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NESTLÉ INDIA'S DAIRY DEVELOPMENT INITIATIVE IN THE PUNJAB REGION

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SUMMARY

In a context of market liberalization and increased competition for milk supplies, the case of Nestlé India in the Punjab Region of India shows how the company has invested heavily in the overall improvement of the state's dairy industry. By providing easy access to inputs, technical advice, credit and a year-round outlet to its smallholder suppliers, Nestlé India has managed to develop a secured supply source for its processing activities while also contributing to a modernization of the state's dairy sector. This has translated itself in the mechanization and specialization of dairy farms, and an increase in herd genetic potential, yields, and quality of the milk procured. This case is an example of how a private company can promote the development of an industry dominated by smallholder farmers in order to ensure its own source of raw material. It is particularly interesting for public authorities who wish to give a greater role to private stakeholders in the development of their agro-industries.

1. INTRODUCTION

With milk production exceeding 100 million tonnes during 2006–2007, India is currently the largest milk producing country in the world. Like in most developing countries, a large share of the marketable surplus of milk (70–85 percent in different regions) is marketed through the unorganized sector comprising milk vendors, traders and small private dairies. Dairy cooperatives are the largest players in the organized sector. The Operation Flood initiative to develop the dairy sector in India focussed on cooperative development, which gave this sector an edge over the private sector. Along with this, dairy sector regulations such as the Milk Market and Products Order (MMPO) imposed further restrictions on large-scale private-sector investment in the dairy sector. Thus, historically there have been few large-scale private players involved in the dairy sector in India. Nestlé India Limited has been one of the dominant private players in India involved in milk collection and processing dairy products for over four decades.

The situation in the dairy sector is now changing dramatically. Like the agricultural sector, the dairy sector has also been liberalized in recent years. These changes have given an impetus to private-sector investment in the dairy sector. Some examples include Hatsun in Tamil Nadu, Heritage in Andhra Pradesh and Dynamix in Maharashtra. More recently big players such as Reliance, Bharti, Coca-Cola and PepsiCo, have voiced plans to invest heavily in the dairy sector. Reliance has entered the liquid milk market with its brand Dairy Pure in Hyderabad and is looking at further acquisition models (Hindu Business Line, 2007). Coca-Cola and PepsiCo also have plans to invest in the dairy sector, especially with the increasing consumer shift away from carbonated soft drinks to healthier beverages. Furthermore, in the emerging liberalized environment, food safety regulations are becoming increasingly important in the international as well as domestic markets. These changes make market access more difficult for the informal sector and encourage a higher involvement of the private sector in organized milk marketing. Finally, with increasing investment in supermarkets, companies involved in setting up retail outlets are also investing in dairy activities for milk procurement and selling under the company brand.

In the light of the emerging situation of increased private sector involvement in dairy, it is pertinent to undertake a detailed analysis of Nestlé India Limited, one of the first private players in the organized dairy sector. Nestlé India has been involved in milk procurement in Punjab since 1961 and currently procures up to 1.2 million litres of milk per day from about 100 000 farmers in this region. Nestlé India has been very closely involved in working with farmers to enhance yield, quality of animals, providing services and training farmers regarding good dairying practices. The objective of the study is to understand the operations of Nestlé in this region, the involvement of the company with the farmers in enhancing production and productivity, and ensuring quality of milk and milk products through the supply chain.

The next section gives an overview of the dairy sector in India, along with the policy regulations governing this sector. Before conducting a detailed supply chain analysis, a background of Nestlé is presented in Section 3. Section 4 describes in detail the supply chain of milk. Section 5 gives an overview of the impact of Nestlé India on dairy farmers involved with the company. Section 6 concludes with insights on lessons learned for the way forward.

2. THE DAIRY SECTOR IN INDIA

2.1 Milk production in India

From chronic milk shortages, India has become the largest milk producer in the world. Milk production increased from 21.2 million tonnes in 1968–1969 to 100 million tonnes in 2006–2007. The growth rate of milk production over the decade of 1995–1996 to 2005–2006 was 3.9 percent, which is higher than the population growth rate of 2 percent. Consequently the per capita availability of milk has also increased to 245 grams per day.

India stands first with respect to the bovine population having one-fifth of the world bovine population. In spite of India's position as the biggest producer of milk, productivity per animal is very poor at 987 kg/lactation compared with the world average of 2 038 kg/lactation. Three key reasons for low productivity include poor nutrition, low genetic potential for milk production and lack of adequate veterinary care.

Table 1 presents data on milk production in different states of India. Punjab, the smallest state in India, is the second largest milk producing state. Fifteen major states account for more than 90 percent of the milk production in the country. Milk yields per animal in Punjab are among the highest in the country for cows (7.4 kg/day) as well as buffaloes (5.7 kg/day) and almost three times the national average (Planning Commission Report, 2007).

Table 1: Milk production in Indian States

State	1997–98	2001–02	2002–03	2003–04	2005–06	2006–07
Punjab	7 165	7 932	8 173	8 391	8 909	9 168
Kerala	2 343	2 718	2 419	2 111	2 063	2 119
Haryana	4 373	4 978	5 124	5 221	5 299	5 367
Tamil Nadu	4 061	4 988	4 622	4 752	5 474	5 560
Gujarat	4 913	5 862	6 089	6 421	6 960	7 533
Uttar Pradesh	12 934	14 648	15 288	15 943	17 356	18 095
Andhra Pradesh	4 473	5 814	6 584	6 959	7 624	7 939
Rajasthan	6 487	7 758	7 789	8 054	8 713	9 375
Maharashtra	5 193	6 094	6 238	6 379	6 769	6 978
Karnataka	3 970	4 797	4 539	3 857	4 022	4 124
West Bengal	3 415	3 515	3 600	3 686	3 891	3 982
Madhya Pradesh	5 377	5 283	5 343	5 388	6 283	6 375
Bihar	3 420	2 664	2 869	3 180	5 060	5 450
Jharkhand	-	940	952	954	1 335	1 401
Orissa	672	929	941	997	1 342	1 431
All India	72 128	84 406	86 159	88 082	97 066	100 869

Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India

2.2 Role of cooperatives in dairy development

Operation Flood was a rural development programme started by India's National Dairy Development Board (NDDB) in 1970. One of the largest of its kind, the programme objective was to create a nationwide milk grid, helping reach milk to consumers in 700 towns and cities. The bedrock of Operation Flood has been village milk producers' cooperatives, which procure milk and provide inputs and services, making modern management and technology available to members. Currently, cooperative membership comprises about 13 million farmer members of which 3.4 million are women. These farmers comprise 122 534 village level societies, spread over 346 districts, federated at the union level by 170 milk unions, which are federated at the state level; state federations are in turn linked to the Mother Dairy at the national level.

Cooperatives are involved in all aspects of dairying: breed development; providing health care by training the cooperative society president at the village level; ensuring availability of subsidized fodder; collection of milk, processing and marketing of milk and other dairy products. The activities for dairy development funded by the government are undertaken by the cooperatives. Cooperatives have played a critical role in strengthening the milk sector in India through Operation Flood. Each state has a milk cooperative formed on the lines of the "Anand" pattern. The cooperatives in different states sell under separate brands like Amul (Gujarat), Vijaya (Andhra Pradesh), Verka (Punjab), Saras (Rajasthan), Nandini (Karnataka), Milma (Kerala) and Gokul (Kolhapur), which are among those that have earned customer confidence. The performance of the state cooperatives varies significantly across states. The most successful cooperative is the Gujarat cooperative AMUL in terms of being a good representative of farmers' interests, as well as in product development and overall profitability (Chandra and Tirupati, 2003).

2.3 Dairy sector regulations

The dairy sector regulations in India have been contentious. Until 1991 the sector was licensed under the Industries Development and Regulation Act (IRDA) of 1951. This resulted in preferential treatment given to milk cooperatives that were outside the purview of the act. In 1991 the dairy sector was technically delicensed. The act was replaced in 1992 by the Milk and Milk Product Order (MMPO). The main objective of the order was to maintain and increase the supply of liquid milk of desired quality in the interests of the general public and also for regulating the production, processing and distribution of milk and milk products. As per the provisions of this order, any person or dairy plant handling more than 10 000 litres per day of milk or 500 million tonnes of milk solids per annum needs to be registered with the authority appointed by the Central Government. Every holder of a registration certificate could collect or procure milk only from the "milkshed" assigned under the registration certificate. The milkshed, in turn, was defined as "an area geographically demarcated by the registering authority for the collection of milk or milk product by the holder of a registration certificate".

The Government of India has amended the Milk and Milk Product Order 1992 from time to time in order to make it more liberal and better oriented to facilitate dairy entrepreneurs. One of the biggest changes was that the concept of milkshed was abandoned.

Traditionally, cooperatives did not have much competition from the private sector.

The amendments to the MMPO were made to liberalize the dairy sector and encourage private sector investment in this area. All players, private companies like Nestlé or the Amul

cooperative, can now invest into the development of the dairy sector by providing services, extension and inputs. The amended MMPO also allows any new entrant or established player to purchase milk from any area regardless of the former restricted milkshed areas.

3. NESTLÉ OPERATIONS IN INDIA

3.1 Background of the company

The information presented in this section draws from the information about Nestlé India Limited available on the company website (www.nestle.in). Nestlé was founded in 1867 in Vevey, Switzerland by Henri Nestlé. In 1905, Nestlé acquired the Anglo-Swiss Condensed Milk Company. Nestlé's operations in India started in 1912, when it began trading as The Nestlé Anglo-Swiss Condensed Milk Company (Export) Limited, importing and selling finished products in the Indian market. After India's independence in 1947 the economic policies of the Indian Government emphasized the need for local production. Nestlé set up its first factory in 1961 at Moga, Punjab, where the Government wanted Nestlé to develop the milk economy. Moga then was not a very well developed area, located at the beginning of the desert area, with no irrigation or tube well, using bullocks largely for drawing water. Progress in Moga required the company to invest in extension services to educate and advise farmers in various aspects of dairying – from increasing the milk yield of their herd through improved dairy farming methods, to irrigation, scientific crop management practices and helping with the procurement of bank loans. Milk collection centres at various points in the region were set up to ensure prompt collection and payment, and instill confidence in the dairy business.

Nestlé India manufactures products in various categories ranging from milk and nutrition products, beverages, prepared dishes and cooking aids, chocolate and confectionery. Some of its internationally famous brand names include Nescafé, Maggi, Milkybar, Milo, Kit Kat, Bar-One, Milkmaid and Nestea. In recent years the company has introduced products of daily consumption such as Nestlé Milk, Nestlé Slim Milk, Nestlé Fresh 'n' Natural *Dahi* and Nestlé *Jeera Raita*. Nestlé products are sold throughout India and are also exported to Russia, Hungary, Japan, the United States of America and several other countries. These include certain international brands like Nescafé and Lactogen, as well as select culinary products to meet the demand of the ethnic Indian population living abroad. For three years in succession, Nestlé India was awarded the top Exporter Award for its instant coffee, and for export of all types of coffees to Russia and countries in the Commonwealth of Independent States

3.2 Social and environmental activities at Nestlé India Limited

Corporate social responsibility

Nestlé India works with the communities where it operates to create shared value. The company has established 102 clean drinking water facilities for students in government schools in villages around its factories. The project has been operational since 1999 and students are educated on water conservation through posters, demonstrations and drawing competitions. More than 30 000 school students are benefiting from these facilities. The company has facilitated various initiatives which include blood bank services, ambulance services, immunization and health awareness centres in coordination with local government and non-government agencies like the Indian Red Cross Society. Nestlé India also recognizes the active role that village women play in adopting good dairying practices in dairy farms and regularly conducts special programmes that help them. Over 30 000 village women have been covered under the Village women dairy development project.

Environment

Nestlé Environment Management System (NEMS) is developed by Nestlé worldwide as a business excellence tool which looks after all environment-related issues. Some of the activities of the NEMS team at Moga include:

- Reducing energy consumption and water consumption;
- Reducing solid waste generation;
- Using treated effluent to create green belts both inside the factory and outside the factory premises, e.g. government parks, agricultural lands.

Because of all these initiatives, the Moga Factory has been recognized with the Environment Excellence Award by the Government of Punjab

4. NESTLÉ MILK QUALITY SUPPLY CHAIN

4.1 Size of dairy operations

Nestlé started milk collection in the Moga area from farmers on 15 November 1961. On the first day 511 kilograms of fresh milk were collected from four villages. From that day onward the company has been collecting milk continuously both morning and evening without any break for more than four decades. The total milk procurement in 1962 was 20 million kilograms from 4 660 farmers of 66 villages and today the Moga factory has established 2 121 milk agencies spread out in 1 900 villages spanning an area of 15 000 square kilometres spread out over ten districts of Punjab. Starting with only three milk routes in 1962, today there are 29.

Figure 1: Scale of operations at Nestlé India Ltd (1961 – 2010)



Source: Nestlé India Ltd

Current milk collection ranges from 0.5 to 1.2 million litres per day in peak season covering 100 000 farming households in Punjab. This is comparable to the average milk collection by the Punjab dairy cooperative which is around 0.79 million litres per day. Reaching the same scale of operations as the cooperative in the state is a significant achievement for a private company. Though the scale of operations for both organizations is the same, membership in the cooperative is about 3.5 times the number of farmers selling to Nestlé India. Nevertheless, in terms of overall marketable surplus in the state, the total collection by the cooperative and Nestlé is around 15 percent of traded milk. Most of the milk in Punjab is still marketed through informal private traders.

4.2 Quality requirements and supply chain management

Quality is emphasized at all the levels in the chain: input (extension, feed, and veterinary inputs), farm production, milk collection and transportation, and finally processing.

Inputs

The company has developed a comprehensive extension system using various approaches to impart information about livestock rearing and good dairy practices. These approaches include conducting field camps and workshops, organizing exposure visits to demonstration farms as well as organizing factory visits and educational tours to educate farmers. Literature on dairy is regularly published and distributed: a monthly magazine is published to inform farmers; informative posters are placed at the collection centres. The payment envelope that goes to the farmers every two weeks with payment intimation has a message regarding livestock keeping. Finally, specific workshops for women have been organized to ensure that the messages reach the women who are the most important caretakers of the animals. Through posters, demonstrations and talks, village women are taught good dairying practices. Over 30 000 women have been covered by this programme in 550 villages. For maintenance of sustainable farming practices, the company provides technical support for silage making techniques, biogas generation and vermicompost from animal waste.

The company has links with feed companies and procures feed in bulk. There are many private companies involved in feed manufacturing. A critical element in feed is lack of regulations on quality issues. It is not easy for the farmers to be sure of the quality of the feed they have purchased. Nestlé's involvement in feed procurement ensures quality of feed. Further, the company does bulk purchase, which reduces feed cost for farmers. Good quality fodder seed is also made available to the farmers at cost basis.

In most areas in India, access to good veterinary care is a major problem in livestock development. In the areas of Nestlé operation, the farmers have access to good quality health and breeding services. Nestlé India has a network of veterinary and field staff which is available to the farmers round the clock. The farmers do not pay for veterinary services, but are required to pay for the medicines purchased. The company has made provision for artificial insemination centres and high pedigree breeding bulls are also provided. Till date 188 artificial insemination centres have been developed.

Medicines and vaccines needed for the animals are available at cost price at the local milk collection centre. The medicines provided by the company cost less than purchasing from the open market because of bulk purchase. Furthermore, the quality and availability of these medicines is assured. In the case of vaccines available in the open market, a proper cold chain is often not maintained, rendering them ineffective. At Nestlé India, infrastructure is available to ensure the quality of vaccines.

Banks offer competitive rates of interest for groups of farmers who are involved in long-term business enterprises like dairy farming with assured marketing arrangements. Animal insurance becomes mandatory along with the dairy loan from the bank, so it covers the significant risk of high-value dairy animals. Where possible, Nestlé provides support to farmers in linking them to banks for easier access to credit.

Production on-farm

There are regular audits of farmers to ensure that good farm practices are implemented and maintained. Three key aspects of information are collected – breeding, health and milk production, based on which farmers are informed about feed, artificial insemination and calving indicators. This helps to monitor animal progeny and breed development.

The company has recently invested in developing technology for better farm management. This involves tagging animals and developing a database for different animals. Usually records are maintained at the farm level, but not for individual animals. Another aspect of mechanization as mentioned earlier is provision of subsidized milk machines to farmers who own more than 15 animals. This helps significantly reduce the farmer's time and labour needs.

Milk collection and transportation

Milk collection points with chilling centres have been established to arrange for milk collection. Each of these centres is managed by a local person. Farmers bring milk to the closest collection centre. Large farmers have been provided with milk cans. In some cases, where milk production per farmer is significantly high, chilling tanks have been provided at the farmgate. The company sources its milk through a network of around 2 000 commission agents who collect the milk from farmers spread across 15 000 km² of the Moga milkshed. To improve the quality of milk since 1995, Nestlé is implementing a programme for installing farm cooling tanks with a capacity of 1 000–2 500 litres at the primary agency level. So far, about 700 such tanks have been set up. To manage quality at the collection centre, all these collection centres are equipped with fat, solid non fat (SNF), and adulterants testing. Poor-quality milk is not accepted from farmers. In case of serious quality issues farmers are blacklisted and milk is not procured from them.

Initially it used to take 2.5–3 hours for the milk collected from the agents to reach the four chilling centres. As a result, by the time the milk would reach the plant, the bacterial load would range between 10 million and 40 million per ml. But currently 90 percent of the milk Nestlé receives is chilled within half-an-hour of leaving the udders and much of it has a total plate count below one million.

Milk is transported from the village agencies in tankers to maintain quality. Milk from different areas is collected in separate chambers in the tanker. Tankers are tested for antibiotics and bacterial load. In case of unhygienic milk, it can be traced back to the collection centre, where samples can be further tested to identify the farm from which the milk was received.

Processing

The major products processed from the raw milk are Everyday brand dairy whitener and baby foods. These products are made in the company's state-of-the-art facility maintaining quality standards required for HACCP certification.

Overall chain management

Farm level profitability is a function of three factors: input costs, management practices, and milk prices received by farmers. Support by Nestlé on each of these factors ensures the profitability of farmers working with the company. The input costs for the farmers working with the company are minimized because of bulk purchase of feed, medicines and vaccines. Furthermore, the company is also involved in working with banks to ensure availability of credit. Three reasons for losses at the farm level include low genetic potential of animals, bad rationing of feeding, and poor management practices. Proper management practices ensure lactation throughout the year. In the case of Nestlé India, farmers are given training on proper management practices through field day demonstrations and farm literature. These extension efforts help to ensure lactation throughout the year. The company advises farmers on breed development, rationing practices and proper management practices to minimize losses. Given the market situation, milk prices are announced by the company every week. The company pays competitive prices to the milk farmers. Although farmgate prices can be inflated by market

players who are experiencing temporary shortages, these are not players who buy consistently throughout the year. In contrast, Nestlé India has been procuring milk twice every day without a break since its inception. Thus, the company has consistently provided an assured market to the farmers.

Milk samples are collected regularly from every farmer to ensure payment in accordance with milk quality. Farmers are paid on the basis of fat and solid content. The collection centres have electronic weighing and testing mechanisms to ensure transparency and fairness in payments. Farmer records as well as manager records are updated every morning and evening. Farmer payment is made every fortnight. It might appear that milk testing and transparency in payment is a key requirement in milk marketing and is followed everywhere. However, ground reality in several parts of the country is that very often farmer milk is not tested regularly. The farmer payment is based on average fat content but can also vary according to the bargaining power of the farmer.

Nestlé India has a network of veterinarians, milk centre managers, and experts to provide technical assistance to farmers when required. An indirect way of ensuring milk quality is to provide information on management practices. Quality control is also maintained through the network of milk centre managers and veterinarians. If the veterinarian has prescribed medicines or antibiotics for an animal, the centre manager usually knows about it. Frequently, medicine is provided by the centre managers themselves so they can inform the farmer not to bring in milk from the specific animal. Furthermore, veterinarians are updated time to time regarding latest veterinary developments and informed about banned drugs. Ensuring bulk cooling and chilling facilities close to the farmgate ensures that the quality of milk is maintained. Bulk cooling facilities have been set up at the village level to enable chilling of milk as soon as it is delivered. Finally, quality of product is ensured at the processing level to meet the quality standards required.

5. IMPACT OF NESTLÉ OPERATIONS

Nestlé has been present in the Punjab for over four decades. An analysis of the change in farmers working with Nestlé with reference to some key parameters overtime can provide some insights regarding the impact of Nestlé operations on dairy farming in Punjab. Punjab is one of the most progressive states in India with some of the most enterprising farmers in the country. The dairy sector is well developed in Punjab, but Nestlé India's contribution to supporting this industry comes from its impetus to modernization and commercialization of the dairy sector in the state. Three key aspects of Nestlé operations in India have been highlighted: scale of operations at the farm level, support to cow milk over buffalo milk and emphasis on mechanization. The only other organized sector player in Punjab is the state cooperative Milkfed. Whenever available, comparable data from the Milkfed is presented to understand the operations of Nestlé India *vis-à-vis* the state cooperative.

5.1 Scale of operations at farm level

Dairy farming in India is usually undertaken as a part of the farming system along with agriculture. Purely commercial dairy farms are not yet very common. However, the importance of dairy in the farming system is highlighted by the changing profile of the farmers who supply milk to Nestlé India's plant in Moga, Punjab (see table 2).

Table 2: Share of different categories of suppliers and quantity of milk supplied to Nestlé India in Punjab

Shares in percentages				
Supplier category	Number of suppliers (1980–81)	Milk supplied (1980–81)	Number of suppliers (2006)	Milk supplied (2006)
Farm labourers (below 2kg/day)	27.31	6.53	16.8	2
Very small farmers (2-5 kg/day)	40.50	27.74	28.8	10
Small farmers (5-10 kg/day)	22.55	31.85	26.1	19
Average farmers (10 -25 kg/day)	8.45	24.45	21.7	34
Large farmers (25-50 kg/day)	0.95	6.38	4.9	17
Very large farmers (>50 kg/day)	0.20	3.05	1.7	18

Source: Nestlé India Ltd

In 1980–1981, 90 percent of the farmers were landless labourers or small and marginal farmers supplying about 66 percent of the milk procured. The average and large farmers comprised about 10 percent of the total farmers, and supplied the remaining 34 percent of milk procured. In 2006, this situation had changed significantly. Around 72 percent of the farmers belonged to the category of landless labourers and small and marginal farmers, contributing only 30 percent of the milk procured, whereas average and large farmers accounted for 70 percent of the milk procured by the company. This change in pattern of suppliers comes from the fact that farmers who have been involved with Nestlé for several years have been trained in managing cross-bred cows which have a much higher productivity than indigenous breeds. Consequently, more and more farmers have taken up dairy enterprises as a commercial activity rather than as a subsidiary farming activity.

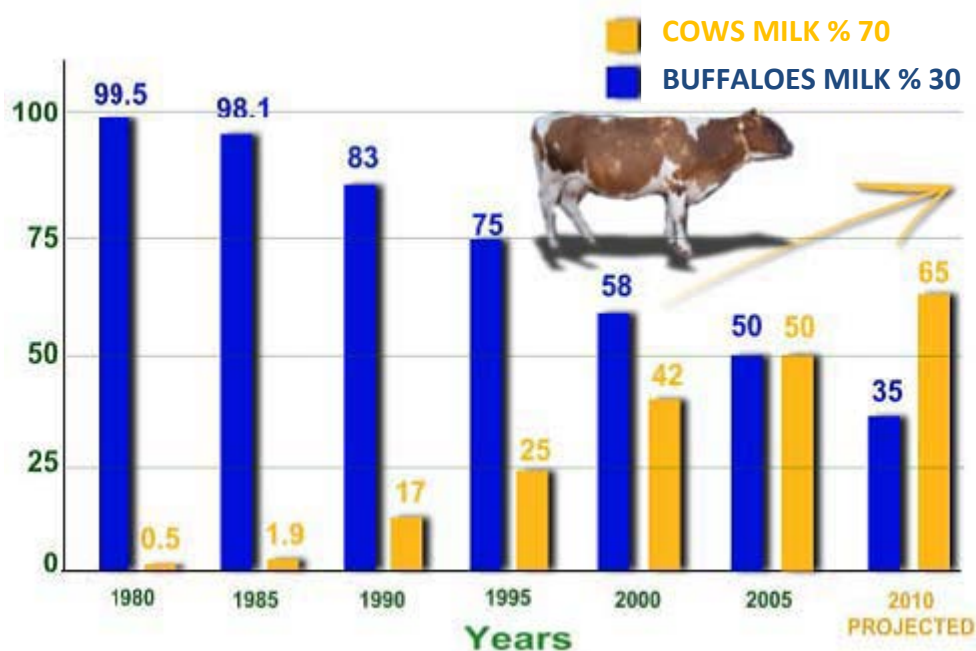
The total number of suppliers to the Moga plant has gone up from 7 934 in 1970 to around 100 000 in 2006–2007. The average quantity of milk supplied per farmer has also risen from 6.4 kg to

10.7 kg per day. As a comparison, the dairy farmers selling to the cooperatives are selling about 2.5 litres per day. As mentioned above, though the scale of operations of the two organizations is the same, the membership size of the cooperative is about 3.5 times the number of farmers selling to Nestlé India. This difference obviously stems from the goal of the cooperative to reach out to a large mass of farmers. In the case of Nestlé India farmers, there is an expansion of herds and a gradation to large-scale, mechanized, commercial dairying, which is a significant move from smallholder dairying.¹

5.2 Move from buffaloes to cow breeding

In India, buffalo milk is at a premium because of high fat content of 7 percent as compared with cow milk which has a fat content of 3–4 percent. In India, buffalo population is about 45 percent of the total dairy bovine population as compared with 10 percent cross-bred cows while the remaining 45 percent is indigenous cattle. In comparison, 20 percent of the dairy bovine population in Punjab is cross-bred cows, whereas buffaloes are about 78 percent of the dairy bovine herd. An important observation as shown in Figure 2 below is the shift to cross-breed cows in the case of Nestlé farmers. Buffalo yields rarely exceed 1 800 kg per lactation. In contrast, the improved Holstein-zebu (local) cross-bred cows yield 3 500 kg over a 300-day lactation period.

Figure 2: Change in share of cow versus buffalo milk



Source: Nestlé India Ltd

Until 1985 98.1 percent of the milk collected by the Moga plant was from buffaloes. This ratio has now fallen to 56 per cent, following Nestlé's conscious move to encourage farmers to raise more cows. The yield from cross-bred cows is not only higher, but more uniform throughout the year unlike that of buffaloes, which give 40 percent less milk during the lean summer months.

¹ Because of the great variety of farming systems involving a dairy enterprise which constitute the farm supply base for Nestlé and the milk industry in Punjab, and due to confidentiality restrictions from Nestlé, details of a production cost analysis for farmers supplying milk cannot be published in this study.

Therefore, the company has encouraged cow herds because they give better returns to the farmers and a more stable supply for the company.

5.3 Mechanization of dairy farming

Another aspect of the modernization of the industry spearheaded by Nestlé India is the provision of milking machines at the farm level. The company is supplying milking machines to farmers who keep more than 15 animals and supply 150 kg per day. While the farmer would have ordinarily paid INR65 000–70 000² for these machines, because of bulk purchase, the company procures these at about INR50 000, further providing a 25 percent subsidy to farmers. The remaining 75 percent is recovered by adjusting against their milk price over three years (The Hindu Business Line, 2003).

² At the time of study US\$1 ≈ INR40

6. LESSONS LEARNED AND WAY FORWARD

The dairy sector in India has been traditionally dominated by cooperatives because of the policy environment which gave cooperatives an edge over the private-sector players in this industry. In this context, the study of Nestlé India Limited presents an interesting case as one of the first private-sector dairies in India, which has grown and flourished alongside the cooperatives.

Being an international company, Nestlé India introduced modern dairy techniques and technologies to Punjab farmers. The company's involvement with Punjab farmers in the past four decades has had a significant impact on dairy farming in Punjab by emphasizing commercialization and mechanization of dairy farms. Because of Nestlé India's efforts related to introduction and management of crossbreds, which have much higher milk productivity, many farmers have moved to large-scale, mechanized, commercial dairying. Although there are still very few large-scale dairy farmers, their number is steadily increasing because of the higher profitability of commercial dairy farming. The Punjab region is in general a progressive state, but strong technical input and the support system provided by the company, and exposure to latest developments in the dairy industry have gone a long way in modernizing the dairy sector in Punjab. In future, the use of computer technology and software to tag animals and monitor specific animals instead of farms will contribute to breed development.

Quality has been emphasized in many ways:

- Providing extension;
- Developing a network of experts, centre managers and veterinarians;
- Developing infrastructure to maintain quality of milk including chilling centres at the farmgate and refrigerated transport.

Farmers are advised on breed development and dairy management practices through extensive field day demonstrations and farm literature to ensure production throughout the year and to enhance productivity. To encourage mechanization and to increase quality, Nestlé India has also introduced the farmers to milking machines.

Finally, profitability is the critical aspect which ensures that farmers keep working with the company. The profitability of farmers is ensured by Nestlé India providing:

- Quality and availability of dairy inputs (feed, fodder seeds, veterinary services, medicine, vaccines, credit etc.) at a reasonable price;
- Encouraging good management practices by balanced rationing; and
- Breed development.

Higher productivity combined with competitive prices has ensured profitability of the dairy farmers working with the company. The farmers also have an assured market as the company has been procuring milk morning and evening continuously since the inception of its activities in 1961.

In future, because of the sector's liberalization, private-sector investment in this area is likely to increase significantly. These developments pose a significant challenge to the established players, especially as the concept of milkshed area has been abrogated and dairies can procure milk from any region. This can have a negative impact on the established players who have invested in developing the milkshed area over time. On the positive side, the growth rate of the

dairy industry is high, which means that Nestlé India can expand its area of operations beyond its traditional milkshed region. Finally, Nestlé India has had a head start and invested in creating a strong network at the ground level. These factors will place the company ahead of its newly emerging competitors.

REFERENCES

Chandra, P. & Tirupati, D. 2003 *Business strategies for managing complex supply chains in large emerging economies: the story of AMUL*. Working Paper. Vastrapur, Ahmedabad, Indian Institute of Ahmedabad.

Planning Commission. 2007. *Report of the working group on animal husbandry and dairying for the eleventh five-year plan (2007–2012)*. New Delhi, Planning Commission, Government of India.

The Hindu Business Line. 2003. *Nestlé renders new look to dairying in Punjab*.

8 November 2003 (available at

<http://www.thehindubusinessline.com/2003/11/08/stories/2003110800831100.htm>).

The Hindu Business Line. 2007. *Reliance Retail enters dairy sector with liquid milk*. 31 May 2007 (available at www.thehindubusinessline.com).