bangladesh's northwest region and well connected with the rest of the country by rail and road transport. The Indian state of West Bengal is on Rajshahi's western border and the Rangpur, Khulna, and Dhaka divisions are the north, south, and eastern borders respectively. The Jamuna (Brahmaputra) River defines Rajshahi's eastern border and the Padma (Ganges) River creates the southern border.
- In the dry season, the banks of these river systems are ideal for dairy cow grazing. As a result, much of Bangladesh's dairy industry is based in the Division.
- Bogra is known as having some of Bangladesh's best yogurt and other milk-based sweets.
- The region also has high rates of malnutrition, providing GDF an opportunity to measure the impact of its yogurt on health.











**Exhibit 2. The Product**

The flagship product needed to be nutritious, affordable, and tasty. The International Centre for Diarrheal Disease Research Bangladesh (ICDDR, B) helped GDF determine the ideal product characteristics for a food product for undernourished children. ICDDR, B's Director, Dr. David Sack, recommended developing a product that could compete with the rice gruel traditionally fed to children. Yogurt was chosen for a number of reasons:

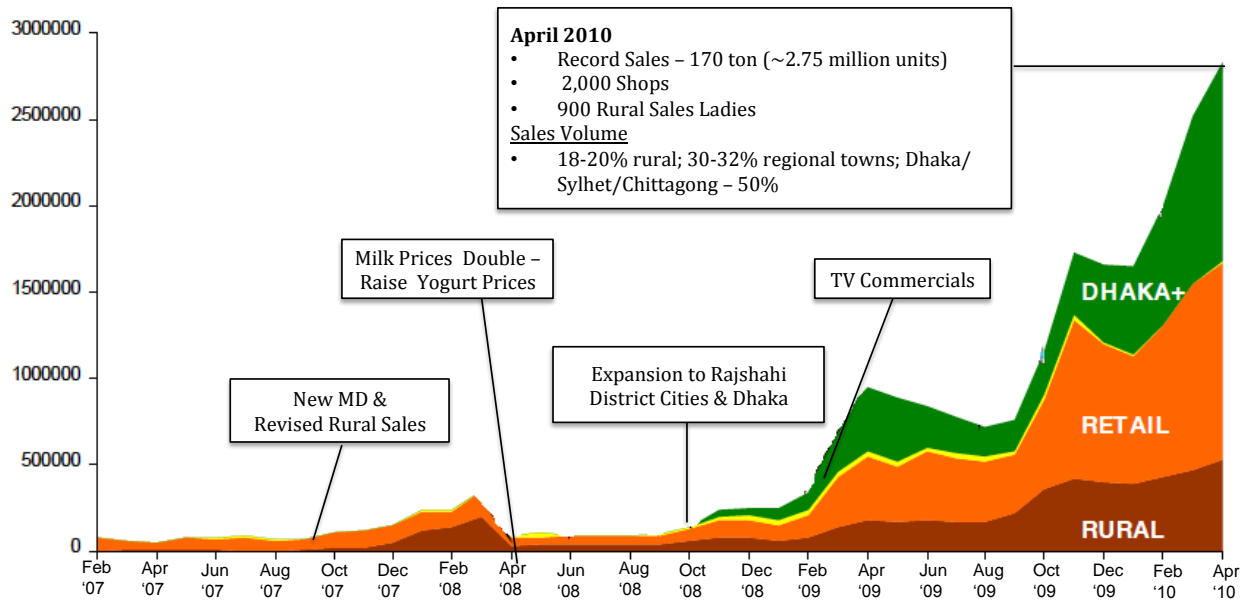
- It leveraged GD's global leadership in the yogurt product category.
- Yogurt is a popular and traditional Bangladeshi food product and imported packaged yogurts not affordable for the majority of Bangladeshis.
- Studies indicate that the live cultures in yogurt can decrease the duration and severity of diarrhea, which kills thousands of Bangladeshi children a year (ICDDR, B).
- GDF felt that it could adjust the yogurt recipes to include the necessary nutrients without sacrificing taste.

The final product was branded as Shokti Doi, which means yogurt for power with a lion as the company mascot. The formula includes 3.5 percent milk, local date molasses sweetener, and 30 percent of a child's daily needs for essential nutrients like iron, calcium, vitamin A, and iodine. It was packaged in plastic containers and initially priced at 5 taka (7 cents) for an 80-gram cup (Yunus 2010b).

<b>Products</b>						
<b>Description</b>	Plain 60 gram	Mango 60 gram	Plain 60 gram with extra Protein	Plain 80 gram	Mango 80 gram	Pouch 40 gram
<b>Price (in taka)</b>	6	8	8	12	12	5
<b>Distribution Area</b>	Villages and NGOs in Rajshahi and Rangpur	Villages in Rajshahi	Dhaka and Chittagong	Dhaka, Chittagong and Sylhet	Dhaka Chittagong and Sylhet	Rajshahi and Rangpur

### Exhibit 3. GDF Sales Performance (Yunus 2010b)

#### CUPS SOLD



**Exhibit 4. GDF Financial Performance and Projections (Yunus 2010b)**

In thousands of taka, except for total volume

	Actual	Actual	Budget			Forecast		
	2008	2009	2010	2011	2012	2013	2014	2015
<b>Total Volume ('000 cups)</b>	148	696	1,727	3,200	3,200	3,200	3,200	3,200
<b>Revenue</b>	10,455	52,340	142,834	282,351	284,013	290,408	292,927	292,747
<b>Raw Materials &amp; Packaging</b>	8,421	44,311	101,576	160,406	163,291	158,063	155,075	155,288
<b>Gross Margin</b>	2,034	8,029	41,258	121,945	120,722	132,345	137,852	137,459
<b>Plant Expenses</b>	9,183	13,058	18,210	21,462	23,873	24,865	25,757	26,620
<b>Supply Chain Expenses</b>	1,451	7,996	13,998	26,117	22,721	20,329	17,576	17,565
<b>Operating Margin</b>	(8,600)	(13,025)	9,050	74,366	74,128	87,151	94,519	93,274
<b>Advertising &amp; Promotion</b>	3,568	8,196	14,069	45,176	38,058	29,041	29,293	29,275
<b>Sales Overhead</b>	2,282	10,176	21,730	32,024	24,703	19,589	17,417	1,477
<b>Head Office Overhead</b>	6,503	7,920	16,642	19,428	18,970	17,575	15,683	12,308
<b>Net Profit</b>	(20,953)	(39,317)	(43,391)	(22,262)	(7,603)	20,946	32,126	50,214

## **Exhibit 5. About Bangladesh**

### *Geography*

Bangladesh is located in the eastern part of Bengal, a linguistic and cultural region of the Indian subcontinent. The country is slightly larger than Greece with an area of about 147,000 square kilometers and primarily comprised of floodplains at the confluence of the Ganges, Brahmaputra, Meghna, hundreds of smaller rivers, and the Bay of Bengal. It shares borders with India to the north, west, and east and Burma to the southeast. Its low elevation and geographic location put the country at risk for floods and cyclones. These natural disasters cause recurrent crop and livestock losses that impoverish farmers and often lead to indebtedness, land sales, unemployment, and migration to urban areas. These same factors also contribute to the rich soil and a lush environment that make the region ideal for agri- and aquaculture.



### *History and Politics*

The Mughals and British ruled the region until it became the eastern part of Pakistan after Partition in 1947. As part of a united Pakistani state, Bangladesh struggled to gain social equality, political representation, and commercial and infrastructural development. Eventually, these circumstances prompted Bangladesh to fight for independence in 1971. With as many as 3 million people dead, nearly 10 million refugees in India, and ongoing political unrest, independent Bangladesh has struggled to build a stable democracy. In 1974, a food shortage that followed major flooding resulted in famine that left 1.5 million people dead. This further destabilized the young democracy. In 1975, low-ranking members of the military assassinated the Prime Minister, Mujibur Rahman. Following the assassination, the military declared a state of emergency and began 15 years of military rule in the country. Since democracy was reinstated in 1991, two parties, the Bangladesh Nationalist Party (BNP) and the Awami League, have dominated the political scene. A bitter rivalry between these parties has resulted in a political stalemate that has frequently led to violence. Democratic Bangladesh has also gained an infamous notoriety as one of the most corrupt countries in the world and has seen a rise in Islamic fundamentalism. In 2006, the military declared another state of emergency to reinstate law and order, decrease corruption, and attract investment. The military handed power back to civilian rule in 2008, but the political arena is still marked by partisanship and lack of consensus. Meanwhile, climate change and rising ocean levels threaten to further stifle progress in a country that has faced major cyclones in 1970, 1991, 2007, and 2009 and floods in 1974, 1988, 1998, and 2004 (US Department of State 2010).

### *Economy*

Bangladesh's human, economic, and infrastructural challenges have given rise to a vibrant NGO sector. Several of these organizations began as field hospitals, agricultural extension programs, primary schools, and credit programs in the years after independence. In the absence of effective government services, these organizations have innovated and grown to provide health, education,

communication, and economic development services throughout the country. The Bangladesh Rural Advancement Committee (BRAC) is the world's largest NGO with non-profit and for profit programs in health, agriculture, education, manufacturing, and finance. The Grameen Bank, a pioneer in rural credit services for low-income people, won the 2006 Nobel Peace Prize for its work with nearly 8 million members. The combined efforts of this sector have improved the quality of life of millions of people and stimulated economic growth, making Bangladesh's NGO sector an example for other developing countries around the world.

Bangladesh's gross domestic product (GDP) has grown by about 5 percent a year since 1991 to about \$105 billion in 2010 (International Monetary Fund 2010). About 48 percent of the workforce (23 million) work in agriculture, forestry, and fishing and represent 18.6 percent of Bangladesh's 2009 GDP. The agri- and aquaculture sector has shrunk by about 5.5 percent since 2000. On the other hand, the manufacturing sector has grown in recent years, accounting for 18 percent of total GDP and 11 percent (5.2 million) of the labor force in 2009. Exports from Bangladesh's roughly 4,500 ready-made-garment and textiles factories have driven growth in this sector. The country's textile industry employs 3.5 million people and accounts for 80 percent of the country's total exports (Financial Express Bangladesh 2010b). Trades and retail represent the third largest share employing about 7.8 million people (16.5 percent of labor force) and contribute about 15 percent of total GDP (Bangladesh Bureau of Statistics 2010).

### *Demographic Trends*

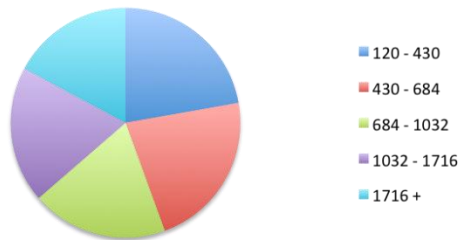
Limited rural income, underemployment, frequent natural disasters, and job opportunities in cities have resulted in large-scale urban migration. In 1950, the urban population was less than 5 percent; it was 25 percent in 2000 and expected to increase to 44 percent by 2030 (Population Division 2009). The Bangladeshi capital, Dhaka, is the world's fastest growing city and home to nearly 15 million people; it is expected to grow to over 20 million by 2025 (German and Solana 2010). Bangladesh's cities are growing at a rate of 3.2 percent per year with much of the growth-taking place in unplanned, low-income slums. This demographic shift has given rise to problems like pollution, health and sanitation issues, crime, and drug addiction.

**Exhibit 6.** Food Expenditure in Bangladesh (Bangladesh Bureau of Statistics 2009)

Monthly Income Range (Taka)	Monthly Income Range (Dollars)	Annualized Income in Dollars	% of Households	# of Households	Annualized Segment Expenditure (Dollars)	Share of Total Expenditure
<750 - 2499	<10 - 36	120 - 430	22%	5,722,690	2,931,680,509	11%
2500-4000	36 - 57	430 - 684	22%	5,669,159	3,721,112,947	14%
4000-5999	57 - 86	684 - 1032	19%	4,929,925	4,242,758,565	16%
6000-9999	86 - 143	1032 - 1716	19%	4,797,373	5,528,036,164	21%
10000 +	143+	1716 +	17%	4,376,774	9,641,657,345	37%
Total				25,495,920	\$26,065,245,530	

All dollar figures assume an exchange rate of 70 taka/dollar.

**Annual Household Income  
(in Dollars)**

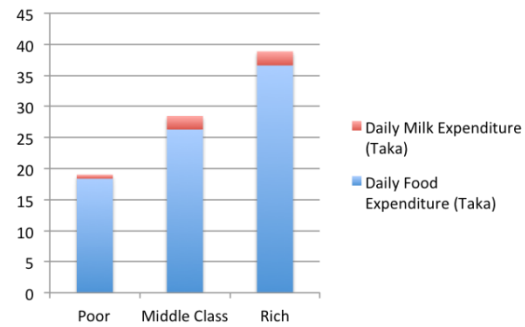
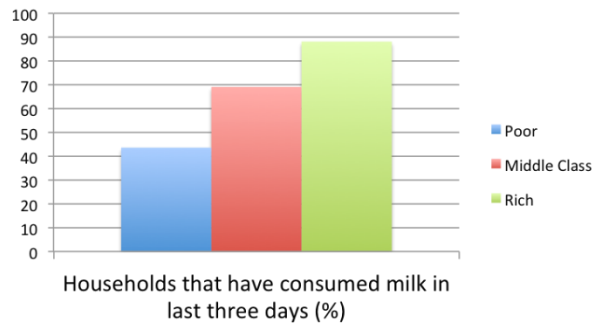


**Share of National Expenditure by  
Income Segment**



**Exhibit 7. Milk Consumption (Halder and Barua 2003)**

Indicator	Sample Groups					Economic Status		
	Low Vibrant Village	High Vibrant Village	Slum	Char (Riverbank)	BRAC Staff	Poor	Middle Class	Rich
Households that have consumed milk in last three days (%)	61.7	58.7	42.5	73.3	69.6	43.6	69.1	88.1
Daily Food Expenditure (Taka)	24.2	25.0	19.4	21.6	32.1	18.4	26.3	36.6
Daily Milk Expenditure (Taka)	1.2	1.2	0.6	1.61	1.5	0.6	2.2	2.3



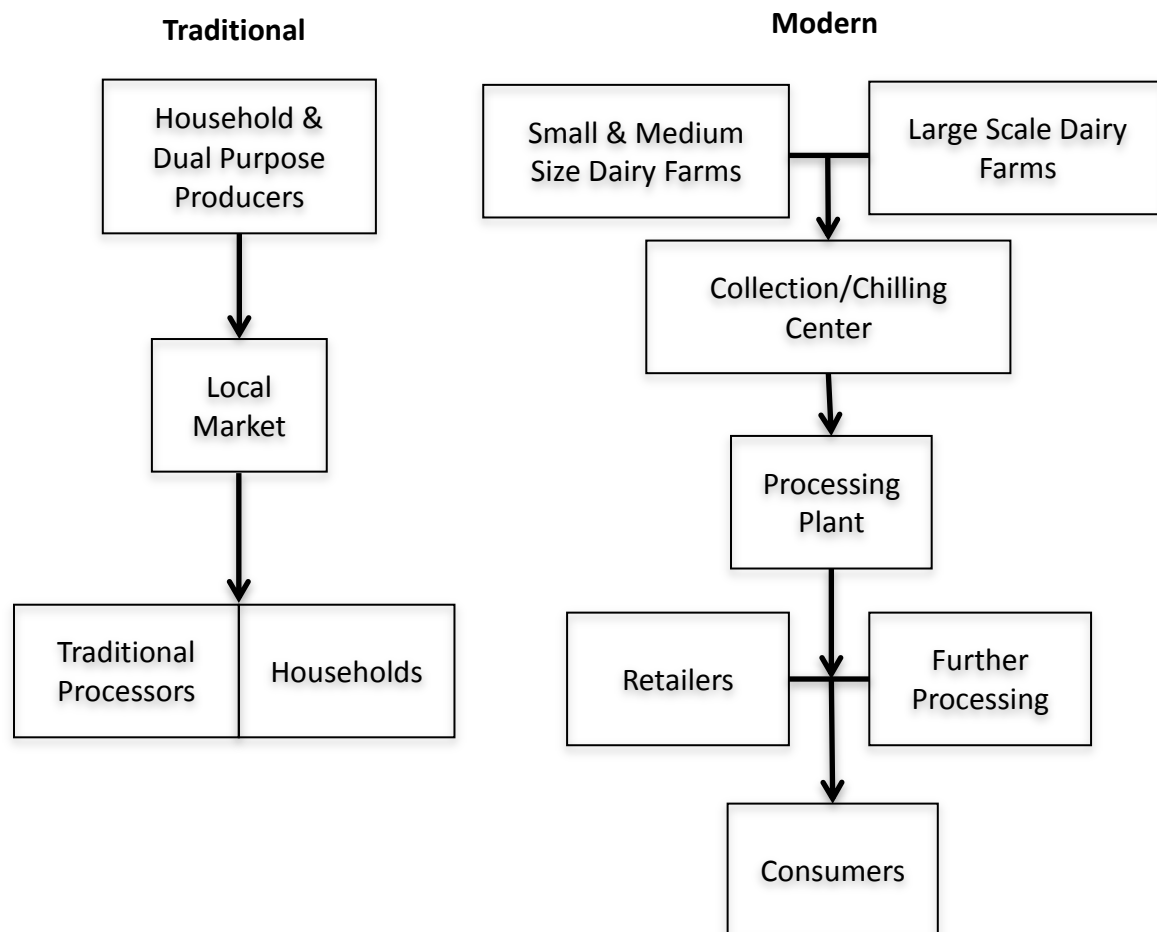
**Exhibit 8. Facts About Bangladesh's Dairy Industry (Halder and Barua)<sup>a</sup>**

- Bangladesh is home to over 24 million cattle, more than 50 percent of which are located in the Rajshahi and Dhaka divisions.
- Due to land and capital limitations, the average Bangladeshi cattle herd is only 3.5 versus about 120 in the US (McDonald et al. 2007).
- Livestock farming provides full-time employment to about 20 percent of the Bangladeshi labor force.
- Dairy farms in Bangladesh are divided into five categories:
  - Dairying for home consumption - 1-3 cows that provide enough milk for home use with a small surplus that is sold in the market.
  - Rearing for dual purpose (draft and milk) - rear 2-6 male and female cows that work in the fields during planting and harvesting and produce milk during the off season.
  - Small and medium dairy farming - Roughly 62 percent of all female cattle in Bangladesh can be found on small/medium farms with 2-25 cows.
  - Large private dairy farms – Farms with herds of more than 26 cows accounts for the smallest portion of Bangladeshi dairy farmers.
- The highest concentration of cattle rearing takes place in char areas where there is open space for grazing. Cattle are used as draft power for agriculture and as sources of meat and milk.
- While about half of all cattle are female, less than twenty percent actually provide milk.
- Indigenous and hybrid cows are the predominant cattle breeds in the country because an Australian milk cow costs \$4000-6000 and an indigenous cow can cost less than \$200.
- A cow's peak lactation period is 180-240 days after it gives birth, and yield varies greatly depending on breed. An indigenous cow produces 200-1000 liters during its lactation period while an Australian cow can produce about 7,000 liters per lactation period, which is about 30 liters a day.
- Yield also depends on the quality of feed that is used. Roughly 90 percent of cattle feed comes from agricultural bi-products such as rice straw; this limits milk yield but costs little or nothing to produce.
- A typical hybrid cow needs about 9 kilograms of enriched feed to produce 15-20 liters of milk a day. Enriched feed with lentils, corn, coconut, local supplements such as Atol and Teel, calcium, and salt can increase yields by up to 33 percent (Director of Livestock Research Center).
- While enriched feed could greatly increase milk yield, the added price is unaffordable for most dairy farmers unless it is subsidized.

<sup>a</sup>Unless otherwise noted, all information in this exhibit is from Halder and Barua (2003).



**Exhibit 9. Value Chain Comparison**

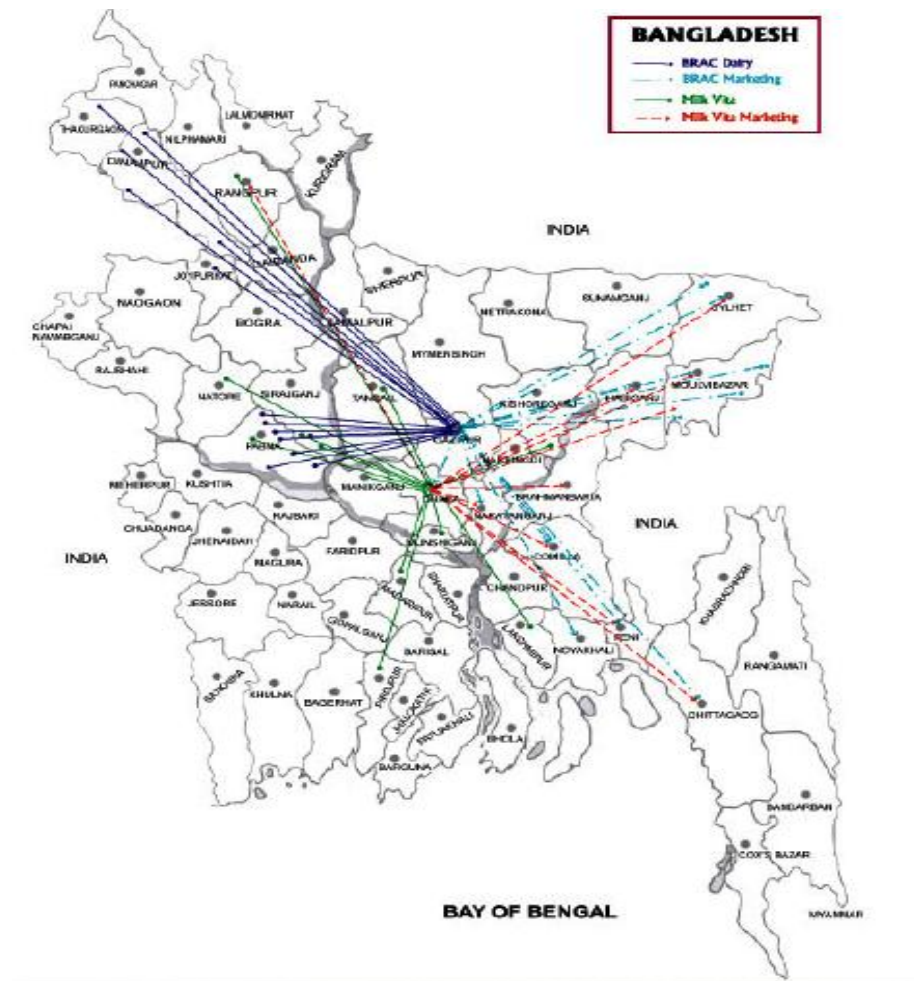


**Exhibit 10. Bangladesh Milk Market**

<b>Enterprise</b>	<b>Number of Chilling/ Collection Centers</b>	<b>Operating Districts</b>	<b>Annual Production (liters)</b>	<b>Market Share</b>
Milk Vita (Parves 2010)	26	15	650 million	30.00%
Aarong (Social Enterprises 2010)	92	25	314 million	14.00%
Pran (Yunus 2010b)	28	n/a	14.6 million	0.07%
Grameen Danone Foods	4	3	1.76 million	0.08%
Savar Dairy (Foreman, Savar Dairy 2010)	1	1	219 thousand	0.01%
All other Production <sup>a</sup> (BBS 2010)	n/a	n/a	1.2 billion	55.00%
<b>Total Production</b>			<b>2.2 billion</b>	

<sup>a</sup> Includes modern processors and traditional milk producers.

**Exhibit 11.** Milk Vita and Brac Supply and Distribution (Halder and Barua 2003)



## **Exhibit 12. Key Facts on Competition**

### *Milk Vita*

- Founded in 1973 by Prime Minister Mujibur Rahman with support from foreign government aid programs including the Danish agency, DANIDA.
- Bangladeshi government owns about 70 percent of the company's equity and has given it a large loan facility; cooperative members own the remaining shares.
- In 2008, MilkVita collected milk from over 180,000 small dairy farmers that are members of over 1000 village cooperatives in 15 districts of the Rangpur, Rajshahi, Khulna, and Barisal Divisions. In 2008, the cooperative produced about 650 million liters of milk (Daily Star Bangladesh 2009).
- Cooperative members have access to veterinary, breeding, and training.
- MilkVita has 26 cooling and storage facilities in its production areas with processing plants in Sirajganj, Rajshahi Division and in the Mirpur part of Dhaka.
- The Mirpur Plant (Security Manager, MilkVita Mirpur Plant 2010).
  - Primary conduit for distributing to the city of Dhaka.
  - Supplied with milk by about 24 large (10,000 liter) and 8 small (5000 liter) tankers that bring processed milk to Mirpur from the Sirajganj plant.
  - It produces about 200,000 liters of packaged milk per day
  - Liquid milk is also further processed to make ice cream, sweet yogurt, and other milk-based sweets.
  - MilkVita distributes to 32 places around Dhaka using 24 refrigerated trucks that have 10,000, 3,000, or 1,000-liter capacities. Trucks are met by up to 20 bicycle rickshaw vans that deliver the products to retail stores.

### *BRAC Aarong*

- Began in 1998 using a holistic model for livestock rearing which focuses on providing training, credit, and extension services to dairy farmers.
- Extension services include subsidized feed, basic veterinary services, vaccinations, and cattle insemination facilities. In 2008, BRAC conducted over 550,000 artificial inseminations and distributed more than 31,000 metric tons of feed to cooperative members.
- Individual producers are organized into cooperatives that provide 40-1800 liters of milk a day. Using this system, in 2008, BRAC collected more than 300 million liters of milk and maintained 92 chilling and storage centers in 25 districts around the country (Social Enterprises 2010).
- The majority of BRAC's milk comes from the areas around Pabna, which is on the banks of the Padma (Ganges) River, and Shahajadpur, which is near the Jamuna (Brahmaputra) River (Halder and Barua 2003).
- The primary processing and packaging facility is about 40 kilometers north of the Dhaka in Gazipur; it produces and packages eight products including fresh milk, lowfat milk, chocolate milk, butter, ghee, yogurt, mango milk drink, and powdered milk packets.

- Finished products are distributed to retail stores by agents who meet refrigerated trucks at fixed points. Each agent employs van drivers who distribute the products to retail stores on commission.

*Other Notable Competitors* (Foreman, Savar Dairy 2010)

- There are 5 government-owned dairy farms in Savar, Bogra, Sylhet, Faridpur, and Barisal that were partially funded by foreign aid.
- The Savar farm is the flagship dairy farm and is also the largest single-site cow farm in Bangladesh with roughly 400 employees and 1500 cows. The campus includes an artificial insemination program and feed production plant as well as milk processing and packaging facilities.
- Mismanagement and corruption have caused the Savar farm to decrease from a peak of 5,000 cows. During a December 2010 site visit, only 20 cows were producing milk.
- The Bangladesh Livestock Research Center is adjacent to the Savar farm and focuses on new product development, breed research, and contributes to the national livestock strategy.
- In 2002, the Savar Dairy controlled about 1 percent of the total market for processed milk, but by 2010, it was producing less than 800 liters of milk a day and primarily selling to employees.

### **Exhibit 13. GDF Milk Supply Chain**

*Company-Owned Milk Collection Center (Jeanveaux 2010).*

- The original collection center in Sariakandi is located on the banks of the Jamuna River, and supplied by 65 farmers that live within a 2-kilometer radius.
- Farmers have 1 to 30 cows, bring 400 grams to 60 liters of milk per day, and are paid a fixed price of 26 taka per liter. With increasing market prices for milk, there is pressure to increase the fixed price to be more competitive.
- The center operates from 7 to 10:30 am and 3:30 to 5:00 pm daily, and 75 percent of milk is collected in the morning. Staff are paid a volume-based commission, which allows them to earn about \$70 a month.
- The Sariakandi Center collects 600 liters of milk a day and has a daily capacity of 800 liters. Rickshaw drivers – 2 in the morning and 1 at night – transport milk to the chilling center and earn 100 taka for the 1-hour trip.
- Milk is stored in 14-liter containers and held for 1.5 to 2 hours before it is brought to the chilling center in Ramchandrapur, a large village connected to the electrical grid.
- The Ramchandrapur chilling center is located about 20 kilometers east of Bogra, it chills and stores an average 1,200 liters of milk a day and make deliveries to the factory in the evening.
- Another chilling center with the same capacity was recently established in Rangpur about 30 kilometers north of the factory, it contributes 800-900 liters of milk a day.

*Grameen Livestock Foundation (Managing Director, Grameen Livestock and Fisheries 2010)*

- GDF also sources 600-700 liters of milk a week from the Grameen Livestock Foundation that is based in Tarash, about 50 kilometers south of Bogra.
- Similar model as BRAC where cooperative members are provided with training, credit, cattle insemination, health, insurance, and related services.
- Since 2000, 7,500 milk cow loans and insurance packages have been distributed with an average loan package of 12,000 taka (\$170) and a two-year payback period.
- The foundation maintains about 16 unrefrigerated collection centers, each with capacity of 300-500 liters, and 3 chilling centers with individual capacity of 1000-3000 liters. These 3 centers were opened in 2002 with an initial capital investment of around \$60,000.
- The foundation also manages a couple small feed factories that have struggled to build demand as input costs increase and the cooperative members' ability to pay decreases.
- With increased focus on a vertically integrated supply chain, GDF collections from GLF have decreased in recent years. As a result, borrowers are now beginning to default on their livestock loan, which leaves the future of GLF in question.

*Nandigram Farm*

- GDF also collects milk from a large cooperative farm in Nandigram, a town about 40 kilometers southeast of Bogra.
- The farm is operated by an NGO that own 70 cows and works with about 370 local farmers.

- The farm collects, chills, and delivers the milk to the Bogra factory, which saves GDF the cost and effort.
- Collections from this source have increased recently and GDF seems poised to increase collections from Nandigram as the Bogra factory increases production.

*Spot Market*

- If supply from other milk vendors does not meet daily production requirements, GDF must purchase milk on the spot market.
- The prices on the spot market are about 10 percent higher than fixed rates and vary greatly based on the season.
- In 2010, purchases in the spot market have accounted for up to 38 percent of GDF's daily raw milk supply.

## **Exhibit 14. Other Supply Chain Items**

### *Date Molasses*

- Kajur gur (date molasses) is processed sap of palm trees and is prevalent in western and southwestern Bangladesh.
- In rural areas, pure date molasses sells for about 60 taka (86 cents) a kilogram and prices rise to over 80 taka (\$1.15) in Dhaka.<sup>a</sup>
- The palm trees take about 8 years to reach maturity and can provide sap for up to 50 years. For commercial production, trees are planted in orchards with a density of about 75 trees per acre.
- Trees produce sap for about 5 months of the year, and the sap is harvested about 3 days a week. A healthy tree can produce more than 5 kilograms of sap per harvest, however yield is often less since trees are overharvested and unhealthy.
- Harvesting Process:
  - Tapping a hole in the top of the tree and placing a clay pot below to collect for a day.
  - Boiling collected sap down to about a third of its original weight and placed in half-kilogram molds where it cools into a solid form.

### *Nutrients*

- The original yogurt recipe includes about 30 percent of a child's recommended consumption of iron, calcium, vitamin A, and iodine. Recently, GDF also introduced a yogurt product with extra protein.
- Nutrients sourced in powder form from Europe and added during the mixing stage of the production process.

### *Packaging*

- GDF's yogurt cups are packaged in dairy quality plastic that is imported from Saudi Arabia.
- The plastic is delivered in sheets, heated, and then molded into 60 and 80 gram cups.
- Shipping process is costly and can take months to complete, this makes it difficult for GDF to quickly react to demand increases.
- Squeezable sachets have significantly decreased packaging costs and could provide a cheaper alternative to cups in some market segments.

<sup>a</sup>Based on field visit to Date Molasses farm in the town of Amani Bazaar in the Rajshahi Zila.



**Exhibit 15.** GDF Raw Milk Supply Chain Map

