Sri Lanka: Opportunities for dairy sector growth

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Background

Sri Lanka is largely self-sufficient in most animal products – apart from dairy. However, the consumption of dairy products has increased dramatically since the 1970s when the Government adopted open economic policies. Currently, Sri Lanka is about 15–20 percent self-sufficient with its milk products, though that level has been achieved mostly with imported milk powder.

The dairy industry has potential to contribute considerably to Sri Lanka’s economic development. A traditional industry surviving thousands of years, milk production also plays an important role in alleviating nutritional poverty in all age groups. And it is a source of extensive employment opportunities.

The Government’s ambitious target for growth in dairy production is an increase towards 50 percent self-sufficiency in milk products by 2015. At the current growth rate of 1–2 percent, the sector will need to grow at about 15 percent annually for the next eight years, with no increase in total consumption. This is a challenging task, given the current state of the industry, which only supplies approximately 20 percent of the domestic requirements. This contrasts with two decades ago when, prior to the economy’s opening in 1977, domestic sources of milk provided nearly 80 percent of Sri Lanka’s consumption needs. Given the current levels of malnutrition, particularly among pre-school children and pregnant mothers, milk production is an important activity for improving the nutrition situation.

Sector review

The contribution of the agriculture sector, including plantation crops, livestock, forestry and fisheries to GDP was 16.8 percent in 2006, having dropped from 21.3 percent in 1998 (Central Bank of Sri Lanka, 2007). With almost 90 percent of the population considered rural (Central Bank of Sri Lanka, 2006), 2005 data show that agriculture provided employment to 30.7 percent of the population. Livestock accounts for only about 1.2 percent of GDP, but it is an integral part of many other agricultural enterprises providing draught power, transport and dung for fertilizer.

Total milk production in 2005 was an estimated 162 million litres, up 3 percent from the previous year, with approximately 13.6 million litres supplied by dairy cows. Of this growth, 98.9 million litres (47 percent) of local milk entered the formal market. However, the total consumption of milk (funneled through the formal milk market) was 528.2 million litres of liquid milk equivalent (LME), down from 76 million litres in 2003 (Table 1). FAO estimates for milk production in Sri Lanka in 2007 reached 174 million litres.

By 2004, an estimated 429.3 million litres of LME products were imported (provisional data), valued at 12.26 billion rupees. Imports are estimated to account for approximately 80 percent of domestic consumption.
Table 1: Production and availability of milk, 1998–2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Cow milk ('000 tonnes)</th>
<th>Buffalo milk ('000 tonnes)</th>
<th>Total milk ('000 tonnes)</th>
<th>Per capita availability (kg/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>124.48</td>
<td>25.09</td>
<td>149.57</td>
<td>4.80</td>
</tr>
<tr>
<td>1999</td>
<td>126.42</td>
<td>25.50</td>
<td>151.92</td>
<td>4.99</td>
</tr>
<tr>
<td>2000</td>
<td>127.74</td>
<td>25.52</td>
<td>153.26</td>
<td>4.96</td>
</tr>
<tr>
<td>2001</td>
<td>129.02</td>
<td>25.58</td>
<td>154.58</td>
<td>4.90</td>
</tr>
<tr>
<td>2002</td>
<td>129.09</td>
<td>25.64</td>
<td>154.73</td>
<td>5.3</td>
</tr>
<tr>
<td>2003</td>
<td>132.22</td>
<td>25.56</td>
<td>157.78</td>
<td>5.47</td>
</tr>
<tr>
<td>2004</td>
<td>134.88</td>
<td>25.84</td>
<td>160.72</td>
<td>5.34</td>
</tr>
<tr>
<td>2005</td>
<td>136.67</td>
<td>26.12</td>
<td>162.79</td>
<td>5.37</td>
</tr>
</tbody>
</table>

Source: Department of Census and Statistics, Sri Lanka

Production areas

Milk is produced in all districts, with the lowest in the conflict-affected northern districts. According to the 2002 agriculture census, the largest cattle populations are found in the country’s dry and intermediate zones. The wet mid- and up-country areas are often perceived as the main dairy-producing areas (Table 2). The dry and dry intermediate zones produce 50 percent more milk than the wet and wet intermediate zones.

Table 2: Milk production zones in Sri Lanka

<table>
<thead>
<tr>
<th>Zone features</th>
<th>Dry zone</th>
<th>Coconut triangle</th>
<th>Mid-country</th>
<th>Upcountry &amp; estate</th>
<th>Wet zone &amp; urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Dry zone districts in the NC, Northern and Eastern Provinces and parts of Central, Southern and NW Provinces</td>
<td>Intermediate and wet zone areas of the NW Province, and Gampaha district of the Western Province</td>
<td>Wet zone areas in the Central Province –Kandy and Matale districts</td>
<td>Nuwaraeliya district in the Central Province and Badulla district in the Uva Province</td>
<td>Districts in the Western, Southern and Sabaragamuwa Provinces and cities</td>
</tr>
<tr>
<td>Animal types</td>
<td>Indigenous cattle, Zebu cattle and crosses, buffalo</td>
<td>Crosses of exotic breeds, Zebu types, crosses of indigenous animals and buffalo</td>
<td>Pure exotic animals and crosses, and Zebu crosses</td>
<td>Pure exotic animals and crosses</td>
<td>Crosses of exotic breeds and Zebu type and indigenous animals and buffalo</td>
</tr>
<tr>
<td>Husbandry</td>
<td>Free gazing, or nomadic-type</td>
<td>Medium-sized herds, limited grazing tethered under coconut palms</td>
<td>Small herds, some tethering, stall feeding</td>
<td>Small herds, zero grazing</td>
<td>Limited grazing, medium-sized herds or small herds, zero grazing</td>
</tr>
<tr>
<td>Herd size</td>
<td>Few: 25 cows</td>
<td>5 cows</td>
<td>2–3 cows</td>
<td>1–2 cows</td>
<td>2–3 cows</td>
</tr>
<tr>
<td>Average yield</td>
<td>2.1 litres/cow/day Total 300–400 litres/cow over 180–200-day lactation</td>
<td>3–4 litres/cow/day Total 500–800 litres/cow over 200-day lactation</td>
<td>2–4 litres/cow/day Total 1 300 litre/cow</td>
<td>6 or more litres/cow/day Total 1 700 litres/cow</td>
<td>3 litres/cow/day Total 1 500–1 600 litres/cow</td>
</tr>
</tbody>
</table>

Source: Ranaweera and Attapattu 2006
Cattle

The average cattle or buffalo farm has around five head of stock, with significantly larger herds in the dry zones. In the wet and intermediate zones, there are two to three head per farm. Only about 12 percent of the cattle are found in the wet zone, with the majority of the better dairy breed stock found in that area. The rest of the cattle are spread equally between the dry and intermediate zones. Some 32 percent of the total cattle population is in the four dry intermediate zone districts, and more than three-quarters of cattle are in either the dry or dry intermediate zones. The 2.2 million cattle and 0.98 million buffalo reported in 1989 decreased to a combined 1.2 million in 2006 (Table 3). There is now an increasing trend in the percentage of upgraded dairy animals, including dairy buffalo.

Table 3: Number of dairy cattle

<table>
<thead>
<tr>
<th>Milk cows</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milking at present</td>
<td>2003 2004 2005 2006</td>
</tr>
<tr>
<td>211 800</td>
<td>216 050 222 300 229 230</td>
</tr>
<tr>
<td>277 400</td>
<td>284 420 288 570 295 840</td>
</tr>
<tr>
<td>Milking not at present</td>
<td></td>
</tr>
<tr>
<td>207 600</td>
<td>211 640 215 620 220 990</td>
</tr>
<tr>
<td>Bulls</td>
<td></td>
</tr>
<tr>
<td>178 800</td>
<td>182 290 185 720 189 110</td>
</tr>
<tr>
<td>Calves</td>
<td></td>
</tr>
<tr>
<td>263 100</td>
<td>266 500 272 810 279 480</td>
</tr>
<tr>
<td>Total cattle</td>
<td>1 138 700 1 160 900 1 185 020 1 214 650</td>
</tr>
</tbody>
</table>

Source: Agriculture and Environmental Statistics Division, Department of Census and Statistics, Colombo

Nuwara Eliya district has the highest average production per head, and the wet zone average production of 278 litres per head is more than double that achieved in the intermediate zone (130 litres per head) and two and a half times that of the dry zone (102 litres per head). Per-head productivity reflects the proportion of improved dairy genetics and the proportion of adult female stock in the herd.

Location and scale of livestock operations

The majority of livestock are reared in small-scale operations. Many factors influence the distribution of livestock in Sri Lanka; dominant among them are agro-ecological zoning and proximity to markets and feed resources. Tables 4 and 5 present some of the important topographical and climate information regarding dairying systems.

Table 4: Main dairy production systems in Sri Lanka

<table>
<thead>
<tr>
<th>Production systems</th>
<th>Average daily milk production per cow (litres)</th>
<th>Popular management system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hill country</td>
<td>6–8</td>
<td>Intensive</td>
</tr>
<tr>
<td>Mid country</td>
<td>4–5</td>
<td>Semi-intensive</td>
</tr>
<tr>
<td>Coconut triangle</td>
<td>3–3.5</td>
<td>Tethered</td>
</tr>
<tr>
<td>Low country dry zone</td>
<td>1–1.5</td>
<td>Extensive</td>
</tr>
<tr>
<td>Low country wet zone</td>
<td>3–3.5</td>
<td>Tethered</td>
</tr>
</tbody>
</table>

Source: Bandara, 2007

Table 5: Cattle and buffalo systems: Topography, climate and animal types

<table>
<thead>
<tr>
<th>Production system</th>
<th>Rainfall (mm)</th>
<th>Temperature range (°C)</th>
<th>Animal species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hill country</td>
<td>&gt;2 000</td>
<td>10–32</td>
<td>Pure exotic and crosses</td>
</tr>
<tr>
<td>Mid country</td>
<td>&gt;2 000</td>
<td>10–32</td>
<td>Pure exotic and crosses; some Zebu crosses</td>
</tr>
<tr>
<td>Coconut triangle</td>
<td>1 500–2 500</td>
<td>21–38</td>
<td>Crosses of exotic breeds, Zebu types, indigenous animals, buffalo</td>
</tr>
<tr>
<td>Low country dry zone</td>
<td>1 000–1 750</td>
<td>21–38</td>
<td>Zebu types, indigenous animals and their crosses, buffalo</td>
</tr>
<tr>
<td>Low country wet zone</td>
<td>1 875–2 500</td>
<td>24–35</td>
<td>Crosses of exotic breeds, Zebu types, indigenous animals, buffalo</td>
</tr>
</tbody>
</table>

Source: Ibrahim et al. (1999a and b)
Marketing

The marketing of milk in Sri Lanka is complex and varied. There are individual farmers who sell direct to processors, consumers, hotels, cafeterias and canteens. Cooperatives are organized primarily for the purpose of collecting and selling milk to either hotels or processors. The formal, or processed dairy, market consists of small dairy cooperatives, larger local cooperatives, district dairy cooperatives, dairy cooperative unions and networks of collection points and milk chilling centres operated by cooperatives or the main dairy processors. Most farmers are not members of cooperatives or farmer societies. There are a few large-scale processors who have organized farmers to sell their milk to them.

Contributing to the informal market are small private milk collectors, small local processors of traditional dairy products, retailers and dairy producers who sell directly to hotels and restaurants or to consumers. Small local processors of modern dairy products also contribute to the supply.

Marketing institutions

Milk is currently sold through a combination of private and public organizations working in tandem with each other. Until 1981, farmers sold their milk to the National Milk Board (NMB), which was created in 1957 as the main outlet for milk purchases. Through the policy of liberalization and privatization introduced in 1981, Nestlé bought 80 percent of its shares and has since been operating in the country as a major player. Nestlé's milk collection network currently involves more than 25 000 farms and represents an estimated 40 percent of the total fresh milk collected nationwide.

Also in 1981 through the government-owned Cooperative Wholesale Establishment (CWE), Lanka Milk Foods (LMF) Ltd was established to package and distribute imported milk powder. Currently, LMF maintains an important market position in the milk-food industry, with its key brand of full cream milk powder Lakspray and a capacity of 48 000 million tonnes per year. In 1991, the Stassen Group of Companies, one of the largest conglomerates in Sri Lanka, bought 51 percent of the LMF shares; currently, LMF achieves an annual turnover of around 2 billion rupees.

Fonterra, another private company with New Zealand investment that sells a range of Anchor brand products, has been in Sri Lanka for many years. When first introduced, the only product in Anchor’s portfolio was Anchor Full Cream Milk.

The Government has a major involvement in the state-owned milk processing company MILCO, which engages in milk collection from farming areas. It also processes fresh milk, marketing it under the Highland brand.

The primary business of the formal private sector stakeholders are milk powder and other processed milk product imports. Nestlé is an exception, which runs a substantial milk powder-processing operation based on locally procured milk. In theory, all of the businesses extended their operations to procure fresh milk locally to cater to the developing market segments, such as liquid milk, pasteurized and sterilized milk, flavoured milks and yogurt. Locally procured milk is used for making ice cream and mixed-flavoured fruit drinks.

Over time, however, there have been changes in the composition of the milk-processing organizations, with collaboration through Indian investment as well as World Bank assistance. A number of other private sector processors, some of them extremely small, are involved in the milk-processing industry. The private sector is also engaged in milk collection and processing, but due to the low volumes in the production areas, there is wasteful competition by the different collecting agencies fighting for the available milk in a given area. In addition, lack of other marketing infrastructure, such as chilling tanks and transport vehicles, compound the problem.

According to a study by Ranaweera and Attapattu (2006), total milk collection increased by 13 percent in 2004 because of the increased price paid for milk (from 15 rupees per litre to 16 rupees per litre and then 18 rupees per litre), along with an improved collection network. This encouraged dairy farmers to produce more milk.
In 2004, there were 245 active dairy cooperatives along with six cooperative unions that had a total membership of around 57,000 members, of which some 30,000 were members (including the dairy federation). However, the number of dairy cooperatives declined from 2001 to 2004.

Most processors use imported milk powder for their products, except Nestlé, which purchases significant quantities of milk powder using locally procured milk. Imported milk powder has been quite controversial because it is subjected to low tariff measures in order to keep consumer prices low. The only way to increase dairy productivity is for the Government to increase the tariff on imported milk powders from the present 10–30 percent, which is unlikely due to World Trade Organization commitments. However, high international dairy commodity prices appear set to push powder prices even higher than such tariff increases would deliver.

The informal milk market plays a larger role than assumed. It is an important outlet for many smallholder farms and is critical for ensuring economic viability of dairy production for many producers because it typically provides higher prices. It also delivers many viable income-generating opportunities for small entrepreneurs. The public health risks in informal market channels, however, are uncertain, and will depend on consumer practices, such as boiling of milk before consumption. Growth in the informal market is likely when retail powder prices increase and fresh liquid milk becomes more competitive. That growth will probably continue, partly at the expense of the formal sector, until the formal market of liquid milk is better able to reach consumers.

Significantly, even after 25 years of activities within the dairy sector, there is no fresh milk available in the market. And the entire milk food industry is in the hands of just two or three large companies, namely Nestlé, Fonterra and Maliban, which primarily market only imported and locally processed milk powders.

**Figure 1: Sri Lankan fluid milk prices**

![Sri Lankan fluid milk prices graph](image)

Pricing systems prevailing in the country are biased towards satisfying millions of consumers rather than producers of milk and milk products. The high opportunity cost of labour relative to the farmgate price of milk discourages farmers from intensive dairy farming. A rough estimate of the current farmgate price of milk to wage ratio is 1:13. Consequently, the value of one litre of milk sold at the farmgate is only one-thirteenth of a daily casual wage.

Unlike milk powder, the consumption of fresh milk appears to increase with income, suggesting that as incomes increase over time, demand could shift towards liquid milk. This presents good opportunities for smallholders who are involved in domestic dairy production. Domestic producers have a comparative advantage in the liquid milk market because reconstituted milk is not a good substitute. Awareness on increasing the market for such sales needs to be considered.

World market prices for milk powders have increased dramatically over the past year and are now more than double what they were in June 2006. This is already being felt in the wholesale market and in the cost of raw materials used by some companies to recombine for manufacturing “fresh” products, such as yogurt and flavoured milk. These companies also are struggling to increase local milk procurement as milk becomes more cost competitive. Payment of premiums to secure that milk is likely to become more common.

Because the profit margin is very low, there have not been adequate incentives offered to the producers to invest in dairy herds. Adequate recognition has not been given in the past to the important role played by
smallholders, despite the difficulties they experience in operating at near subsistence level. Due to the limited economic opportunities, many of them will continue to remain in dairy farming for more years to come (SLVA, 1995).

Farmgate milk price is largely determined by MILCO’s processing and marketing costs, both of which are reputed to be relatively high. The Government uses the farmgate price as a political tool because it needs MILCO to cover its costs. Reducing the amount of milk diverted to powder production at MILCO will reduce the downward pressure on farmgate prices caused by relatively inefficient processing and marketing. The large private firms engaged in milk product manufacturing follow the purchasing prices offered by MILCO. They do pay a premium above MILCO’s price, depending on the competition in the local market where they operate. While this appears to serve the interests of the suppliers favourably, there is little inclination for them to buy the surpluses available during months of high milk production due to capacity constraints. In such instances, MILCO has to step in to buy the excess milk.

Till now, the milk price increases have not been reflected in increased local retail market prices. Consequently, there has not been any financial incentive for consumers to favour liquid or fresh milk products made from local milk. When the retail price of powder reflects the changes in international commodity prices, it is likely that the retail market price for fresh products will increase, also fuelling the upward pressure on the farmgate price. This scenario may provide a unique opportunity for further development of the dairy sector.

Table 6: Average cost of milk production and producer price, 2006 (rupees/litre)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Wet lowland</th>
<th>Mid country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Village 1</td>
<td>Village 2</td>
</tr>
<tr>
<td>Excluding family labour</td>
<td>5.56</td>
<td>4.10</td>
</tr>
<tr>
<td>Including family labour</td>
<td>16.77</td>
<td>12.67</td>
</tr>
<tr>
<td>Announced purchase price</td>
<td>11.29</td>
<td></td>
</tr>
</tbody>
</table>

Source: Ranaweera and Attapattu 2006

Smallholder dairy farmers

Smallholders dominate the livestock industry, with an estimated 3.5 million people (including dependants) finding livelihood within the sector. The sector contributed 22.5 billion rupees to the GDP (0.8 percent of the national GDP and 8.5 percent of the agricultural GDP) in 2004. Some 17.9 percent of households own livestock and approximately 70 percent of them own cattle (SLIS, 1999–2000). The dairy animal population consists of 1.21 million cows (Department of Census and Statistics, 2006).

Dairying is predominantly a smallholder, mixed crop–livestock operation. Animals are mostly fed on natural grasses available in common lands, such as roadsides, railway banks, fallow paddy fields, tank beds and other vacant lots, all maintained under rain-fed conditions (Presidential Sub-Committee Report, 1997).

Currently, hundreds of thousands of smallholders operating at near-subsistence levels dominate the local milk production in these systems. The number of dairy farmers is estimated to be about 400 000, of which 200 000 provide milk to the formal sector.

Dairying is part of a partially closed, mixed farming system at the smallholder level. Some of the waste of the dairy unit, such as dung, urine and wasted-feeding materials, are used as manure for crop farming; some of the crops and crop wastes are fed to the animals. In addition, the cultivation of forages has helped to control soil erosion and improve soil fertility. Hence, dairying at the smallholder level is an environmentally friendly activity when it is properly managed within the farming system (SAEC, 1998). The production system can be classified into five main subsystems, as shown in Table 2.
A minimum of 15 litres daily production is needed to earn a reasonable income from dairy farming at the smallholder level. Three-cow equivalents of upgraded dairy animals with an adequate cattle shed and a fodder plot of more than 20 perches are needed to allow a smallholder to make this profit.

However, the majority of smallholders do not have these minimum requirements. There is a need to improve their dairy farms. On average, a minimum of 50 000 rupees ($500) of new investment is needed for each smallholder. This is beyond the capacity of most farmers, due to their subsistence living conditions. Although credit programmes are available in commercial banks, farmers have to pay back the loans within three to four years, with an annual interest of 18–20 percent. More concessionary credit programmes are needed that take into account the prevailing returns and profit margins of smallholder farmers.

Furthermore, dairying is not the main source of income for most of the smallholders and, in most instances, is not the activity of the husband in the family. In fact, housewives do most of the dairy-related activities while also attending to their other family obligations. Although nearly 40 percent of the members of registered dairy cooperatives are women, they are rarely represented in the management or executive committees of these organizations. However, when housewives do have a role in managing household dairy activities and their dairy cooperative, a substantial improvement can be seen in the economy of the family.

Validating constraints to the sector: A stakeholder survey

Ranaweera and Atapattu carried out a limited stakeholder survey in 2006 with the objectives of i) validating the continued relevance of the constraints frequently cited in various sector studies and ii) assessing the strength of the current service infrastructure to serve the needs of smallholder dairy farmers.

The survey covered 25 dairy farmers from the Badulla district in the upcountry, which is a highly productive area. Most farmers in the region are smallholder, commercial dairy producers who supply milk to collectors. The sample for the survey was selected from a dairy cow record-keeping in the Department of Animal Production and Health (DAPH) project to identify superior animals for use in the calf-supply programmes and to monitor responses to changing conditions. The 25 respondents were selected randomly and interviewed during home visits. Data collected focused primarily on the cost of milk production and delivery of services by the State and other parastatals.

The results of that small survey are summarized as follows:
1. The dairy farmers in the sample, being participants of a milk yield-monitoring programme, received closer attention from veterinary services maintained by the State and hence were more privileged than the average farmer. Except for two farmers who did not have a single visit by a veterinarian surgeon during the year, others were well served.
2. Nearly 90 percent of the farmers were keen to expand their dairy operations and 45 percent cited difficulty in obtaining young animals as the major constraint.
3. Another 40 percent identified financial constraints, part of which was due to the cost of animals.
4. Only 24 percent of the farmers had made any significant investment in the previous year in the form of buying new animals or improving sheds. In all these instances, they had participated in a sponsored programme with funds made available as a grant.
5. Twenty-eight percent of the farmers were located within 2 km of a veterinarian’s office, with 64 percent located within 5 km. All the farmers who had new calves born in the previous year had used AI services.
6. Only 36 percent of the farmers were members in a dairy cooperative. Sixty-two percent of them not belonging to a dairy cooperative cited management problems, whereas 18 percent considered it a hassle, while another 18 percent cited poor pricing.
7. Milk marketing appeared to be happening in an orderly manner, with the production of 52 percent collected by a local collector and another 40 percent supplying MILCO. Forty-four percent had their milk collected at the farm, with another 36 percent transporting it less than 1 km. Only one farmer transported milk more than 5 km.
8. Around 60 percent of the farmers complained that the price paid for their milk was too low. An increase in price would encourage them to invest in more animals.
Case studies of nine farmers

Another survey conducted in 2007 among a sample of nine farmers from three districts, representing a cross-section of the dairy farming community, looked to assess the production and marketing structure in the field and to identify issues challenging dairy farmers. Essentially, they were case studies of dairy farmers representing two groups of farmers: one that sold their milk to Nestlé (a private processor) and one that sold to the informal sector.

Table 7: Survey results on the dairy industry: Cost of fluid milk production, 2007

A. Resources base

<table>
<thead>
<tr>
<th>Informal farmer</th>
<th>Cows in milk</th>
<th>Pregnant</th>
<th>Heifers</th>
<th>Bull calves</th>
<th>Female calves</th>
<th>Grazing (perches)</th>
<th>Pasture land (perches)</th>
<th>Grass land (perches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>07</td>
<td>05</td>
<td>03</td>
<td>02</td>
<td>02</td>
<td>-</td>
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<td>08</td>
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</tbody>
</table>

Nestlé farmer

<table>
<thead>
<tr>
<th>Informal farmer</th>
<th>Cows in milk</th>
<th>Pregnant</th>
<th>Heifers</th>
<th>Bull calves</th>
<th>Female calves</th>
<th>Grazing (perches)</th>
<th>Pasture land (perches)</th>
<th>Grass land (perches)</th>
</tr>
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<tbody>
<tr>
<td>6</td>
<td>03</td>
<td>01</td>
<td>-</td>
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<td>-</td>
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<td>26</td>
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<tr>
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B. Production

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<th>Income from sale of fertilizer rupees</th>
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Nestlé farmer

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* Buffalo

C. Operational costs (rupees)

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<th>Drug fees</th>
<th>Stud fees</th>
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Nestlé farmer

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### D. Income/expenditure (rupees)

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<td>106 300</td>
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<td>103 300</td>
</tr>
</tbody>
</table>

### Survey highlights

- The sample farmers owned significant numbers of animals (except those who sold to Nestlé), although they were smallholder farmers, with most having grazing land or pasture land.
- Milk production was reasonable, varying from 10 to 75 litres per day.
- Very little milk was consumed at home – on average, 1 litre per day, and the rest was sold in the open market or with Nestlé.
- The respondents reported obtaining a reasonably high price for their milk, varying from 15 to 22 rupees per litre. In addition, a few farmers earned income from selling fertilizer and manure.
- Most of the respondents’ operational costs were for concentrated feed and labour; the average daily wage rate was 500 rupees.

### Incomes

The net income of most of the farmer respondents was reasonably high and met all costs that were incurred, indicating that smallholder dairy farming was profitable. However, it was not adequate enough to improve and expand their operation because the capital costs, including the cost of animals, were quite high.

### Farmer perceptions on increasing herd size

1. The majority of farmer respondents wanted to increase their herd size. However, due to the shortage of grazing land (three of nine respondents) and difficulty in obtaining good animals (Five of nine respondents), they did not think it was a good idea.
2. Another constraining factor was the lack of private capital (three of nine respondents) and availability of credit facilities, particularly soft loans.

### Veterinary services

All respondents commented that the veterinary services were useful and available on time. Four of the nine farmers had more than three visits, while three of them visited the veterinarian twice a year. The distance to the veterinarian office was in close proximity to their farms (1–5 km).

### Financial services

- Most of the farmer respondents were self-financing and kept their operational costs low. Two of them have not incurred any significant capital cost.
- All the farmers complained that the financial services were difficult to obtain, with soft loans unavailable and thus a major constraint to increasing the herd size and also maintaining the nutritional requirements.
• All attempts to convince the authorities, including the processors, to provide credit facilities had not been successful.

**Marketing**

• Most of the farmers sold to private consumers, hotels and canteens, enabling them a better price. The farmer respondents did not have any difficulty in marketing their milk as they had a variety of opportunities that included private processors (Nestlé) and hotels, small-time canteens and cafeterias in the village or nearby cities. The Nestlé farmers also did not have any difficulty in selling their milk.
• The farmers had to take their milk to the collection point of the agent, which was about 1–2 km from their farm; the agent did not collect the milk at the farmgate.
• The prices received were reasonable enough to enable them to cover their costs. However, there were no opportunities for significant profits, which would allow them to expand their livestock operation.

**Joining a cooperative**

• Eight of the nine farmer respondents were not members of any cooperative.
• The reason given varied, but they unanimously believed it is not useful, primarily due to office bearers being corrupt and no gainful benefit is obtained through the society.
• Because selling their milk was not a problem, they did not see any need for a cooperative.

**Stakeholder perceptions on the industry's future**

• All the farmers agreed that they would continue with milk production – but at a subsistence level.
• They did not see much scope for expanding their operation primarily due to the low milk prices that were set by Government, which the processing agents followed.
• They believed that if the farmgate price was higher, their productivity would improve because they could invest in their farm.
• Unless there was a significant policy of the Government to encourage investment in the dairy industry, the farmers felt comfortable with their scope of current operations.
• With the increase in dependence on powdered milk, the farmers saw little scope for the consumption of fresh milk.
• With the current government emphasis on moving towards consumption of fresh milk, the farmers allowed they could have a change in attitude.

**Key constraints to development**

Considering the results from the two Ranaweera and Atapattu surveys (previously mentioned) and the problems and key constraints identified repeatedly over time in other studies, the following is a summary of the primary factors affecting the development of the sector:

• inconsistent policies for the industry;
• low productivity of animals;
• low farmgate price of milk;
• high cost of milk production;
• poor extension services and inadequate education on animal health among dairy farmers;
• absence of new investments in the livestock sector due primarily to a lack of state support and financial services;
• poor marketing options available and inadequate milk-processing facilities;
• failure to update the technologies, including the development of a proper collection and distribution network in the sector;
• absence of proper consumer education to appreciate the value of fresh milk and milk products.

Low farmgate prices are a function of relatively inefficient collection and processing systems, partly caused by low volumes and a market that is distorted by government influence. The large number of smallholder farmers with no economies of scale is in itself a major constraint because this increases the complexity and difficulty of service provision, the cost of input supplies and the cost of milk collection, which decreases farmgate milk value.

One of the key reasons for low productivity in the dairy sector is the poor feeding of stock, primarily due to low levels of farmer knowledge and understanding of basic animal husbandry or nutrition issues.

The cost of milk collection systems escalates with the number of smallholder farmers and is exacerbated by the different enterprises competing for the milk supply. Milk quality is always difficult to maintain in smallholder dairy farms and reliance on hand milking and with no effective cooling available. The sheer number of farmers creates major difficulties with extension effectiveness and farmer training. The ineffective cattle marketing system is also largely a result of the number of smallholder farms.

Stock availability

The productivity of cows is limited, in most cases, by nutrition rather than any genetic limitation for milk production. There is, however, a significant opportunity to improve both the productivity and the profitability of many smallholders by motivating and facilitating them to use improved breeds. This necessarily implies a simultaneous, or prior, improvement in nutritional management. The generally poor level of young stock feeding and associated late maturity has a major impact on herd output of surplus animals, as does the prolonged calving interval. If the nutritional limitations are minimized and farmer knowledge on feeding and breeding is improved, breeding efficiency will, in the long-term, help to increase the number of superior quality animals available as well as improve productive efficiency in the medium term.

Animal health management

Overall, the constraints to dairy production from disease threats are less severe than some other factors, such as nutrition and marketing. While many bovine diseases are prevalent in the areas of current and potential dairy production, there are well-documented health management practices for minimizing the risk of infection and productivity loss. Disease constraints to dairy productivity are thus associated with the need to improve the delivery of veterinary services to dairy farmers and to improve the quality of those services, especially for preventive medicine. Clearly these are policy and institutional rather than technical issues.

The major issues in animal health management are:
• improper approaches for animal disease control;
• lack of a clear strategy for control of diseases, such as foot-and-mouth disease;
• inadequate attention paid to disease prevention and bio-security aspects;
• high cost of veterinary pharmaceuticals;
• lack of strategy to harness the private veterinary practitioners to help the animal health management functions of the State.

Land availability

Limited land ownership by many dairy farmers constrains their ability to grow quality fodder for their cattle. Access to land for production of livestock forage and fodder is a critical issue if productivity gains in the sector are to be achieved. Land-growing grass is generally considered to be a waste of land because there is little appreciation of the potential value of quality grass or fodder for dairy stock feed.
There is a serious problem in exploiting the genetic potential of improved dairy animals due to the lack of good quality year-round feed at the farm level. This is primarily the result of pressure on agricultural land and competing opportunities for labour. There is significant seasonality of fodder supplies and prices, especially in hill and mid-country areas, which is where most of the upgraded dairy animals are found and where farmers depend on purchased concentrated feed to meet some of their maintenance requirements during the driest months of the year. Management of common grasslands, such as communal grazing land, public land and roadsides is weak.

According to the Ten-Year Development Framework, an estimated 44 percent of agricultural land (about 20 percent of the total land area) is “sparsely used, which means there remains a great potential for these lands to be properly developed/used”. It also notes that “land vested in state authorities, which are not utilized, will be made available for proper development purpose”. It stops short of stating that this land will be made available to the private sector, but the Livestock Development Policy paper acknowledges that “State lands will be made available to the private sector to promote superior planting materials for feeds and fodder and to demonstrate appropriate cultural practices of production and harvesting”. It also states that “while no land resources of NLDB will be privatized, allocation of state lands for the promotion of the private and corporate sector for organized programmes for livestock development will be actively encouraged”.

**Farmer knowledge and skills**

Hardly anything worthwhile has happened in the fodder development in the country. Land is not specifically allocated for forage, and grasses are not accepted as a “crop”, even though farmers do not fully use available local feed resources. As a result, large quantities of available local feed resources are currently wasted.

Compound cattle feed is not popular among most smallholders. Instead, they use feed ingredients such as coconut cake and rice bran. A few large-scale feed millers control the feed industry in the country. Rapid growth has been seen in the production of poultry feeds. However, more than 80 percent of the ingredients are imported, and production of compound feeds is an externally dependent system and vulnerable to changes in world market prices.

Previous studies have stressed the importance of increasing the use of quality forages to improve the nutritional status, productivity and profitability of the herds. Currently, few farmers are taking advantage of opportunities to produce and use quality feeds. The production cost (fertilizer) of good-quality fodder is between an estimated 2 and 4 rupees (excluding any land costs), compared to poonac at an average of about 17 rupees. The nutritional value of good quality pasture is sufficient to allow it to substitute for poonac.

Significant improvements in technical efficiency could be achieved through the introduction and adoption of simple changes in husbandry and the way stock is managed. Water is an essential component in any diet and especially critical for a lactating cow, which has additional losses in milk that need to be met. Increased use of low-cost, high-quality grass and forage as a substitute for high-priced concentrated feeds and poonac should improve the profitability of dairying. In many areas, smallholder dairy farmers do not have adequate land to grow grass or do not have secure access or rights to use existing grasslands.

**Extension system limitations**

The number of veterinary surgeons employed by the DAPH has risen markedly in recent years, but the cadre of livestock officers and livestock development inspectors has stagnated. It is the inspectors who are primarily responsible for providing extension and AI services to farmers. While these two roles are somewhat synergistic, it is apparent that the lack of inspectors dictates that the breeding service is prioritized and extension services are provided on an ad hoc basis. This lack of an extensive extension programme affects the development of the industry.

**Other constraints**

The key constraint to further developing the dairy industry is low profitability stemming from a relatively low farmgate price for milk, low productivity and the high cost of production. Stakeholders in both the
public and private sector agree that the greatest constraint in the short-term expansion of the dairy sector by commercial medium- and large-scale farmers is the availability of good-quality dairy stock.

1. easing stock availability through improved breeding will be a slow process. If there is no substantial investment in commercial medium- and large-scale dairy farming in the short term, there will be a serious shortage of quality dairy stock.

2. There is no effective market for dairy stock. Also, no organized system exists for interested buyers to contact agents or for agents to contact each other to broker deals. Farmers sometimes resort to selling stock to butchers.

3. Access to land for the production of livestock forage and fodder is critical if productivity gains in the sector are to be achieved. However, access to land alone will have little impact on dairy productivity and profitability unless there is a change in attitude to deliberately grow pasture or fodder for stock.

4. Extension service provided by the Government to farmers is largely ineffective because the training provided to the frontline agents is insufficient. Although commercial milk processors provide services to their clients (farmers), they focus on milk collection. There is a need to train extension providers in methodology as well as on various aspects of animal husbandry.

5. Growth in the informal market is likely when retail powder prices increase and fresh liquid milk becomes more competitive. Growth will probably continue, partly at the expense of the formal sector, until the formal market of liquid milk is better able to reach consumers. There is a lack of small-scale processing, which constrains farmers’ opportunities for obtaining higher prices for their milk.

6. The Government controls the retail price of milk powder. This constrains the price that locally produced milk powder can be sold for as well as imported powder. Farmgate milk price paid by MILCO is therefore largely determined by their collecting, processing and marketing costs – all of which are reputed to be relatively high. Because the retail price of powder reflects the changes in international commodity prices, it is likely that the retail market price for fresh products will increase also, fuelling the upward pressure on farmgate prices.

Conclusions

The dairy sector is regarded as the priority sector in livestock development for public investment. Promoting a liquid milk market, expanded to the regions outside the traditional centres of milk consumption, is a precondition for increasing the competitiveness of domestic milk.

The policy goal in developing the livestock sector is to achieve sustained and equitable economic and social benefits to livestock farmers while increasing the supply of domestic livestock produce at competitive prices for consumers.

To achieve this objective, the strategic approach for promoting livestock production for food security is planned as follows:

- promote a liquid milk market, expanded to the regions outside the traditional centres of milk consumption, as a precondition for increasing the competitiveness of domestic milk;
- upgrade the native herd as a fundamental necessity for dairy development, while encouraging the active involvement of the private sector;
- transform the current subsistence-level dairy production into a viable commercially oriented activity;
- focus import policy and fiscal policy on dairy products to provide a conducive environment for the domestic dairy industry, with market forces governing the pricing of domestic milk;
- strengthen development of a viable, medium-to-large scale, commercially oriented private sector engaged in dairy production, which is crucial for the long-term sustenance of the domestic dairy industry;
- empower dairy farmers and facilitate their participation and that of the processors in the value chain of dairy products;
- promote livestock production among vulnerable groups and increase the protein intake by livelihood diversification in rural areas.
From a technical perspective, dairy farmers and processors can be empowered to further participate in the value chain of dairy products by:

- strengthening artificial insemination delivery and breed-improvement programmes;
- institutional improvements for delivery of veterinarian care services and animal health management;
- stronger extension services and human capital development;
- value addition at the village level.

Of paramount importance in developing the livestock sector is the feed resource base, including pasture and other natural forages as well as coarse grains, agricultural waste and by-products:

- Government can facilitate the trading of feed ingredients for the livestock industry while providing adequate protection and incentives for the growing and local production of feed resources.
- To develop a viable commercial dairy industry, an efficient corporate sector for the manufacturing of compounded feed for dairy farming is essential.
Annex I: Supply chain for milk

Annex II: A constraint analysis

Annex III: Flow chart of the dairy industry in Sri Lanka
Background

A Medium-Term Development Plan for Dairy (1989–1993) and its accompanying dairy industry development model (DIDM) signalled a new era for the dairy industry – after its near-termination in 1986. The Department of Agriculture at that time had declared that all support for dairy activities would stop and that the Philippines would simply import its dairy requirements. The government agency involved in dairy development, the Philippine Dairy Corporation, began the process of dissolution and its assets were being prepared for public auction. But then a new agriculture secretary (Carlos G. Dominguez) met with dairy farmers in 1988 and reconsidered the department’s previous position. It was this second chance that initiated the new dairy plan.

The most distinct component of the new plan was a strategy initially called the “zero-base approach” – the Department of Agriculture was not going to support dairying nationwide. Instead, it would be introduced and assisted only in areas found suitable, based on pre-determined parameters. It would also address weaknesses in the previous dairying efforts (identified in an assessment): Dairy production sites were too dispersed, selection of farmer participants was arbitrary and often based on political considerations, the few existing processing facilities were either too old or too big for the current production volumes and the cooperatives were not functioning as enterprises.

These insights guided the designing of the DIDM, also called the dairy zone model. The plan defined each component of the system, which then became the content of orientation seminars for prospective farmers. Only areas that passed the set criteria were considered as dairy development sites. As shown in Annex V containing the detailed criteria, the model provided “musts” for the production unit (at least four adjacent villages, access to forage area, water, etc.), the collection centre (quality testing capacity, handling and delivery equipment), the processing facility (appropriate capacity specified), a market base (located within a 35-km radius of an urban centre) and the appropriate dairy enterprise or cooperative.

In the early 1990s, three zones were established: in Davao and Cebu in areas where no dairy activity had ever taken place and in Cagayan de Oro/Misamis Oriental, where there were some dairy farmers from an earlier programme. There were existing dairy operations in Laguna and Bulacan, both geared to supply the Metro Manila market. Although there are other visibly more profitable dairy enterprises in the area, they are private commercial ventures that don’t make information about their operations regularly accessible and thus are not included in this case study report.

In 1992, the Philippine Carabao Center (PCC) was created through legislation to pursue the conservation, propagation and promotion of the water buffalo as a source of milk and meat, in addition to draught power and hide leather.45

In 1993, the Dairy Confederation of the Philippines (Dairycon) became the first national organization of smallholder dairy farmers.46 The Dairycon organized its first National Dairy Congress in Cagayan de Oro City, attended by its five founding dairy federations. Since then, the Dairy Congress meets regularly (every two years initially and now annually) as a forum for various dairy groups to come together to see the latest in dairy equipment and products and discuss technical and other issues.
In 1995, the newly enacted National Dairy Development Act created the National Dairy Authority – a sure sign that dairying would be pursued as a matter of national policy. Table 1 captures the transition of the local industry since the enactment of that legislation. In dominantly carabao-based dairy areas, the PCC assists dairy farmers. In areas served by the NDA, farmers with all types of dairy animals receive technical support.

Table 1: Philippine dairy industry indicators

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<td>6 820</td>
<td>6 879</td>
</tr>
<tr>
<td>Goat</td>
<td>784</td>
<td>754</td>
<td>649</td>
<td>707</td>
</tr>
<tr>
<td>Dairy import cost (CIF – in US$ million)</td>
<td>438.29</td>
<td>402.17</td>
<td>421.33</td>
<td>457.30</td>
</tr>
<tr>
<td>Dairy import volume¹ in LME (in million litres)</td>
<td>1 605.14</td>
<td>1 853.16</td>
<td>1 353.39</td>
<td>1 510.68</td>
</tr>
<tr>
<td>Per capita milk intake in litres per year</td>
<td>16</td>
<td>16</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Number of farm families engaged²</td>
<td>4 066</td>
<td>8 197</td>
<td>13 077</td>
<td>14 347</td>
</tr>
<tr>
<td>Total employment in the dairy industry</td>
<td>4 066</td>
<td>8 197</td>
<td>17 020</td>
<td>19 583</td>
</tr>
<tr>
<td>Number of dairy enterprises</td>
<td>58</td>
<td>118</td>
<td>289</td>
<td>315</td>
</tr>
<tr>
<td>Number of children supplied in milk feeding programmes</td>
<td>12 750</td>
<td>20 932</td>
<td>96 167</td>
<td>29 843</td>
</tr>
</tbody>
</table>

¹ Import volumes are net of re-exports by importer/processors.
² Source: The Bureau of Agriculture Statistics (the first survey of farmers engaged in dairying was conducted in 1960).

In the mid 1990s, the Government experimented with big commercial farms by establishing three of them in different parts of the country. Each one was stocked with some 200 animals, provided with milk processing facilities and managed by cooperatives. By 2000, all three projects had been dismantled. Each commercial farm had failed to sustain operations; they had been unable to amortize loans used to set up the facilities and had run out of funds to cover overhead costs, including the farm personnel. This failure underlined the lesson that small producers maintain a competitive edge, based on the low overhead incurred per farm. Today, bigger private commercial farms that raise dairy stocks maintain raw milk supply arrangements with small producers.

In 2001, the NDA returned to the dairy zone model. There are now 15 zones throughout the country.³⁷ A profile of these zones is attached as Annex II. More information on the dairy zones and emerging zones is contained in Philippine Dairy Zones (2007), a booklet published by the National Dairy Authority.

There were also dairy federations in place in those five dairy zones; after a stall in the programme’s approach in the mid 1990s, the federations took prominence and now run the business of the cooperative using their own capital, pay a monthly lease to the NDA for the use of the plant, hire their own staff, cover the maintenance and repair of the facilities and pay dividends to members.

The history of the Philippine dairy industry is marked with failed government and private ventures in big farms going on their own. Somehow, a cluster of smallholders that fill the capacity of the core farm has improved the viability of the bigger farms. In turn, smallholders have benefitted through dividends received as members of the cooperative federation or through higher milk procurement prices offered by private farms during dry periods.

Industry overview

The Philippines’ dairy industry consists of two distinct sectors: One is the milk powder-based sector that imports, re-processes and repacks milk and milk products. The other is the liquid milk sector that has an imported UHT milk component and a locally produced fresh milk component.

Although Filipinos are generally considered non-milk drinkers, with consumption at 19 kg per person per year, the Philippine dairy market, including the market for imported milk, generates more than US$1 billion in revenues annually. Some 44 percent of the demand for milk is concentrated in Metro Manila.

The two players in the dairy market (Table 2) – the importer/re-processors and the local producer/processors – are very distinct from each other. The importing sector is dominated by three importer/re-processors that accounted for 55 percent of total imports in 2006. More than 80 percent of milk product imports is in powder form. The importer/processors also import ready-to-drink milk. Local milk producers supply barely 1 percent of the total supply in LME, or about 30 percent of the liquid milk supply. In 2006, local milk production was about 13 million kg. In gross weight, this represented 5 percent of total supply. In terms of liquid milk equivalent, local production barely accounted for 1 percent. In the liquid milk category, local milk accounted for about 30 percent of supply. Although liquid milk continues to account for a small portion in the big dairy scheme, it started to gain significance when imports of ready-to-drink milk in Tetra Pak cartons doubled from 2000 to 2005.

Table 2: Market shares in the liquid milk market

<table>
<thead>
<tr>
<th>Market shares</th>
<th>Importers/re-processors</th>
<th>Local milk producers/processors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total milk and milk products market</td>
<td>100</td>
<td>99%</td>
</tr>
<tr>
<td>Liquid milk market</td>
<td>3</td>
<td>70</td>
</tr>
<tr>
<td>Powder and other milk products</td>
<td>97</td>
<td>100</td>
</tr>
</tbody>
</table>

The industry structure can be seen in the milk price chart in Annex III, with the liquid milk moving through a simple trading route, compared to the local milk production-processing-distribution system that involves many stages and thereby generates more employment and rural incomes. The milk flow chart (Annex IV) illustrates the movement and links between various types of producers, processors and final consumers. It is complemented by a table of imports in Annex V. The actual product mix of the commercial players can only be deduced from import figures.

The local dairy farm sector is small, comprising 13 000 families and some 300 dairy enterprises. The total dairy herd consists of some 28 000 head, of a total livestock population of 9.6 million. The single biggest obstacle to dairy development is the shortage of dairy animals. Hence, programmes to upgrade local animals to dairy breeds are dominant livestock interventions. Recent pronouncements from the Department of Agriculture have indicated the intent to concentrate on the upgrading of native carabao.

Located within dairy zones, smallholder dairy farmers (with 2–10 cows) and bigger producers (with 20–400 cows) operate side by side. Annex VI provides the findings of a 2002 survey by the Bureau of Agriculture Statistics indicating that 4 194, or 85 percent, of 4 957 farmers surveyed owned 1–5 dairy animals. Including the farmers owning 5–10 dairy animals, the percentage of smallholder dairy farmers rises to 96 percent.

Coffee shops, hotels, restaurants, supermarkets and small grocery shops make up the commercial outlets for local milk and absorb about 60 percent of production. Local government units that sponsor milk feeding programmes consume about 40 percent. As provided by law and implemented by the National Dairy

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48 Import volume of ready-to-drink milk increased to 45 710 tonnes in 2005 from 22 080 tonnes in 2000. Over the same period, the cost of these imports tripled to US$33.95 million from $11.65 million.

Authority, smallholder dairies have priority as suppliers of government-sponsored milk feeding programmes. The significant impact of milk feeding on decreasing the incidence of malnutrition encourages local governments to support these programmes. For social and political reasons, the local officials greatly appreciate the concept of nutrition for the children and income for the farmers.

**Important trends contributing to dairy development**

From 2001 to present time, a number of trends in the local dairy sector have helped to accelerate development. These factors indicate that collaborative efforts among national and local governments and dairy enterprises and support through official development assistance have been important growth drivers. Operating in a trade regime of liberalization, the local dairy sector of the Philippines hardly enjoys any protection, with tariffs on dairy imports down in the range of 0–3 percent. Quality assurance has received a big boost in recent years, highlighted by the introduction of milk payments based on quality in some zones.

The law and the national development plan promote smallholder dairying, as contained in the following relevant provisions:

**Section 3. Objectives:**

1. to give support and assistance in the production, processing and marketing activities of all those engaged in the business of producing milk and other dairy products, particularly rural-based small dairy farmers, through the provision of necessary support systems;
2. to encourage and promote the active participation of farm families, rural cooperatives and the private sector, recognizing them as principal agents in the development of the Philippine dairy industry;
3. to develop and disseminate appropriate smallholder-based dairy technology.

**Section 11. Dairy cooperative and farmers’ organizations** – The Authority [NDA] shall help organize small producers and processors of milk into cooperatives or other forms of organizations to achieve the purposes of this Act, including:

- to facilitate collective arrangements that will enable cooperatives to acquire dairy animals, feeds, veterinary and other supplies, materials, equipment, services of all kinds and other dairy inputs under favourable terms;
- to provide a forum for the members of cooperatives to discuss common problems affecting production, marketing and the cooperatives’ relationships with the Authority;
- to help design credit systems that will provide loans, grants and such services as may be required, to dairy cooperatives and duly accredited people’s organizations;
- to assist cooperatives in developing market channels and in negotiations for bulk outlets of milk output.

**Section 16. Nutrition programmes** – The Government’s nutrition programmes requiring milk and dairy products shall be sourced from small farmers and dairy cooperatives in coordination with the Authority.

The official plans before and after the passage of the law, likewise, supported the development of smallholder dairy as contained in the Medium-Term Dairy Development Plan of 1989–1993 and the Dairy Road Map for 2004–2007. As dairy enterprises progressed over the years, private producer/processors and the cooperative enterprises found ways to work with one another.

**Critical factors influencing dairy development**

**Participation of local government.** Local government engagement has expanded to involve provincial governors and provincial boards, a marked improvement from the time when only village and town or city officials supported dairying efforts. In particular, four provincial governments have become active partners in the installation of dairy zones in their provinces. With ample explanation, provincial governors have agreed to follow the specifications of a dairy zone, foregoing the traditional way of distributing animals to all areas, a practice that resulted in dispersed stocks and non-sustaining enterprises. Under such partnerships, the
provincial government provides land for a processing plant and capital loans for dairy enterprises, sponsors milk feeding programmes and deploys provincial dairy programme staff for services and other forms of assistance.

**Breakthroughs in appropriate technology for long-life milk.** In the absence of guaranteed public or private demand for milk products, milk producers in the Philippines have no guaranteed market. As such, the burden of managing the product mix is on the enterprises at all levels, from farm to retail outlets. In this context, the design and fabrication of a water retort facility made possible the production of long-life sterilized milk in pouches for commercial distribution and for feeding programmes in remote areas. It was a breakthrough in marketing.

The first facility was set up in Davao City, Mindanao, in 2002, a second one followed in Cebu City in the Visayas in 2006 and a third one has been commissioned for installation in Lanao del Norte, also in Mindanao. The Dairy Development Foundation of the Philippines sponsored the feasibility study and initial test runs of the retort facility. Subsequently, the National Dairy Authority funded construction of the first unit, although the dairy federation that operates the plant repaid the expenditure after it was installed. The facility requires a fill-seal machine, which the federation obtained a private loan to buy. The cooperative federations also invested the necessary funds to build the second and third units. Other milk products in stand-up aluminium pouches, including evaporated milk and condensed milk, which are widely consumed items in the Philippine market, are in product development.

**Availability of smaller processing facilities.** With the training of local engineers and fabricators and access to Chinese, Indian, Thai and Taiwanese dairy equipment suppliers, the old practice of commissioning dairy plants on a turn-key basis has been abandoned. In fact, even old plants have been reconfigured to suit the needs of smaller production sites. Some of these are privately financed like the processing plants of two popular brands in the market: Milk Joy and Gatas ng Kalabaw. Other plant-redesign projects were initiated by the Government and covered with lease agreements with cooperative federations. The capability and confidence established in designing appropriate capacities of processing plants have greatly reduced the investment required for plant installation.

**Technical support for milk-quality assurance.** For many years, local industry relied on academia-based technical support. This meant following the prescriptions of the Dairy Training and Research Institute on all aspects of dairying, from farm to plant. While such support was scientifically sound, it was not always grounded on commercial realities. For example, some products that were developed failed to succeed in penetrating commercial markets, sometimes due to poor packaging, untested shelf life or omissions in product costing. The breakthrough for the local dairy industry came sometime in 1997 when a group of technical people from Nestlé and Magnolia (leading food companies in the Philippines), upon their retirement, organized a technical cooperative that made their services available to other cooperatives, including dairy. The technical cooperative established a commercial laboratory to which milk samples were sent for microbiological tests, milk-composition analysis and commercial sterility and shelf-life tests.

The experience with an independent group doing the tests has greatly motivated producers and processors to upgrade quality and to strive for consistency in the quality. With help from the group, other technicians were also trained and deployed as quality-control staff in different processing plants.

**Enterprise orientation and market-oriented financing packages.** Transforming dairy farmers to dairy entrepreneurs has been the theme and pre-occupation of the industry movers, both in Government and the private sector. The transformation process includes training farmers in business skills as well as value-adding in terms of standardized quality testing at the collection centres and the processing plants, assisting in

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50 A water retort facility passes hot water instead of steam, preventing the scorching of milk and greatly minimizing the cooked taste. Designed by the Philippines’ Science and Technology Department, although patterned after some versions made in other countries, it processes sterilized milk in stand-up aluminium pouches. The product has a shelf life of six months or more. It allows dairy processors to produce milk that can be delivered to remote areas in cardboard boxes and stored in ambient temperature. The product has the shelf life of UHT milk in Tetra Pak cartons and the delightful taste of flavoured milk. The equipment is suitable for processing smaller volumes (1 000 litres) of milk in batches, unlike UHT plants that require some 10 000 litres per run.
obtaining product licenses and plant accreditation and enforcing product standards for suppliers in milk-feeding programmes. In this approach, smallholder farmers essentially become smallholder enterprises.

That process was based originally on the recognition of several requisites: the need to break from the traditional reliance on government subsidies and freebies; that cooperatives had to operate on their own capital and to pay for facilities, even if established by the Government; that farmers needed to learn that milk price is determined on both sides of the plant: the farm and the market; and that a farm operation had to run like an enterprise. These requirements continue to permeate all training programmes and financing packages for the industry. One indicator of the effectiveness of that orientation: a farmer who talks about the need to produce at least at break-even volume with three animals and who smiles when the day’s milk exceeds that level.

Financing packages have been negotiated with financing agencies to reflect the dairy production cycle. This entails technicians certifying that an animal is in its dry period and a farmer resuming loan payment upon the animal’s calving. The financing agencies have agreed to not penalize non-payment during the dry period but do expect balloon payments with the sale of male calves.

**Island dairies for local milk supply.** Even Manila-based bureaucrats could not believe that small islands could operate viable dairy enterprises. When dairy zones were established on the islands of Siquijor, Iloilo and Negros Occidental and the enterprises managed to penetrate local markets, it proved credible. Supplying the local urban markets requires appropriate packaging, quality assurance and a distribution system. Local teams were trained to handle these aspects. In the immediate communities of the dairy producers, milk also became affordable to farm workers and households. For example, in Negros Occidental, sugar farm workers can buy farm-pasteurized milk at 20 pesos per litre, which is about one-third the price of milk at a supermarket. Although the processing plant campaigns for the delivery of the maximum volume of milk to the plant, an amount of community sales is tolerated.

**Dairy zones and the clustering of big and small farms.** In previous years, there were strong sentiments on whether support should emphasize big or small farms. The dairy zone model provides a structure for the participation of smallholder farmers. Over time and as dairy cooperatives and their counterpart big farms gained confidence in their capacities, they started to do business with one another. Their transactions demonstrated that they could gain bigger market shares by stabilizing the supply – if those who had more milk made it available to those who did not have enough. In the end, it was good business for big and small farms to collaborate. In the area of credit sales, the processors also soon learned that their outlets that had unpaid accounts with one supplier sometimes merely shifted to another supplier and delayed the payment to the previous supplier. Soon enough, the processors learned that it was not always because they were better that an outlet dropped one supplier in their favour. In transactions with one another, processors learned that customers were simply hopping from one supplier to another.

**Commercial farm module.** When smallholder producers began growing into medium- and bigger-sized farms (of 20–100 animals), the National Dairy Authority started to design commercial farm modules that would suit the emerging crop of dairy farmers. Farm size is a very fluid figure, but there are stages of growth: Farmers first engage in dairy on a part-time basis; then one member of the family goes into it full time, with about three other family members assisting in forage gathering, milking, milk delivery to the collection centre and selling some of the milk to the immediate community.

The NDA’s latest farm count includes 77 private commercial enterprises that are not cooperatives and 38 government stock farms and institutions engaged in dairying. Another indication of the trend towards private endeavours that are not structured as cooperatives is the creation, in Mindanao, of the Mindanao Dairy Alliance, even though there are two dairy cooperative federations operating to accommodate the private enterprises. Some examples of private dairy farms are: the Del Monte dairy in Bukidnon, the farm of the Benedictine monks and farms run by non-government institutions and foundations.

The role of the NDA is critical for ensuring the participation of smallholder dairy farmers in the industry. This is done by supporting the massive upgrading of local animals that eventually provides the cheapest source of dairy stock. Interventions in quality assurance are also a significant contribution by the NDA’s technical staff. Further, in designing loan facilities and enterprise contracts, the NDA can calibrate its levels
of support. In some zones where land is limited, dairy farmers have had to give up their cows by selling or passing them on to relatives with farms in other areas. While that mode of natural dispersal is acceptable, a more structured and organized mode of expansion can be encouraged systematically. It is along this rationale that bigger loan packages and other types of technical support are being designed to enable dairy farm growth. The packages include the loaning of tractors, breeding farm aid and pasture development loans. Financing agencies are also being tapped to open lending windows that will allow larger farms to procure more cows or to invest in other facilities, such as milking parlours and farm cooling equipment.

**Philippine Carabao Center.** The PCC is a world-class research centre for buffalo. Its studies and research on genetic improvement are directed towards making the Philippine carabao a major milk supplier for the country. Today, 36 percent of national milk production comes from carabao, 63 percent from cattle and less than 1 percent from goats. The emphasis on carabao is based on climate suitability and the huge number of animals on the ground that may potentially be upgraded to a dairy buffalo breed. Aside from the research focus, PCC also supports buffalo-based dairy enterprises in various parts of the country. Nueva Ecija province is its main area of intervention, with 13 other centres throughout the country that are connected with local state universities.

**Dairy Training and Research Institute.** With its core staff of dairy specialists, the DTRI continues to be a resource for the industry although its facilities are in need of improvement. Training courses for cooperative-based dairy technicians are conducted in coordination with the DTRI. It also maintains a semen-collection facility that supplies dairy farms in Luzon.

**Official development assistance.** With very limited resources channelled to the smallholder dairy sector, support through official development assistance significantly has accelerated dairy zone expansion in the past six years. Specifically, official development assistance from the US Government’s Section 416(b) facility and the Food for Progress programme has been a significant source of investment in smallholder dairy. In partnerships with the US Department of Agriculture, the National Dairy Authority and the American Land O’Lakes (LOL), local capacity-building has been undertaken in four new dairy zones, with four more in progress. Even a LOL milk feeding programme in one region had a dairy capacity-building component with smallholder farmers. That site now is being scaled up to a dairy zone. Assistance from the FAO for improving milk quality and from the Japanese and Australian Governments for improved milk quality and breeding has provided valuable support to the smallholder dairy sector.

The success of the foreign-funded programmes may be attributed, to a large extent, to the high degree of collaboration achieved between the foreign donor and the local partners. Other foreign-assisted programmes have been installed but did not succeed due, in part, to the lack of recognition of the smallholders’ role in the success of dairying and the desire to go big and establish huge communal farms.

**Smallholder dairy farmers**

The Government’s focus on smallholder dairy farmers has generated the following modes of inclusion:

**A strong dairy enterprise is the most important requisite for smallholder inclusion.** At the present stage of dairy development in the Philippines, the dairy enterprise has taken many forms. The most dominant is the cooperative, of which there are two distinct categories: There are dairy cooperatives with only dairy farmers as members, and there are existing multipurpose or credit cooperatives that have opted to include dairy as one of its business enterprises. Both types can exist within dairy zones, although the first is simpler in terms of management. The advantage of the second type is typically the use of its previous business experience in the dairy business. It has yet to be established which type ultimately allows broader inclusion of smallholder farmers. The organization of dairy farm producers is usually the primary cooperative that operates the collection centre. The primaries are members of a second-tier cooperative, which is the federation. The dairy federation operates the milk processing plant and undertakes marketing operations. The federations in the Philippines are members of the Dairy Confederation of the Philippines, the national organization of dairy cooperatives. The Dairy Confederation is independent of the National Dairy Authority. It is the apex organization of the various dairy federations.
Other forms of dairy enterprise are single proprietorships for which some farmers have opted, such as those growing faster than others. These are typically farmers who have a little more capital to procure stocks rather than waiting for the natural calving of their initial herd. They also own or have access to bigger parcels of land for pasture. The dairy zone profiles (Annex II) shows that in the most developed zone in Laguna-Quezon, there is an equal number of cooperatives and non-cooperative enterprises.

There are also public–private partnerships in dairy enterprises. This has emerged in some instances when the federation is unable to manage a viable business enterprise. This would likely be due to some weakness of the cooperative, such as abuse by members in the management staff, delay in payments to farmers or the inability of the plant to impose quality standards. In earlier years, the National Dairy Authority assumed control of a flailing enterprise in the form of a management contract with the federation. Under that arrangement, the NDA took over operations until problems were straightened out and then it exited. More recently, the public–private equity partnership has been formalized. Under this arrangement, the NDA takes equity in the business, which then becomes open to equity participation by the federation or other private entities.

Collaboration among big and small enterprises, once they have achieved some level of stability, is important for a stronger market presence. Big and small dairy enterprises operating side by side are a phenomenon of recent years. It emerged as a natural recourse for enterprises to take advantage of market opportunities and to address some common problems. Its most dominant form is the collaboration between a processing facility that owns a farm and produces its base milk requirement but also maintains several small groups that supply milk to the plant. This type of collaboration has resulted in dairy producers shifting from one processing facility to another, especially around the Metro Manila area. In general, there exists a healthy competition for the best benefits given to the small producers. The cooperative-run facility, for example, pays regular dividends to members while non-cooperative enterprises do not.

On the other hand, the non-cooperatives usually attract producers by offering higher prices for raw milk. The competition leads to a market-determined price for the milk, which ultimately benefits the small producers. (Of course, there are also instances when the big processors drop small suppliers.) In this case, the members have a better guarantee from their cooperative federation that their produce will be procured.

The money realized from dairying is the single biggest incentive for smallholder dairy producers. As soon as smallholder farmers begin to make money from dairying activity, they are likely to stay with it. In dairy zones where small and big farmers operate, the big farmers who have other options and who can afford other investments are the first to quit while the smallholders continue. This reality justifies focusing interventions in smallholder dairy programmes on enterprise strengthening to ensure the broadest inclusion of small-scale farmers.

Technical assistance along the entire value chain is critical. Production support is important but not enough. Enterprises with broad smallholder participation have succeeded where the technical assistance extends beyond the farms to include quality control, product development, packaging, market positioning and enterprise management. Making these forms of assistance accessible and affordable is a challenge to any support mechanism for smallholders.

Dairy Development Foundation-supported smallholder inclusion. A strategy of inclusion of smallholders requires a deliberate and creative development vehicle that is sensitive to the impact of policies, programmes and activities. Because the smallholders are the most vulnerable, the Dairy Development Foundation of the Philippines (DDF) provided assistance when government support faltered; an outstanding example is when the Government set aside the dairy zone model to pursue the communal farm model. Until its demise in early 2007 (due to lack of funds), the DDF explicitly supported the dairy zone concept, which emphasized the inclusion of smallholders in dairy development. Established in 1992, the DDF assisted in organizing

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51 The Dairy Development Foundation of the Philippines (DDF) was an NGO established purposely to fill the gaps and temper the swings in government support for smallholder dairy farmers. It had a Board of Trustees composed of respected members of society (including a former agriculture secretary, former ambassador and vice president of the Philippines, a bishop, a former senator, a former congressman and others). Funding was sourced from international agencies. However, in early 2007, the DDF stopped operations due to lack of funds. Some former members of the foundation continue to assist in dairy development in a private capacity.
smallholder dairy farmers into the Dairy Confederation of the Philippines. It was only in 2000 that big enterprises were admitted for membership in the Dairy Confederation once they recognized the important role of smallholders. At the present stage in which the robust collaboration of big and small dairy entrepreneurs is deemed important, the DDF facilitated the process by helping configure collaborations, such as public–private partnerships in breeding programmes and market matching.

**Milk-feeding programmes as a kick-starter.** It is critical to manage the product mix so that dairy enterprises do not lose commercial markets when there is a surge of sponsored milk feeding programmes. At the National Dairy Authority, at one point, there was an attempt to keep the ratio of milk that goes to milk feeding to no more than 40 percent. But as public programmes go, there are times when the demand outpaces the planned allotment for school feeding. It appears that the processing plants with the most stable commercial markets keep their commitments to school feeding to a minimum. In areas outside the major cities, dairy enterprises in the start-up stage benefit from school milk programme contracts. This coincides with the desire of local government units to prioritize local farmers to supply milk for local nutrition programmes.

**Indigenous products provide the highest returns.** There are areas in the Philippines that have a tradition of producing buffalo milk and processing it into indigenous milk-based products, such as candies and cheese. For example, different regions are known for particular types of *pastillas*, and the recipe for *keseo* in one region is said to have been handed down from ancestors of 400 years ago. When smallholder dairy farmers engage in indigenous product processing, they realize the highest returns, based simply on the principle that value adding leads to gains. The prospects for expanding their markets that have not yet been maximized, such as the overseas Filipinos who look for *keseo*, even ordering it from abroad.

**Prospects**

The following strategic tactics have been important for the local dairy sector to competitively supply growing markets in the future:

1. **Invest in quality assurance and product development.** This involves investments in facilities, in personnel and in process documentation – all important factors for achieving consistent milk product quality. While these are taken for granted within bigger companies, smallholder-operated enterprises may not have sufficient capital to invest. These areas may be considered as preferred points of intervention for smallholder operations. Fortunately, the dividing line between appropriate development/public support and private sector investment is fairly clear. Enterprises are usually able and ready to hire their in-house quality control person. They would also have their basic testing equipment and a simple laboratory. The setting of product quality standards is certainly the domain of government or development assistance. But the sharing of costs in product development is usually tricky. Without some public support, only the bigger processors can pursue all stages of product development, from production of samples through the testing regimen, product registration, appropriate packaging, filling equipment, etc. For smallholders to have significant benefits from advancing along the value chain, support in these aspects would be appropriate. Assistance in the standardizing of product procedures has been tried with some local funding sources and has worked occasionally (the manual for gouda cheese production is one example.)

2. **Target processing efficiencies by localizing supply and firming up the product mix.** With the high cost of transportation and maintaining a cold chain, the approach to supplying local demand with local production has significant cost advantages. Stabilizing enterprise operations includes managing a product mix that suits a local market and achieves maximum cost efficiencies.

3. **Maximize the parallel and collaborative operation of big and small farms.** Where mutual interest is sufficiently safeguarded, more collaborative transactions could be encouraged. In the Philippines, smallholder producers who are growing faster than others sometimes opt to partner with a big processor in the area. In one case, a big farm in Mindanao has brought many producers together to supply milk in bulk to a processor.
4. **Invest in breeding and herd improvement.** Accelerated expansion can only take place if the supply of stock is assured. In the Philippines, investment in animal procurement and breeding requires infrastructure support, including the reliable supply of liquid nitrogen to all livestock areas. Configuring public–private partnerships for breeding farms has yet to be fully developed. Because of the emphasis on carabao, the Philippine Carabao Center is more advanced in the field of breeding. Nonetheless, upgrading of local cattle is also promoted. Government still provides semen for free, conducts training of artificial insemination technicians and has bull loan programmes for some areas. More recently, the NDA has gone into a public–private arrangement to operate a cattle breeding farm that the NDA owned but managed by a successful dairy farmer who started small and has grown into a farm with 75 milking cows. The Dairy Confederation is also studying the possibility of engaging in breeding-related ventures. The designing of more public–private ventures, with the participation of groups that understand the dynamics of smallholder dairying, will be helpful in ensuring the inclusion of smallholders in these arrangements.

5. **Design suitable financing schemes for dairy animal procurement.** *Palit-baka,* or repayment in kind, has always been the preferred mode of animal procurement for smallholders. It is considered least burdensome and takes away the anxiety over committing to pay regular financial obligations for animals whose performance cannot be predicted accurately. However, the scheme has a low potential for attracting commercial financing because the step of monetizing collection in kind involves other costs. The NDA has developed various financing schemes to make lending for animal procurement more affordable through a cycle that corresponds to the productivity of the dairy animal. The packages have provided more comfortable incentives for early repayment through the sale of bull calves and have implemented sanctions, such as removing animals from negligent farmers. Tapping more suitable financing agencies prepared to administer dairy-oriented loan packages is still in progress.

The following three opportunities would facilitate smallholder dairy farmers in accessing the expanding local dairy markets:

1. **Dairying for agrarian reform communities and families of overseas contract workers.** A number of existing dairy zones are located in agrarian reform communities, including those in Bulacan, Quezon, Negros Occidental, Iloilo and Zamboanga del Norte. Authorities have seen the benefits of dairying on families of agrarian reform beneficiaries. As a result, the Department of Agrarian Reform is currently considering introducing dairying in suitable areas among the 1 500 agrarian-reform communities throughout the country. This initiative could potentially accelerate the participation of more smallholders. Likewise, overseas contract workers looking for investment opportunities have considered dairying as an option for their families in their home villages. Contract workers whose families live along milk-collection routes have been among the early start-ups, due to ease of entry. A dairy enterprise also offers a scheme in which a contract worker invests in dairy animals; the company offers to take care of the animals and buy all the milk produced by the animal. The boarding fee of the animal is deducted from milk proceeds while the investor’s share is deposited in his/her bank account. The investor receives a regular report on the milk produced by the animal and an occasional photo of the farmer-caretaker and the dairy animal. Both prospects require sound implementing plans and effective monitoring to deter unscrupulous parties from taking advantage of new players.

2. **Mainstreaming of widely consumed dairy products, such as evaporated and condensed milk, and other products.** With the facilities available currently, dairy enterprises already are capable of producing popular dairy products, such as evaporated and condensed milk. Some support could be used for product development for more competitive pricing. This could be done even as other products are continually introduced, particularly yogurt and cheese. The growing interest in consuming local products always includes dairy products that seem to symbolize modern agriculture in some rural areas.

3. **Institutionalized local government-sponsored milk feeding for day-care centres and schools.** Smallholder dairy producers in the Philippines do not enjoy the security that all milk produced will be procured by a central milk-buying station backed by a nationally legislated milk procurement fund. Instead, some milk feeding programmes (either nationally or locally sponsored) have yet to be
institutionalized so that they can be more predictable and less affected by policy swings. One recent example is when the Government switched to rice distribution as a school feeding programme instead of milk. In a few municipalities and provinces, the school milk programme has been embodied in local ordinance, which makes it more permanent. In most areas, however, farmers and their cooperatives have to make appeals every year to continue supplying milk for the programme. When big companies donate milk powder to local governments or offer rock-bottom prices, the local suppliers are sometimes dropped. Although the law, the National Dairy Development Act, provides that government-sponsored nutrition programmes shall be supplied by local producers, its implementation has yet to be strictly followed.

The following suggests approaches for focused, actionable, national and regional dairy strategies:

1. **Propose livestock and dairy as a major poverty-reduction strategy and prepare the necessary supporting documentation.** While livestock support and dairying development as pro-poor strategies are found in existing FAO programmes, there is room to more effectively capture the imagination and support of policy-makers and development practitioners. Specifically for the Philippines, the good socio-economic impact of livestock and dairy programmes in other countries can serve as stimulus for a more systematic promotion of smallholder livestock and dairying programmes. For decision-makers, more comprehensive research and documentation would be required, particularly those that undertake comparative impact studies among various poverty-reduction options, such as comparing pure crop and crop-livestock programmes or the distributive impact of smallholder farmers supplying nutrition programmes.

2. **Transform the lessons-learned studies into programme templates.** This would include models for installing dairy capacity, dairy financing packages, breeding farm modules, milk quality-based pricing systems and dairy plant-management fundamentals. Making these available to regional industry players and assist in adapting the templates to local settings should include grassroots-level exchanges among successful smallholder dairy producers and enterprise managers. This could include a programme to identify one or two successful smallholder-based dairy enterprises in each country and conduct on-site training for two or three participants, covering various aspects of enterprise operations allowing for maximum discussion of comparative methods or approaches. The course can be configured so that every training day starts with actual observation of the process to be studied: quality control at farm and plant to include milk tests, temperature control and clean in-place procedures or milk allocation to various products or deliveries for school milk feeding. Such a programme could stimulate greater systematization among participating processing plants and farms.

**Conclusions**

Smallholder dairy farmers’ enterprises participating in the Philippines’ local dairy sector have hurdled the test of enterprise viability. While profit levels are modest, the sustained operations of these enterprises ensure that producers’ milk are collected and paid for. Operating on their own resources, paying rent for facilities to the local government and paying farmers regularly for raw milk are the minimum indicators of enterprise viability.

It was not an easy task, considering that the dominant thinking of the Government and business has been that smallholder dairying cannot work. In fact, some individuals still think this way. However, there are enough successful enterprises run by individual smallholder dairy farmers, primary cooperatives and cooperative federations to prove that the broad-based model of clustered producers can take advantage of distinct economies of scale using farm labour and marginal lands. The cost efficiencies will continue to be a subject of closer scrutiny, but the staying power shown by smallholder dairy producers and their enterprises is traced to the single, most powerful incentive: profitability. Many more have not crossed the finish line, but those who have achieved sustainability serve as models for what is possible.

An interesting window of opportunity is the clustering of big and small farm enterprises. In particular, some of the bigger ones are farms that started small and have achieved a bigger scale of operation over time. These collaborative ventures of small and bigger dairy entrepreneurs as well as public–private ventures are accelerating and opening new opportunities for all players.
The entry of NGOs and foundations is also interesting because they provide greater attention to the social preparation of smallholders, which is often overlooked by government-initiated projects that tend to focus on the technical aspects.

Overall, smallholder dairy enterprises in the Philippines can run on their own resources and are realizing comparatively satisfactory returns. There will always be attempts to “fast track” and downplay the role of smallholders, but the history of dairying in the Philippines has produced enough lessons to validate their significance to the local dairy industry.

**Box 1: Key definitions**

**Smallholder dairy farmer:** Someone with one to three dairy animals, often not belonging to an organized milk-collection system.

**Smallholder milk producer:** Someone who may start with one to three dairy animals but with a perspective of growing the herd to 5–20 head. This producer belongs to a village association or primary producers’ cooperative that undertakes the pooling of milk through a collection system. In the field, the distinction between smallholder dairy farmer and smallholder milk producer is negligible.

**Formal markets:** The dairy federation that operates the processing facility in a dairy zone that usually buys the milk from the primary cooperatives. It also refers to commercial dairy farms that own a farm and processing facility but also buy raw milk from other milk producers. The formal market includes the final consumers of the milk products, including the institutional buyers (supermarkets, hotels, restaurants, coffee shops) and the final consumers.

**Informal markets:** Milk sellers and buyers in a neighbourhood or village. It includes smallholder dairy farmers and smallholder milk producers who sell some of the farm produce to the local market.

**Dairy value chain:** The various stages through which milk and milk products pass from farm to the final consumer.

**Dairy zone:** Consists of 100 farmers with 300 dairy animals located in adjacent villages served by a processing plant located within a 30-km radius of an urban centre and capable of absorbing at least 300–500 litres of milk per day.
Annex I: Description of a Philippine dairy development model

The dairy development model, evolving from the vision presented in the Medium-Term Dairy Development Plan (1989–1993), consists of three main parts: a broad foundation, a basic structure or module, and infrastructure support, as the following explains:

**Foundation: Massive backyard dairying**

- This component proceeds from the basic inventory of animals as of 1988: 2.788 million carabao, 1.634 million cattle and 2.046 million goats. Laying the foundation for an indigenous, smallholder-based dairy industry requires the milking of all milkable animals on the ground.
- Animal infusion at this level is very minimal and will be left, primarily, to local initiatives that may include projects of NGOs, of the Dairy Authority’s local offices, the Philippine Coconut Authority in coconut areas, the Department of Agrarian Reform in agrarian reform areas, etc.
- A proposed National Milk Campaign shall include the promotion of this component.

A structural support could be established through the creation of community livestock management units in barangays (smallest administrative unit) with experience in organized activities. Such a unit could handle inventory-taking, planning of breeding schemes, forage improvement, complementary dairying and fattening schemes.

1. The NDA’s network of technicians shall be the main agents for promoting the National Milk Campaign. This will entail matching the suitable dairy areas with trained dairy technicians.
2. Dairy farmers’ training will be a major activity at this level to include the training of paraveterinarians and community dairy officers as well as training in indigenous feed sourcing, home-based or community-based dairy processing and others.
3. This stage shall be primarily focused on improving rural nutrition. Any marketing activity at this level will be limited to the producers’ communities.
4. From this level may emerge potential dairy zones.

**Basic structure: Network of dairy modules**

- The dairy module shall have four basic components: a dairy market base, a production unit, a collection system and a processing facility.
- Dairy market base. The dairy module, from inception, shall be market oriented. As such, the following elements shall be present at the prospective module site:
  - a city centre and 5–6 contiguous municipalities as target market;
  - an assured market for a daily base volume of 300 litres and the capability to develop a dealer network to absorb 500–700 litres and to supply 200 litres to a dairy facility outside the module;
  - a market for 700 litres daily translates to about 2 800 households in the prospective site, with at least four household members consuming a glass of milk (250 ml) each about twice a week;
  - the market shall be located within a 35-km radius of the processing facility;
  - one insulated delivery vehicle and a telephone are basic requirements of the marketing unit.

- Production unit. The dairy module’s production unit shall consist of:
  - a herd of 300 dairy animals owned by 100 dairy farmers;
  - with at least two pregnant animals in each three-cow herd;
  - located in four clusters of 25 members and 75 animals each;
  - each cluster located within two adjacent barangays;
  - each cluster accessible to a four-wheeled vehicle;
  - each dairy farmer should supply at least 100 kg of grass per day, which requires access to an aggregate area of 3 000 sq m of grassland each month for cut-and-carry feeding;
  - each farmer should have access to an adequate supply of water to provide at least 111 litres of water each day for three animals.
• The technical support for the dairy module shall include:
  ○ Breeding services: free semen, AI equipment and services for five years;
  ○ Animal health services: free veterinary and paraveterinary services, free hemosept and foot-and-mouth vaccines and available drugs for emergencies, to be sold to farmers at cost; technical assistance provided for preparation of silage.

• The dairy module requires the infusion of dairy animals to the unit. However, the dispersal scheme and credit design have yet to be drawn. Some concepts suggested so far are:
  ○ A government animal loan fund, deposited with the bank; farmers can borrow from that fund; the bank evaluates each applying farmer’s qualifications; the bank receives repayment of the loan.
  ○ A cooperative undertakes the preparation of production module, including preparing the readiness of farmer participants; the cooperative borrows from a bank; the cooperative administers the individual farmer loans; the bank collects from the cooperative; cooperative collects from farmers though deductions from milk sales. (This concept is highly recommended by the dairy committee.)
  ○ A cooperative production unit is required to have counterpart animals to qualify, say, 100 head (this may be put together from animals on the ground, from small grants or from local projects). The National Dairy Authority provides an equal number of dairy animals; farmers repay with one female yearling, which is dispersed to new dairy farmers. This scheme involves no loan fund and no loan amortization.

• Collection system. The smallholder-based production unit requires a systematic collection system, which should have the following elements:
  ○ milk tanks identified with every farmer or group of farmers who supply the raw milk;
  ○ collection station designed for each cluster;
  ○ testing capability at the collection station, preferably by a cooperative’s quality control officer;
  ○ collection vehicle/s controlled by the cooperative (vehicles may have to be leased from the government initially).

Processing facility. The processing plant is the centre of the module. This will consist of a pasteurizer and homogenizer with a capacity of 200 litres per hour or less (this is the smallest capacity available currently). The plant will also have to be leased from the Government by the cooperative. In addition, assistance in plant operations and product quality control will be needed by the cooperatives. This assistance may be provided by the Government for not more than two years for each dairy unit.

Infrastructure: Support network

Establishment of a cooperative-based industry in dairy requires a support network that corresponds to the structure of the modules. This will include the following:

• The National Dairy Authority which will uphold the industry rationale at all phases of development support.
• Production support will consist of the maintenance of a breeding centre and stock farm to handle animal movement and breed upgrading.
• Processing support will consist of providing a second-level processing of surplus milk, either by setting up facilities for cheese making, UHT processing or spray drying that could eventually be run by more advanced cooperatives or by requiring commercial processors to absorb the excess milk production; this includes product development, which the dairy modules cannot realistically be expected to undertake.
• Further integration would include support for fabrication of cheese pressers, filling machines, churners and other processing equipment and for the development of improved but affordable packaging materials.
• Market support shall include the identifying of markets to absorb the base volume of 300 litres per dairy unit per day and the brokering for institutional markets for the dairy units.

• Dairy training and research should be anchored on the needs of dairy units, particularly in herd and breed improvement, indigenous feed sourcing, animal care, quality control, product improvement and others. Training should include direct farmer education. Even training in other countries should consider farmer-technician trainees rather than government technicians only.
Annex II: Profile of dairy development zones in the Philippines

<table>
<thead>
<tr>
<th>Dairy zones</th>
<th>Dairy animals</th>
<th>Milk production (in '000 litres)</th>
<th>Annual sales (in '000 pesos)</th>
<th>Dairy farmers</th>
<th>Primary coops</th>
<th>Govt &amp; private farms</th>
<th>Children in feeding programs</th>
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Source: The Bureau of Agriculture Statistics
Annex III: Milk price chart (pesos/litre)

Rural dairy farmer – coop member
16–20 pesos ($0.35–$0.43)

Collection centre – primary coop.
18–20 pesos ($0.39–$0.43)

Village retailer
20–25 pesos ($0.43–$0.54)

Processor
35–40 pesos ($0.76–$0.87)

Institutional outlet/milk dealer
40–45 pesos ($0.87–$0.98)

Rural consumer
23–30 pesos ($0.50–$0.65)

Urban consumer
55–85 pesos ($1.20–$1.85)

Urban consumer
56.50–62.50 pesos ($1.1–$1.22)

Milk importer
UHT milk
37 pesos ($0.72)
Annex IV: Milk flow chart (12.87m litres)

Note: *Total volume of 5.08 million litres sold to federations are from private farms; 53 percent, or 0.68 million litres, and cooperative–CVCC 51 percent, or 4.4 million litres. The percentages in the given indicators are based on the NDA-assisted /monitored projects (indicative), but the total production of 12.87 million litres is based on national figures.

('000 million tonnes or million litres, in liquid milk equivalent)

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Source: The Bureau of Agriculture Statistics
### Annex VI: A profile of dairy farm types,\(^\text{52}\) as of July 2002

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<tr>
<th>Animal/farm type</th>
<th>Dairy farmers by animal inventory</th>
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<td>-</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Government owned/SCUs</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Private institutions/NGOs</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>-</td>
<td>-</td>
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<td>6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4 194</td>
<td>564</td>
<td>60</td>
<td>100</td>
<td>18</td>
<td>21</td>
<td></td>
<td>4 957</td>
</tr>
</tbody>
</table>

Source: The Bureau of Agriculture Statistics

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\(^{52}\) Based on Bureau of Statistics Survey conducted in July 2002. Since the last survey, private farms have increased due to the entry of new players and the natural expansion of smaller farms.
Thailand: An industry shaped by government support

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Background

India immigrants introduced dairy farming to Thailand around 1910. For much of the first half of the century, farming operations remained scattered near the Bangkok urban centre. Milk yields per dairy buffalo or cow were low, at 2–3 kg per day. Commercial operations, including milk processing, became only significant after a royal visit of the King and the Queen of Thailand to Denmark in 1960. Consequently, cooperative regulations were enacted and, with assistance from the Government of Denmark, a dairy farm cooperative project was launched in Saraburi province. The Dutch Government also participated in the effort, providing a grant of 23.5 million baht and a technical supervisor.

The Thai-Danish Dairy Farm was inaugurated and began operating on 17 January 1962 (later designated as National Dairy Cow Day). In 1971, the Thai-Danish Dairy Farm was handed over to the Ministry of Agriculture and Cooperatives (MOAC) and became a state enterprise called the Dairy Promotion Organization of Thailand (DPO). The DPO operated then as now with four objectives: i) train farmers on dairy farming techniques, feed management and diseases of dairy animals; ii) develop and produce cross-breed dairy cows suitable for the Thai environment; iii) produce dairy products from raw milk; and iv) promote greater milk consumption in Thailand.

The Department of Livestock Development (DLD) had also launched many projects to promote dairy farming. These included the establishment, in 1957, of two artificial insemination (AI) centres: one in Huay Kaew, Chiang Mai province, and the other in Potharam district, Ratchburi province. Breeding stock from pure-bred Holstein-Friesian and Brown Swiss were used for the artificial insemination. The United States Government provided the Brown Swiss dairy sires for the project.

By the end of the 1960s, government support to the sector resulted in over-supply problems. A group of farmers petitioned the King in 1969 for help. In response, a trial milk powder production plant was initiated on the premise of the King’s palace (Chitralada Villa, Dusit Palace) in Bangkok. Following that experiment, various authorities were invited for discussions on establishing a milk powder factory at Nongpho Dairy Cooperative in Potharam district, Ratchburi province (currently not operational). And so began the first dairy cooperative scheme.

In 1970, Parliament member from Ratchaburi province bestowed 50 rais (around 8 ha) of land at Nongpho subdistrict, along with 1 million baht, for the construction of a milk powder plant. A project committee was established, with the King providing more than 1 million baht to the project. During construction, the farmer leaders in Nongpho and nearby areas requested help from another Parliament member in securing buyers for their raw milk. Kasetsart University agreed to be the main purchaser. The farmers then organized together and formed the Nongpho Milk Centre in August 1970. They obtained additional funding from a government support budget and from among themselves. Eight months later, 185 members of the Nongpho Milk Center joined together to register as a cooperative under the name Nongpho Ratchaburi Dairy Cooperative Ltd (under His Majesty’s Patronage). Currently, the Nongpho Cooperative is the biggest dairy cooperative in the country, receiving about 200 tonnes of raw milk per day from 4 569 member farmers. The cooperative can produce pasteurized and UHT milk and supply products countrywide. It has production capacity to handle the amount of raw milk produced by the farmers in Nongpho and nearby areas.

Periodically during the 1960s and the 1980s, the quantity of locally produced raw milk was low and government policies looked to promote dairy husbandry. The National Milk Drinking Campaign Board (NMDCB) was established in 1985. The NMDCB’s efforts successfully boosted milk consumption and dairy husbandry. In 1987, dairy farms began to boom in many provinces, such as Srakaew, Petchaburi, Prachuab-
Kirikan, Pattalung, Udonthani, Khon Kaen and Mahasarakam. A number of dairy cooperatives followed, set up as milk collecting centres to deliver raw milk to the processors. These successes contributed to socio-economic improvements in the rural areas, bringing dairy farmers a regular income and reducing the migration of workers to cities.

Dairy promotion in Thailand runs parallel with the establishment of dairy cooperatives (since 1971 with the registration of the first one). Currently (end 2007), there are 97 cooperatives. Six cooperatives recently shut down because they were too small and had a very low capacity to manage their raw milk. Sixteen cooperatives have their own processing plant; the biggest is the Nongpho Ratchaburi Dairy Cooperative.

The FAO implemented a two-year training programme for the small-scale dairy sector, from September 2002 to October 2004, in cooperation with the Department of Livestock Development. The project’s objectives were to develop short training courses for dairy farmers and milk-processing personnel. The courses, organized at the Dairy Training Centre in Chiang Mai province, focused on milk collection techniques, milk processing, marketing and quality control.

The training project addressed a lingering problem with milk quality among dairy farmers. At that time, consumers in the rural communities lacked trust in the quality of locally produced milk. Hygienic milk processing needs modern machines and other equipment that are too costly for small-scale processing units or cooperatives. Aware of these constraints, the FAO project looked to provide appropriate technology for small-scale producers with which they could produce safe and hygienic milk products with low investment. The small-scale processing units would then become the primary providers of safe milk to consumers in the rural communities.

The Bann Patung Huaymor Cooperative was selected to be the pilot site. The cooperative now produces ice cream and drinking yoghurt – in response to the diverse demand of consumers. The milk products are well accepted in terms of price and quality. The Dairy Training Centre continues offering three training courses per year, accommodating 20 participants per course. And the DLD continues to provide technical support on milk hygiene and other quality issues.

Milk powder and cheese imports have increased significantly over the past decade, both in terms of quantity and value, and continue to be a huge drain on foreign exchange (Annex III). Milk powder imports are governed by the recent Free Trade Agreements (FTAs) with Australia (January 2005) and New Zealand (July 2005). These are described in more detail in Annex III. Milk powder imports declined in volume substantially in 2007, but values were much higher, reflecting both the shortages and higher global prices.

Due to relatively high producer prices (US$.50 per kg) in the past, it has not been economical to produce milk powder in Thailand. However, the economics are now changing due to the higher price of imported milk powder (currently equal to $.50–$.60 per kg of milk equivalent) and Thailand may reconsider the possibility of investing in milk powder production infrastructure, notwithstanding the current FTAs.

More recent programmes supporting dairy development

Between 1994 and 1996, the Thai Government implemented two projects to promote milk production. The projects aimed to help rice farmers as well as cassava farmers who faced low farmgate price problems by switching their crops to grass for cows. The following describes the seven primary activities of the recent support for dairy development:

1. Successful dairy farms were selected to be demonstration farms under a Government dairy promotion programme. Mobile training units were set up to provide information on technology and techniques, such as artificial insemination, disease control and feed management. The projects succeeded, again to a problematic level – dairy husbandry began to boom in various parts of Ratchburi and Nakorn Pathom provinces, resulting in another period of over-production of raw fresh milk. Most of the dairy farmers were smallholders, owning three to five cows. Under the programme (1994–1996), farmers received five pregnant cows. These farmers then formed milk-collecting cooperatives or centres and delivered milk to
processing plants. To construct a collection centre, they took a loan from the Bank of Agricultural and Agricultural Cooperatives.

The dairy cooperatives provide members with training, technical advice on artificial insemination, dairy farming tools and equipment. Some cooperatives have started other operations as well, such as a feed mill to supply low-price feed to members. The Department of Livestock Development (DLD), the Cooperatives Promotion Department (CPD) and the Dairy Promotion Organization of Thailand (DPO), along with private companies in the milk processing industry, also assist in milk production technology, farm management and milk processing facilities; for example, Nestlé Thailand supported its raw milk suppliers and cooperatives to produce raw milk free from antibiotic and antimicrobial drugs.

The improvement of feeds, roughage and concentrates as well as farm management and health care have played important roles in developing the Thai dairy sector, improving the milk yield from 6–7 kg per cow per day in 1992 to 10–15 kg per day in 2006. Meanwhile, the average dairy herd per farm expanded to 18–22 animals, including milking cows heifers and calves (smallholder = fewer than 10 cows, medium scale = 11–20 cows and the large own more than 20 cows).

2. The introduction of Holstein-Friesian cross-breeds, which are well adapted to local conditions, also helped develop the dairy sector through the continued government support for dairy breeding programmes. Thai Holstein breed development was initiated in 1969 under a Thai-Netherlands Project, with AI recording, milk recording, progeny testing and semen production established at the Pathum Thani AI Research Centre, which was set up by the DLD and the Bureau of Biotechnology in Livestock Production (BBLP). The project was designed to develop a 75 percent Holstein-Friesian dairy cross-bred population through selection and breeding in the open herd system (under field conditions).

As farmers gained experience, the breeding plan shifted from 75 percent Holstein-Friesian to 87.5 percent Holstein-Friesian crosses. The increase sought to exploit more additive genes for milk production from the Holstein-Friesian, using more advanced technology of quantitative genetics through a sire evaluation system. A genetic evaluation is routinely conducted annually now. Sire summary is released every year in September and distributed to the involved organizations, such as AI units, AI research centres and dairy cooperatives.

Thai milking Zebu and Thai Friesian were also developed and tested by the DLD’s Animal Breeding Division under favourable conditions on government farms. The Thai milking Zebu are a cross-bred between the Holstein-Friesian and Zebu cattle, particularly American Brahman. The Thai milking Zebu development aimed to maintain the Holstein-Friesian blood at 75 percent. The Thai Friesian is an upgraded breed, with more than 87.5 percent Holstein-Friesian blood. Both the Thai milking Zebu and the Thai Friesian projects remain ongoing.

3. The Government’s Milk Board began sets the pricing policy for milk. Other responsibilities include administration of the pricing policy, managing the country’s school milk programme and importing milk powder for the school milk programme. The President of the Milk Board is the Permanent Secretary of Agriculture and Cooperatives Ministry and the Director of the DPO is its Secretary.

4. Interlinked with the NMDCB’s efforts to promote milk drinking for health, Thailand’s Seventh National Economic and Social Development Plan (1992–1996), which targeted malnutrition in children among many issues, sought to encourage milk drinking among school children. In 1992, the Government allocated 278.6 million baht to the Ministry of Education for a school milk programme to provide milk for pre-primary school children and later extended it to primary school children. Currently, some 7 million baht is budgeted to provide milk to more than 6 million school children over the course of 230 days in a year.

53 Members of the Milk Board represent officials from the Ministries of Commerce, Interior, Industry, Education, Public Health, Agriculture and Cooperatives. In addition, there are representatives from the Dairy Cooperatives Federation of Thailand, the Thai Holstein-Friesian Association, the Skimmed Milk Powder Processing Association, the Thai Dairy Industry Association and the Pasteurized Milk Producers Association.
The importance of the school milk programme is two-fold. First, it is creating a milk-consumption habit among a younger Thai generation – the school milk programme has played an important role in the increase of per capita dairy consumption in Thailand over the past decade. Second, processors supplying the school milk programme are only allowed to use local raw milk to produce pasteurized and UHT milk. Thus, the programme is an essential outlet for local raw milk, absorbing a volume of 275,000 tonnes per year, or more than 30 percent of local milk production, according to official government figures.

The milk that children drink at school is largely from local milk – not recombined skimmed milk powder. Thus, the school milk programme is the largest consumer of local milk, buying about one-third of the local production. The government policy emphasizes daily milk consumption among school children up to age 14 years to promote good health and decrease malnutrition.

In 1992, the Government provided its first allocation for the school milk programme, with two primary goals:
- school children to drink 200 cc milk per day (for 200–230 school days in a year);
- the growth rate for these targeted children should exceed 80 percent.

In 1993, the Government increased the school milk budget to 4 million baht and thereafter the budget was increased to cover all pre-primary and primary school children. Each child receives at least 200 ml of milk per day throughout their school days (200 days in one academic year). In 2008, the annual budget of 7,000 million baht ($205 million) was allocated to cover 6 million school children. The distribution of milk for school children is now under the jurisdiction of local administrations throughout the country. The Provincial Administrative Organization and Community Development, under the Ministry of the Interior, and the Office of the Basic Education Commission, under the Ministry of Education, oversee the programme. The milk is distributed in pasteurized sachets for most schools and in UHT packages in remote areas.

The Government sets the school milk price and provides 5 baht per student per day. Currently, the school milk is produced by:
- large cooperatives: 157 tonnes per day (13.08 percent);
- small cooperatives: 105 tonnes per day (8.75 percent);
- private dairy factories: 938 tonnes per day (78.17 percent).

5. During its dairy promotion programme (1994–1996), the Thai Government worked with financial institutions to make loans and credit available to producers for farming inputs, such as housing and buying milking cows. The programme offered capital of 200,000–250,000 baht ($5,000–$6,500) to a farmer willing to raise five cows. The farmer received the loan from the Bank of Agricultural and Agricultural Cooperatives at a 5 percent interest rate. Between 1994 and 1996, some 3,873 farmers received loans to purchase 19,365 cows. The Cooperative Development Fund currently offers loans to dairy cooperatives for development and business expansion.

6. The Department of Livestock Development, the Cooperatives Promotion Department and the Dairy Promotion Organization of Thailand and other educational institutes have remained the primary agencies concerned with dairy research and development (R&D), primarily in the following areas:
- breeding development (to study and select cross-breed animals that produce good milk and are well adapted to local conditions);
- artificial insemination;
- animal feeding;
- animal health management;
- cooperative management;
- farm management;
- dairy processing technology.
7. In addition, **many agencies and organizations are involved in development of the dairy industry:**

- Dairy Cooperatives Federation of Thailand Ltd, an organization that coordinates dairy cooperatives and their members as well as promoting cooperation among cooperatives;
- Thai Holstein-Friesian Association, which provides information on Holstein-Friesian varieties to dairy farmers;
- Skimmed Milk Powder Processing Association, which was established by private sector companies to promote cooperation among skimmed milk dairy processors;
- Thai Dairy Industry Association, which was established by private dairy companies that use milk powder in their dairy products;
- Pasteurized Milk Producer Association, which was established by local milk producers who use locally produced milk for processing pasteurized milk;
- Thai Dairy Board, established by the Thai Government for issuing policies and coordinating all government dairy committees and private associations.

**The current dairy situation**

The total amount of raw milk production in 2007 was 770,000 tonnes. About 95–97 percent of this production was processed for drinking milk. The remaining 3–5 percent was processed for cheese. Thailand also imports other milk products, especially milk powder, which in 2006 was valued at 7.961 million baht ($230 million) for a volume of 95,053 tonnes (2.426 million baht for whole milk powder and 5.535 baht for skimmed milk powder). Thailand also exports milk products, such as sweetened condensed milk, sterilized drinking milk and evaporated milk, to Cambodia, Indonesia, Philippines, Malaysia, Myanmar and other neighbouring countries.

In 2007, there was a total dairy cow population of 297,135. This is a decline from 310,085 cows and 888,220 tonnes of milk in 2005. There are currently 91 dairy cooperatives. The decline over the two-year period (at a rate of 2.1 percent per year of cows and 6.8 percent per year in milk production) has mostly affected smallholder farms. The decline began with the rising price of gasoline, at more than 100 percent over the past three years, which directly and indirectly increased the costs of production by affecting the price of feed, labour and operation costs. Directly, farmers who do not grow forage crop but harvest grass from public places or collect agricultural by-products, such as corn stover, sugarcane tops and straw for dairy feeding, are experiencing higher transportation costs. Likewise, the transportation costs for delivering raw milk from farms to cooperatives and/or to milk processing factories have increased. The increases have affected the profit margins for both the smallholder farmers and the small dairy cooperatives.

The decrease in animal numbers and production may also be linked to an agreement that Thailand signed in 1983 in a World Trade Organization scheme requiring local producers of ready-to-drink milk to use at least 50 percent of local raw milk. The policy helped promote dairy farming in Thailand and boosted farmers’ revenues. But the regulation was lifted in 2004 because milk processors were using more imported powder milk, which was cheaper than the raw milk locally produced.

As a result, some farmers have been unable to remain in dairy farming. Although there are many dairy farms scattered around the country, most farms are located in provinces of the central, northeastern and northern regions (Lopburi, Saraburi, Ratchaburi, Nakorn Pathom, Srakaew, Nakorn Ratchasima and Chiang Mai). To respond to the changing profitability of dairy farming, in 2008 the Dairy Cooperatives Federation of Thailand requested the Milk Board (within the Ministry of Agriculture and Cooperatives) to raise the raw milk price (at the processing plant) from 12.50 baht to 14.50 baht per kg ($0.37 to $0.43) in recognition of the rising costs of production. In April 2007, the Milk Board increased the price to 13.75 baht per kg. Five months later, it issued a second adjustment, raising the fixed price to 14.50 baht per kg.

**Prospects**

Over the past 20 years, the Thai dairy sector has been supported and promoted by the Thai Government. As a result, dairy farms have been well dispersed into rural areas around the country. However, the increased
gasoline prices of over 100 percent during the past three years have forced some smallholder dairy farmers and cooperatives to either scale down or close operations altogether.

Mainly, farmers and cooperatives sell their products to the big processing plants located in the central region, such as CP-Meiji, Foremost, Thai Dairy Industry, Nestlé and DPO. In the North and the South, there are only small-scale plants with a low capacity for processing. Milk products from these areas have to be transported to distant plants, with a higher cost of transportation and risk of spoiling the milk. In addition, the cost of milk production is increasing dramatically because of the higher labour and feed costs.

It is necessary to support the dairy industry by increasing production efficiency at the farm and cooperative levels and by encouraging R&D for new milk products – supporting processing technology as well as research in the marketing of dairy products.

The following strategies are recommended for further developing the dairy sector in Thailand:

- increase the production potential at the farm and cooperative levels;
- develop simple but efficient methods and formats for farmers to compile and record information on their farm activities and promote the advantages of good record-keeping to encourage farmers; the farm records are essential for farmers to analyse the costs of their inputs versus expenditures, which is an important element to improve farm efficiency;
- research the breeding line of dairy cows (to find those best adapted to local conditions and yet still produce high yields);
- research the optimal size of farm (land area and number of animals) to maximize farmers’ resources;
- strengthen the cooperatives; most of the small dairy cooperatives scope their activity in collecting milk from the members, quality control and delivering raw milk to the processing plant. Some cooperatives have their own plants (currently there are 16), but they process only drinking milk. These cooperatives have experienced occasional “market fluctuations”, such as surpluses or inadequate supplies of raw milk. Marketing is another problem that challenges cooperatives. Dairy cooperative managers need to be trained on how to develop proper plans to reduce risks, with a focus on processing for local markets and using low-cost technology. They should also encourage local consumers to drink more milk that is locally produced and thus lower priced than from the big producers;
- develop innovative dairy products and marketing; product technologies for processing various dairy products are mainly “imported” or introduced from abroad and are expensive or require expensive equipment. The Government and relevant dairy agencies and organizations should strongly promote R&D on cheaper technologies (using simple and cheaper equipment) for dairy products for both the domestic and export markets;
- research and develop “local lines or strains” of culture for many products, such as yoghurt and cheese, that need a “starter culture”, which have to be imported and thus are expensive;
- strengthen training centres for dairy production technology and processing to be fully functional and able to conduct R&D on product technology, marketing and training in all aspects related to dairy;
- introduce mobile units to assess farm efficiency from the farm records and thus further improve and support production;
- research and develop simpler and cheaper dairy processing equipment for small-scale plants.
Table 1: Number of dairy cattle and raw milk yields, 1992–2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Cows in milk (head)</th>
<th>Dairy cows (head)</th>
<th>Raw milk (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>121 279</td>
<td>222 499</td>
<td>227 784</td>
</tr>
<tr>
<td>1993</td>
<td>121 190</td>
<td>237 188</td>
<td>293 255</td>
</tr>
<tr>
<td>1994</td>
<td>139 425</td>
<td>265 776</td>
<td>326 381</td>
</tr>
<tr>
<td>1995</td>
<td>167 187</td>
<td>287 247</td>
<td>350 196</td>
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<tr>
<td>1996</td>
<td>162 706</td>
<td>276 345</td>
<td>380 622</td>
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<td>1997</td>
<td>171 238</td>
<td>288 240</td>
<td>385 477</td>
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<td>1998</td>
<td>179 366</td>
<td>335 689</td>
<td>437 116</td>
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</tr>
<tr>
<td>2000</td>
<td>194 003</td>
<td>361 632</td>
<td>520 115</td>
</tr>
<tr>
<td>2001</td>
<td>199 417</td>
<td>373 567</td>
<td>587 700</td>
</tr>
<tr>
<td>2002</td>
<td>207 444</td>
<td>386 645</td>
<td>660 297</td>
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<tr>
<td>2003</td>
<td>265 827</td>
<td>441 487</td>
<td>731 923</td>
</tr>
<tr>
<td>2004</td>
<td>296 472</td>
<td>492 856</td>
<td>842 611</td>
</tr>
<tr>
<td>2005</td>
<td>310 085</td>
<td>517 995</td>
<td>888 220</td>
</tr>
<tr>
<td>2006</td>
<td>299 473</td>
<td>501 464</td>
<td>775 976</td>
</tr>
<tr>
<td>2007*</td>
<td>297 135</td>
<td>500 335</td>
<td>770 000</td>
</tr>
</tbody>
</table>

Note: * is the 2007 forecast
Annex 1: Volumes of local raw milk and imported skim milk powder used in Thai dairy products.

- Farmers producing raw milk
  - 59 private milk collecting centers
  - 91 cooperatives’ milk collecting centers
    - Dairy processing plants (95% raw milk used)
    - Cheese processing plants (5% raw milk used)
      - Pasteurized, UHT and sterilized milk, yogurt, drinking yogurt
        - Pasteurized and UHT school milk (35% local raw milk used)
          - Pasteurized, UHT and sterilized milk, yogurt, drinking yogurt (60% raw milk used)
  - Imported skim milk powder
    - 32% used in condensed milk
    - 42% used in infant milk, snack, ice-cream and other drinking products (which have skim milk powder as ingredient)
    - 25% imported skim milk powder used in
Annex II: Milk price chart

Dairy farmers → Collecting milk centres (13–13.50 baht/kg) → Processing plants (14.50 baht/kg) → Ready-to-drink milk (retail prices):
- UHT (11–12 baht/250 ml),
- pasteurized (38–40 baht/litre),
- sterilized (10–12 baht/125 ml)
Annex III: Imported dairy products (volumes and values) during 1998-2007

| Years | SMP | | WMP | | Cheese |
|-------|-----|-----|-----|-----|-------|-----|-----|-----|-----|
|       | Volume | Value | Volume | Value | Volume | Value | (tonnes) | (million baht) |
|       | (tonnes) | (million baht) | (tonnes) | (million baht) | (tonnes) | (million baht) |
| 1998  | 53 041   | 4 073.96 | 34 775 | 3 823.96 | 1 313   | 176.73 |
| 1999  | 56 036   | 3 313.96 | 31 984.25 | 2 953.40 | 1 370.52 | 166.32 |
| 2000  | 53 024   | 3 661.54 | 34 495.24 | 2 750.59 | 1 666.38 | 181.79 |
| 2001  | 58 823   | 5 824.16 | 28 028.52 | 2 592.30 | 2 542.78 | 311.22 |
| 2002  | 76 466   | 4 928.54 | 31 605.76 | 2 294.81 | 2 385.44 | 288.24 |
| 2003  | 73 657   | 5 038.79 | 31 595.13 | 2 301.27 | 2 928.70 | 348.01 |
| 2004  | 68 020   | 5 445.34 | 32 142.13 | 2 618.95 | 3 174.26 | 421.20 |
| 2005  | 69 671   | 6 380.42 | 29 116.40 | 2 540.16 | 2 876.21 | 436.55 |
| 2006  | 66 835   | 5 535.03 | 28 319.76 | 2 433.94 | 3 909.80 | 560.26 |
| 2007  | 56 940   | 7 458.66 | 22 616.89 | 2 197.43 | 4 846   | 699   |
Annex IV: Dairy free trade agreements and MOAC offsetting measures

1. World Trade Organization

Thailand has to comply with an agreement on trade of agricultural products under the Uruguay Round of WTO trade talks. In that agreement, the ratio on raw domestic dairy product(s) to imported dairy product(s) is applicable. In the case of skimmed milk powder, Thailand is committed to open its market and allow imports of skimmed milk as per the following volumes and tariffs (1995–2004):

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume (tonnes)</th>
<th>Tariff (%) Within quota</th>
<th>Tariff (%) Outside quota</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>45,000.00</td>
<td>20</td>
<td>237.6</td>
</tr>
<tr>
<td>1996</td>
<td>46,111.11</td>
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<td>47,222.22</td>
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<td>2000</td>
<td>50,555.55</td>
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<tr>
<td>2001</td>
<td>51,666.67</td>
<td>20</td>
<td>223.2</td>
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<td>2002</td>
<td>52,777.78</td>
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<tr>
<td>2003</td>
<td>53,888.89</td>
<td>20</td>
<td>218.4</td>
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<tr>
<td>2004</td>
<td>55,000.00</td>
<td>20</td>
<td>216.0</td>
</tr>
</tbody>
</table>

Source: Department of International Trade

There has been no progress made on the WTO agreement on trade of agricultural products since 2005; thus, the figures remain unchanged since 2004.

2. TAFTA – Thai-Australian FTA

Entered into force on 1 January 2005, this agreement allows a 4 percent quota on the binding quota to the WTO agreement. In 2004, it was 2 200 tonnes, which will increase to 3 523.55 tonnes in 2024, with the initial tariff (in 2004) not exceeding 20 percent in 2005. This tariff will be reduced at 1 percent per annum until it reaches 0 percent in 2025; thereafter, no measurement on the import quota is applicable.

3. TNZCEP – Thai-New Zealand Closer Economic Partnership

Entered into force on 1 July 2005, this agreement states that there will be no additional quota within 20 years – until the free trade on skimmed milk is applicable in 2025.

4. Measures undertaken/to be undertaken

The Thai Ministry of Agriculture and Cooperatives (MOAC) raised funds for the diversification of agricultural production in 2004 to: i) diversify agricultural production and agricultural products, ii) strengthen production capacity, iii) raise quality of agricultural products, iv) enhance processing of products and iv) promote the expanded processing of value-added products.

So far, this fund has allocated budgets for two projects, as the follows:

- Project to lower production costs and improve dairy raising capability and efficiency. The budget of 43 764 000 baht was allotted for a six-year project (starting in 2008).
- Project to improve production capability and efficiency and to expand markets for dairy cattle and dairy products. A budget of 12 560 000 baht for a three-year project was allocated (starting in 2008).
## Annex IV: SWOT analysis of the dairy sector

<table>
<thead>
<tr>
<th>Strengths</th>
<th>How to build on them</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy farmers earn from selling their milk year around.</td>
<td>Research on the optimum farm size under the limited land, labour, feed resources, etc. (environmentally friendly dairy farms).</td>
</tr>
<tr>
<td>Agricultural by-products and wastes, such as sugarcane tops, paddy straws, pineapple peel, corn stover, etc., are available as feed for dairy cattle.</td>
<td>The nutritional value of straw needs to be improved: Under small farm conditions during the dry summer season, cows lack both quality and quantity of roughage; the crop by-products, mainly paddy straw, do not provide sufficient nutritional needs.</td>
</tr>
<tr>
<td>There are suitable dairy cattle breeds for hot and humid environment in Thailand.</td>
<td>Research should be expanded to include the improvement of animal management and housing systems in hot and humid environment.</td>
</tr>
<tr>
<td>Modern dairy technologies are well adapted in Thailand.</td>
<td>R&amp;D on new dairy products from raw milk should be strengthened to create more value-added dairy products.</td>
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<table>
<thead>
<tr>
<th>Weaknesses</th>
<th>How to correct them</th>
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<tbody>
<tr>
<td>The main product from raw milk is drinking milk and there is a lack of R&amp;D on new dairy products.</td>
<td>R&amp;D on new dairy products is needed, plus marketing research to meet cultural and traditional needs of Thai consumers.</td>
</tr>
<tr>
<td>The weak farmer institutions, such as cooperatives, farmer groups or associations, weaken delivery of services and technology transfer to their members or smallholder farmers.</td>
<td>The farmer institutions need strong support from the Government (attention and supportive policies on R&amp;D to promote the use of local resources and technologies).</td>
</tr>
<tr>
<td>Local raw milk prices are not competitive with other imported dairy products.</td>
<td>In developed countries, especially in the European Union and the United States, domestic and export subsidies are given directly or indirectly to dairy farmers. The Thai Government and other developing country governments need to raise this issue at the World Trade Organization forum.</td>
</tr>
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<table>
<thead>
<tr>
<th>Opportunities</th>
<th>How to pursue them</th>
</tr>
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<tbody>
<tr>
<td>Milk consumption in Asia is on a rising trend due to the rapidly expanding populations. Hence, there is good opportunity for Thai enterprises to export their dairy products.</td>
<td>Promotion of R&amp;D on new dairy products.</td>
</tr>
<tr>
<td>Thailand has established cross-breed dairy cows that are suitable for hot and humid environment.</td>
<td>Good planning and management on animal health and product hygiene to secure quality of Thai dairy products (for both domestic and export markets).</td>
</tr>
<tr>
<td>The Thai Government, recognizing the existing rural malnutrition in children, launched a unique school milk programme to promote milk drinking among school children and thus improve the health and welfare of the young generation.</td>
<td>Continue to promote milk drinking campaigns and educate people on the nutritional value of milk (and other dairy products).</td>
</tr>
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<table>
<thead>
<tr>
<th>Threats</th>
<th>How to avert them</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free-trade agreements between Thailand and Australia as well as New Zealand opened up markets for milk imports (mainly for cheap milk powder) that, since 2004, have threatened local dairy farms and industries.</td>
<td>Pursue negotiations at national and international fora on the unfair agreements and subsidies on milk products in developed countries</td>
</tr>
<tr>
<td>Per capita milk drinking of Thai people is still low (Thais are not milk drinkers by habit).</td>
<td>Promote milk-drinking campaigns to educate people on the nutritional value of milk (and milk products).</td>
</tr>
</tbody>
</table>
References


Viet Nam: The emergence of a rapidly growing industry

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Hanoi

Background

There is no historical tradition in Viet Nam for the production or consumption of dairy products. For centuries, cattle were used for draught power, manure and meat production. Colonials brought the first dairy cows to Viet Nam at the end of the eighteenth century, with scattered imports of animals from various sources (Australia, China, Cuba, France and the United States). After the wars and during the nationalization and collectivization period, there emerged large state-owned dairy farms, mainly in the North and central region.

The Doi Moi (economic reform) in 1986 initiated a new era of dairying in Viet Nam, with the privatization of the production (smallholder private farms) and marketing sector (emergence of the informal sector as well as the private and semi-private formal sector), accelerating a rapid development. The current dairy development in the country is rooted in the National Dairy Development Plan (NDDP) and reinforced by Government Decision No.167, with provincial authorities providing follow-up support.

Decision No.167 (October 2001) is a policy to develop milch cow husbandry to a production target of 350 000 tonnes of fresh milk by 2010, or about 40 percent of domestic demand, to reduce the dependence on the world milk market but also to save foreign exchange.

Through the NDDP, the total dairy cattle herd population increased from only 35 000 head in 2000 to 113 200 head in 2006 and some 19 800 dairy farms, with an average of 5.3 head per household (Ministry of Agriculture and Rural Development, 2007).

National milk production has been significantly growing as a result, from 12 000 tonnes in 1990 to 215 900 tonnes in 2006, with annual milk gains variable. The largest jump in production was in 2002, with output rising over 60 percent, attributed to gains in both dairy cow numbers and productivity. High demand for fresh dairy products, particularly in Viet Nam’s big cities, drives production. In 2005, per capita fresh milk production reached 9 kg, a 29 percent increase over the year before, though it is still low in comparison with other countries in the region (FAO, 2006).

By region, the average number of dairy cows per household is 3.7 in the North, 6.3 in the South and 3.6 in the central area. Each region has one zone, set up by provincial governments with provisional support for initial phases of development, for concentrated industrial farms (with 1 000–2 000 head), such as Tuyen Quang in the North, Thanh Hoa in the Central area and Ho Chi Minh City in the South. There are two main dairy production systems in Viet Nam:

- Private production, which includes small- and medium-scale producers who are mostly private farms, private domestic or joint venture companies. This system generates 95 percent of the total milk production in the country.
- State-owned farms/stations generating the remaining 5 percent of the total milk production in the country.

Despite recent achievements, milk production remains significantly below consumption – domestic dairies met only about 22 percent of domestic demand in 2005. Imports of dairy products, mainly in the form of skim and whole milk powder, currently supply 80–85 percent of the domestic demand. In 2005, Viet Nam’s dairy product imports increased to more than US$300 million and further accelerated in 2006, with imports of $168 million only in the first six months.
Viet Nam imports dairy products from various countries, including Australia, the Republic of Korea, the Netherlands and the US. The import volume from the US for milk and milk products has increased sharply, from 5,516 tonnes in 2001 to 39,934 tonnes in 2005, and continued to rise into 2006. Viet Nam’s dairy product import growth is forecasted to continue in line with increasing living standards, especially in big cities. However, demand still exceeds domestic production capacity.

In Viet Nam, dairy companies play a dominant role in the dairy sector, focusing primarily on milk procurement. Currently, approximately 20 companies collect and process milk and dairy products, of which the three most relevant companies are VINAMILK, Dutch Lady and Nestlé. According to the Ministry of Agriculture and Rural Development (MARD), VINAMILK collects more than 60 percent of milk production, Dutch Lady takes 18 percent, Nestlé and the other 17 companies gather the remaining 22 percent.

Trade policy in the context of WTO integration

Viet Nam protects its indigenous dairy industry with tariffs on imports of dairy products and duty quotas. According to an early International Research Centre study on the Vietnamese level of trade protection, the dairy sector enjoyed “considerable benefits from governmental interventions” with a nominal rate of protection calculated at 22.6 percent and an effective rate of protection at 36.6 percent (Sullivan, 2002).

During the negotiations for Viet Nam’s membership into the World Trade Organization (WTO) and its ensuing accession in early 2007, there was considerable pressure on the Government to reduce its current import tariffs on dairy products. These tariff pressures were preceded by ASEAN Free Trade Area (AFTA) tariff negotiations and reductions, which were agreed upon in 2005.

The main area of concern was linked to import tariffs on skim milk powder and whole milk powder. Tariff levels on other dairy products were also important, such as UHT milk and butter oil, which were products that could be produced in Viet Nam. But a lowering of the import tariffs potentially jeopardizes the ambitious plan of the Government to substitute imported dairy products with locally produced raw material. There is, therefore, a tangible risk that the Government’s plans to expand the dairy sector will not be fulfilled if the tariff rate falls below its existing level.

Exporting countries to Viet Nam are grouped into two categories:

1. 1) WTO members with whom Viet Nam applies the most favoured nation (MFN) tariffs, with tariffs on manufactured dairy products currently that 30 percent, while tariffs on raw material and pre-manufactured products (among others, skim and whole powder) currently at 10–15 percent, depending on the kind of product and on its fat and sugar content.

2. 2) AFTA members, for whom common effective preferential tariffs (CEPT) apply. In 2005, the CEPT tariffs for dry skim and whole milk powder were subjected to a 10 percent tariff and were reduced to 5 percent for both categories by 2006. CEPT tariffs also depend on the kind of product imported and on its fat and sugar content.

Recent trends and expected future developments in the dairy sector

High growth rates slow in recent years

The average milk production growth between 2000 and 2006 was 27.2 percent, with the growth peak in 2003 at 61.6 percent (Table 1). The quality of the dairy cattle also has increased, depicted by milk production figures, which reveal a higher growth rate than that of dairy cattle numbers. However, since 2003, the pace of growth has been slowing down, reflecting several problems in the dairy sector, as discussed later in this case study.

54 The nominal rate of protection and the effective rate of protection are usually employed to measure the protection awarded to local industries.
Table 1: Dairy cattle and milk production, 2000–2006

<table>
<thead>
<tr>
<th>Product</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy cattle (million head)</td>
<td>35</td>
<td>41</td>
<td>55</td>
<td>79</td>
<td>95</td>
<td>104</td>
<td>113</td>
</tr>
<tr>
<td>Growth rate (%)</td>
<td>17.14</td>
<td>34.15</td>
<td>43.64</td>
<td>20.25</td>
<td>9.47</td>
<td>8.72</td>
<td></td>
</tr>
<tr>
<td>Milk production ('000 tonnes)</td>
<td>51.4</td>
<td>64.7</td>
<td>78.4</td>
<td>126.7</td>
<td>151.3</td>
<td>197.7</td>
<td>215.9</td>
</tr>
<tr>
<td>Growth rate (%)</td>
<td>25.88</td>
<td>21.17</td>
<td>61.61</td>
<td>19.42</td>
<td>30.67</td>
<td>9.21</td>
<td></td>
</tr>
</tbody>
</table>


Strong support from government and local authorities

Strong government commitment to the development of the dairy sector has greatly contributed to a rapid expansion of dairy activities throughout the country. The NDDP aims to: i) replace imports, ii) generate rural employment and iii) increase rural incomes.

In 2005, the Ministry of Industry issued Government Decision No. 22 on “approving the master plan on development of the milk industry in Viet Nam till 2010 and planning to 2020”. It targets an increase of indigenous milk production to meet per capita consumption of 10 kg in 2010 and 20 kg in 2020, with a self-sufficiency proportion of 40 percent by 2010 (300 000 million tonnes).

Provincial governments also have generated dairy development policies that include provisions such as:

- compensation of 200 000 dong per male calf born (in the first three years of a provincial dairy project);
- subsidy (2–3 million dong) for the purchase of Laisind cows for artificial insemination with the dairy breed;
- subsidy (5–7 million dong) for the purchase of exotic dairy cows;
- interest-free (1–3 years) bank loan for the purchase of dairy cows;
- support for costs for cow shed improvements;
- support for grass production costs;
- support for milk collection and transportation.

In addition, some provinces have:

- exempted taxes on agricultural land;
- prioritized land availability for fodder production.

Milk productivity is increasing steadily with an appropriate breed strategy

From 2000 to 2006, the average milk productivity of cross-bred Holstein-Friesian (HF) cattle increased from 3.8 tonnes to 4.7 tonnes (in a 305-day period; MARD, 2007). This productivity is comparatively higher than that of other countries in the region (China at 3.4 tonnes, Thailand at 3.2 tonnes, Indonesia at 3.1 tonnes).

The increase of Holstein-Friesian cross-bred cattle (through an artificial insemination programme) is considered the backbone of the NDDP and the main booster of milk production in Viet Nam. The breeding programme benefits farmers by increasing the body size and growth rate of local cattle and thus improving their productivity. The dairy breeding programme is then implemented by inseminating local improved cows with pure Holstein-Friesian bull semen to produce the cross-bred cows.

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55 Nancy, B.L. et.al, 2006
As result, 14 percent of total dairy cattle population currently is pure Holstein-Friesian cows, 85 percent is cross-bred (with a cross-bred proportion growing from 50 percent to 75 percent to 87.5 percent); only 1 percent is some other breed. Some 47 000 (41.5 percent) of the total 113 200 dairy cattle were carefully selected and recorded in the national cattle breed book, which can be accessed freely via the Internet. All the semen for inseminating is also selected from potential bulls, which can ensure greater milk productivity.

Dairy development lessons accompanied by failures in unfavourable regions

In its Decision No. 167, the Government approved only 12 provinces for participation in its dairy development plan. However, 33 provinces ended up in the final plan due to direct request from the People’s Committee in the other provinces.

In 2006, those 33 provinces maintained a dairy cattle sector. However, according to the MARD, within the first six months of 2006, the dairy cattle population decreased sharply in 12 provinces (Department of Livestock Production, 2006). The proportion of unqualified heifers increased, with calves and even milking cows left for slaughter in those provinces. In the North, cattle numbers declined in Thai Nguyen province by 45 percent, in Phu Tho by 68 percent, in Thai Binh by 37 percent, in Ha Nam by 18.5 percent; in the South, they decreased in Tra Vinh by 80 percent, in Vinh Long by 34 percent, and so on.

The decline was attributed to insufficient preparation of the dairy cows for milk production and the lack of fodder supply, due to unfavourable natural conditions or the lack of production zone planning. Pure Holstein-Friesian cows were imported but proved not so appropriate with the local climate and more difficult for farmers lacking experience than cross-bred cows. Also, many dairy farms were distant from a dairy company, a situation compounded by the lack of collection and storage facilities.

Box 1: Failures of dairy development plan in inappropriate provinces

Tuyen Quang became the first province to announce its failure with the National Dairy Development Plan. Over a four-year period (2003–2006), the province imported 3 279 pure Holstein-Friesian cows. But by September 2006 only around 1 000 of them were alive. The loss was attributed to insufficient infrastructure, lack of efficient management and that the plan was an exercise in “central planning” rather than an economic development plan.

In 2000, the Department of Agriculture and Rural Development (DARD) of Son La province requested the Provincial People’s Committee to import 100 dairy cows in order to set up pilot demonstrations at potential dairy farm households. However, the People’s Committee approved a plan to import 6 000 dairy cows. The DARD later recorded that of those 6 000 cows, only 945 cows were in lactation, 222 had died and the rest could not conceive.

Source: Rural Economy Newspaper, September 2006

Scale of production at the household level is increasing

The average number of head per dairy cattle herd is increasing, and the proportion of herds with less than five heads is decreasing. The typical herd now consists of five to ten head. Economies of scale are considered the most important reason for this change, with capital availability the biggest constraint to increasing the scale of their production, especially among the smallholders.

Dairy companies depend on imported milk powder rather than domestic fresh milk production

Import dependency has resulted in a value-chain segmentation among the milk producers, milk processors and milk consumers, each of whom have different priorities. Because domestic production meets only 22 percent of the total demand of dairy companies, international market developments influence the Vietnamese dairy sector. For instance, domestic milk powder price decreased in Viet Nam after its WTO accession in
2007. By importing milk powder to process “fresh milk”, milk companies have had greater profits than when using domestic fresh milk. And it partially explains why the price of fresh milk, which was mostly procured by the large-scale milk companies, remained constant (at least from 2002 to 2006) while the input costs rapidly increased.

On the consumption side, fresh milk supplies are not highly appreciated by Vietnamese consumers, who seem to consider the short shelf life of pasteurized milk as an indication of inferior quality. In addition, the low prevalence of home refrigeration, especially in rural areas, makes UHT milk more convenient for consumers. However, as average income increases in Viet Nam, processors are expecting some shift of consumption habits, from UHT milk to pasteurized milk. Changes in habits are helped along by marketing and improving awareness on the quality of pasteurized milk in contrast to UHT milk, as Nestlé has discovered.

**World price increases translate to opportunity for Viet Nam dairy farmers**

From June 2007, two of the main dairy companies, VINAMILK and Dutch Lady, increased the farmgate price from 4 600 dong per kg to, first, 5 000 dong per kg and then to 6 400–6 800 dong per kg at the end of June 2007. The world demand for milk in 2007 increased sharply (by 35–100 percent), pushing up prices, particularly in a context of drought and reduced-fodder availability. Additionally, some European Union countries cut the subsidies in the dairy sector, making the milk price rise closer to the real value of products.

This is a real opportunity for dairy farmers in Viet Nam. The price gives farmers a profit of 3 000–3 500 dong per kg, or 45 000–52 000 dong per day ($2.8–$3.25 per day) for 15 kg of average daily yield per dairy cow, a very valuable income for rural households. The cost of dairy calves also has decreased, from 24 million dong per head (as a result of the high demand at the peak period of the NDDP) to 17–19 million dong per head (considered the “real” price of a calf).
Figure 1: Milk flow and dairy price charts

- **Formal sector**: 81%
  - Collecting centre: 80%

- **Informal sector**: 19%
  - Milk from dairy farmers: 3,500–4,500 dong/kg
  - Middlemen: 15%
    - 6,500–7,500 dong/kg
  - Retailers: 4%
  - Collecting centre: 4,200–4,500 dong/kg
  - Milk companies

- **From dairy farmers**: 3,500–4,500 dong/kg
  - Middlemen: 15%
    - 6,500–7,500 dong/kg
  - Retailers: 4%
    - 7,500–9,500 dong/kg
  - Collecting centre: 4,200–4,500 dong/kg
  - Milk companies

- **Middlemen**: 6,500–7,500 dong/kg
  - Retailers/distributors: 8,500–9,500 dong/kg
  - Collecting centre: 4,200–4,500 dong/kg
  - Milk companies

- **Retailers/distributors**: 8,500–9,500 dong/kg
  - Collecting centre: 4,200–4,500 dong/kg
  - Milk companies

- **Consumers**: 8,000–9,500 dong/kg
  - Collecting centre: 4,200–4,500 dong/kg
  - Milk companies

Price ranges:
- 3,500–4,500 dong/kg
- 4,200–4,500 dong/kg
- 6,500–7,500 dong/kg
- 8,000–9,500 dong/kg
- 10,000–12,000 dong/kg
Smallholder farmers move into dairy production

Success of the NDDP and other support programmes/projects

Box 2: A smallholder farmer finds success in Dong Nai province

Like many other farmers in Long Thanh, Dong Nai province, Lam Quang Tri lived a hard life cultivating primarily cashews and rice, although he owned some goats and sold their milk. In 1982 he recognized that the goat milk was limited, with one goat producing only 1 litre of milk a day. So he looked into dairying, in which one cow produces 10 litres of milk a day. He sold the family’s jewelry and borrowed from relatives to buy six Sind cows. He then set aside 1 ha (most of his land at that time) for planting grass as feed for his cows.

Each time a cow became sick, he turned to a veterinary technician at the An Phuoc Cow Factory for help. Eventually he began reading books on cattle husbandry and found ways to treat his cows on his own. Although he also sought out professors at the Agricultural University and the Southern Institute of Agricultural Science on disease treatment, raising techniques and cow-development methods.

In 1985, his cows began producing milk. At first he tried selling it locally, but people were not familiar with such fresh cow’s milk. He then learned how to treat it by cooking it in a two-layer bain-marie and then distilling it into clean glass bottles. The locals were still reluctant to even try it. So he made yogurt and offered it plus the milk for free, at least to people he knew. The approach worked, and after just a short time, his customer base increased quickly. His sterile fresh milk is now famous in the region.

In 2003, Mr Lam Quang Tri’s herd grew to more than 100 cows and his grassland expanded to 5 ha. He signed a contract to sell a portion of his milk to the An Phuoc Milk Company, which sells processed milk to VINAMILK.

Mr Lam Quang Tri’s success is largely a tribute to his creativeness and responsiveness to the market. That he achieved a stability of input from his own grass and feed provided through contracts with a local animal feed company also helped. And the technical and extension agents he sought out at scientific institutions also played a crucial role. However, in 2004 the farmer encountered several difficulties, especially increased prices for feed, labour and transportation and decreased milk prices. This led to a reduction of his herd to 80 cows and a loss of revenue by 30–35 percent.

Most smallholders took up dairying as a result of government support, such as Government Decision No. 167, a policy that sought to increase domestic production and reduce dependence on the world market. The Government’s nationwide initiative encouraged provincial leaders to produce ways to help establish and expand dairy cow production, especially among smallholder farmers, as the example in Box 3 describes.

Box 3: Dairy development plan implemented in many provinces

After the declaration of Government Decision No. 167, the Thai Nguyen provincial leader initiated a dairy development production project in October 2003, with an investment of 21 billion dong. The project provides a household with 4 million dong to buy an exotic breed of cattle or 3 millions dong for a domestic breed, 200 000 dong for each male calf and 70 000 dong for each 360 sq m of grassland for feeding the herd. This plan proved to be a good incentive to shift farmers in Thai Nguyen from a solely crop production to one that includes dairy cattle husbandry.
As the story in Box 4 illustrates, rural development projects and programmes have played a crucial role in the development of smallholder milk production.

**Box 4: An integrating farm success with CIDA support**

Seven years ago, Lieu Van Do and his family, members of the Kho Me ethnic minority in Soc Trang province, had a tough life with poor living standards despite their hard work on 1.5 ha of paddy field. In 2002, Mr Lieu Van Do participated in the a programme called Improving Rural Household Living Standards that was funded by the Canadian International Development Agency. The family received a dairy cow and training in breeding experiences from a dairy production model developed in Binh Duong. Five years later, the family’s herd had grown to seven cows. In 2006, two of their cows produced 3.5 tonnes of milk in a ten-month period, netting them more than 20 million dong in profit. Two more cows are of breeding age and will likely milk soon. The family built a new house and Mr Liew Van Do is looking to expand his herd.

While the Government has provided support for entering the sector, the processors set the pricing and payment systems. Box 5 describes the payment scheme of one of the biggest dairy companies.

**Box 5: Dutch Lady Viet Nam’s payment system**

According to 2005 information from Dutch Lady Viet Nam (DLV), the company has an elaborate but transparent pricing system, based on strict quality standards and results: minimal standards are 3.5 percent fat, 12 percent total solids and a 4 Rezasurin grade on a scale of 6 as the top quality. (In 2004, records indicate that the DLV had an overall quality rating of 3.8 percent fat, 12.3 percent total solids and a 4.1 Rezasurin grade.)

DLV operates various quality check-ups, the first at the collection point and the other at the milk-chilling centre. If milk is rejected at the milk collection centre, it is returned to the collection point so that other farmers do not have to bear the responsibility for bad quality.

Milk payment is made every 15 days and based on the daily average results of the collection points and on random individual quality checks (one per payment period). If individual farmers have a lower quality than the group’s average, they are penalized; if they have a higher quality, they are rewarded. Specialized farmers receive individual payment.

In 2005, DLV developed a software program for making its payments. Results from weighing and quality checks are registered; farmers receive a payslip that they can check against their own production records. Upon presentation of their bi-monthly payslip, farmers receive payment from the bank.

**The impact of NDDP slows**

Smallholder dairy farmers can only enter the sector with financial support. Dairy production demands large capital input (high initial investment for cows and a shed) and technical capacity. In particular, prices for a dairy cow are high, usually exceeding the capital available to a smallholder farmer. Too often, credit schemes proposed by the banks and supported by the Government do not match people’s situation, such as the high transaction costs, strict collateral on land titles and other assets. Thus, smallholder farmers who typically lack liquidity capital took up dairying because of the supporting programmes and projects of the Government or dairy companies.

But the support has been problematic at times. In fact, it threatened the involvement of smallholder farmers in several provinces at one point due to the “fever” on prices of breeding stock and inputs. The strong support from provincial governments through subsidies for the purchase of cows/heifers “sparked a race
between farmers to buy profitable imported breeds”. “…The buying spree guaranteed profits because the farmers were supported by their provincial and municipal officials to obtain fodder and diseases resistant stock.” (Viet Nam News, 17 September 2005). Consequently, provincial decisions and their “facilitating conditions” created a “fever” on prices of breeding stock and other inputs. In particular, the price for a dairy cow doubled or even tripled in 2003, to as high as 30 million dong.

In addition, although provincial and district subsidy and encouragement measures are important, they are often issued in haphazard ways. In Tien Du district, Bac Ninh province, for example, some farmers received subsidies twice to purchase two batches of cows, while theoretically only the first batch can be subsidized (to encourage farmers to raise their own progenies). One farmer even reported having raised his own calves but declared them as purchased from a third party in order to receive a subsidy of 3 million dong. The policy of subsidizing cows/heifer/calves purchased had further perverse effect on the quality of breeding stock. In the value chain of dairy production, as many studies have pointed out, the smallholder farmer is the segment that bears all the increased costs but gains less in the increase of benefit (Figure 1).

**Economies of scale helped exclude smallholder dairy farmers.** According to Professor Le Viet Ly (2006), the optimal scale for dairy production is more than ten head, meaning that most smallholder farmers cannot meet the requirement for the most efficient production.

**Smallholder farmers are not experienced and knowledgeable about dairy production.** Small-scale dairy producers receive government support, most of them lack the necessary information and technologies (such as breeding, feed supply sources, technology in storage and marketing skills). According to the MARD (2006), 22 provinces of the total 33 provinces with dairy production reported unsuccessful results with their dairy development plans. The NDDP rightly points out that the country lacks experience in dairy, the absence of any tradition common to most of the Southeast Asian countries. It would have been prudent for Viet Nam to learn early on from experiences of neighbouring countries – to avoid similar mistakes.

**Insufficient veterinary services.** Despite the Government’s strong support for breeding, the veterinary services have remained inadequate to serve the requirements of the dairy sector. In Viet Nam, the state veterinary service network spreads down to the district level, with the District Veterinary Station. However, at the commune level, there are mostly private veterinary paraprofessionals, so called “paravets”. Even though dairy cattle are prone to various health hazards, the state veterinary services are not systematically used or available to dairy farmers. Overall, the deficit of veterinary practitioners with sufficient knowledge in dairy production is a critical problem for dairy development in Viet Nam.

**Milk quality** is considered a major bottleneck in the absence of any standardized milk-quality testing scheme for the country and with no independent quality-control agency carrying out regular checks at farms, collection centres and processing factories. This situation causes more difficulties for smallholder farmers. Usually, smallholder farmers are paid a lower price for their output due to untested quality of their milk at the collection centre.

In most provinces where the NDDP failed, milk basins were set far from the market, which requires larger expenditures for transportation as well as directly affecting the milk quality. As a result, it makes domestic dairy products non-competitive with imported milk products.

Last but not least, the low procurement price of output was the most common driver of smallholder farmers out of the dairy sector during the 2004–2006 period. During that time, the farmgate price, which was set mainly by large-scale milk companies, was 3 200–4 100 dong, which did allow farmers to recoup their expenditure – but not to make a profit. Milk companies do not depend on fresh milk but on imported milk powder, while the dairy farmers depend on the companies. And with the milk procurement price set by those companies, not by the farmers, the dairy producers, especially the smallholders, bear all the risk of production.

In addition to the success stories of small dairy farmers, there are now many unsuccessful cases, as Box 6 describes. They at least offer useful lessons for the development of dairy production in the future.
Despite favourable policies and intervention mechanisms, two years after the Thai Nguyen provincial government began its support, the total dairy herd in the province attained only 20 percent of the planned targets. In that time, the government had distributed only 491 milk cows and 816 million dong subsidies to 199 households and enterprises. Among them, only 74 milk cows could be milked (accounting for 9 percent of the planned target). The dairy herd did not increase, leading to a reduction in grassland each year (although grassland can double in profit compared with the same area for farm production). In 2003, a total of 147 ha was planted as grass feed; only 82 ha was planted a year later but then dropping to 9.7 ha in 2005.

There are many reasons for this failure in dairy development. The most obvious one is that a comprehensive market study was not completed initially. Also, Thai Nguyen developed the dairy sector too fast, mostly as a movement – creating a “herd-effect” kind of activity.

In fact, when the project was implemented, almost every Thai Nguyen farmer did not understand that raising dairy cows is very different from raising other livestock. Even the authorities could not imagine the overall picture of the sector to properly prepare for it. In addition, the quality of breeding animals was not well chosen. To meet the demand for breeding, many agencies and enterprises hastily imported cow breeds, many of which were of good quality but not suitable to the region.

Breeding dairy cows requires considerable investment, with much more time needed to recoup costs and an output market difficult to control. Because of this, many farmers believed that the work was less profitable than expected, and thus gave up and sold their cows. An yet, initially they felt highly enthusiastic; they borrowed money to build facilities, to buy breeding animals, to shift to grass cultivation, to grow or purchase maize for feeding. Now, the “dream” of making money from raising dairy cows has disappeared, replaced by anxiety over selling produce and repaying the debts.

Contract farming and a vertical integration usually have positive effects on capacity-building and technical know-how development. The greatest danger is to “firmly bind” farmers (in certain cases, farmers lose their land if they give up dairying) and leave them virtually helpless and without advocacy rights. There are many reasons for the failure of contracts, usually caused by the lack of awareness and experience, as the following two examples (Boxes 7 and 8) explain.

Thai Nguyen provincial authorities expected dairy companies and farmers to sign contracts. Based on the contracts, a company would provide investment for milk-storage systems, facilitating the preservation of milk for purchase. However, up to now, there are no signed contracts. A company only invests when it is ensured that the farmers will provide enough milk for their production needs. Generally, one milk storage facility can hold at least 2,000 litres of milk a day. However, the current production level only fills 15–20 percent of that capacity. But many farmers have been waiting for a company to sign a contract before buying their dairy cows. This circle of reluctance has considerably impeded the project’s progression.
In 1998, Nestlé cooperated with the Ha Tay People’s Committee to encourage farmers to convert from rice growing to cow raising. With careful training, technology subsidies and inexpensive credit, many farmers made the switch and signed annual contracts with Nestlé. The company also provided other facilities, such as milk-collection terminals, complementary equipment and cleaning chemicals. By 2004, Nestlé was collecting 93 percent of the milk.

Under the contract, Nestlé buys milk from groups of farmers, and, in return, the group is obliged to sell all their milk to Nestlé. The farmers are responsible for building up their farms and paying for most inputs, such as feed, electricity, water and labour. Prices, which are determined solely by Nestlé, barely reflect the market price. However, Nestlé wants to ensure a stable price throughout the year under the contract, even if prices harshly fluctuate across a year.

Nestlé has a bonus and fine system to control the milk quality. Random samples of milk from each village are tested every month. Among the different issues, Nestlé is most careful about the proportion of antibiotic, which is only allowed to be less than one-billionth. To achieve such a small proportion, Nestlé trained the farmers and provided a gradual scale of qualifications.

The Nestlé contract system has produced a variety of experiences:

• Initially as contracted, Nestlé provided feed for households for dairy cows. The quality of feed was good at first but then became not so good. The farmers had no way of maintaining the expected milk yield and quality with the poor-quality feed. The farmers wanted more transparency and responsibility in this part of the contract.

• Nestlé’s quality control was one of the main barriers to the farmers maximizing their profit. Despite skill improvements across time, the farmers still complained about the low level of accepted antibiotic. It limited the incentive to sell to Nestlé because the final price after bonuses and fines was unpredictable. It also raised doubts among the farmers about the quality control system; consequently, the farmers started to question the company’s integrity.

• According to the farmers, the procurement price was low for a long time. The price used to be 2 700 dong per kg in 1998, typically providing a profit of 7–8 million dong a month from ten head of dairy cows. Farmers could then take good care of their cows so that they provided more and better milk. In 2006, the price lifted to 3 200 dong per kg, which was higher than in 1998 but barely profitable, considering the significant increase of input costs. One farmer, who had to reduce his herd to four cows due to the maintenance costs, reported earning only 400 000 dong per month, after subtracting for all the costs.

The low prices resulted not only in a lower quality but also a lower quantity of milk; the amount of milk produced by each dairy cow decreased to only 10–12 kg per day, compared to 18–20 kg per day in the 2004–2005 period. Deep in the milk-price crisis, the farmers were trapped in a frustrating cycle in which a small income from milk provides insufficient nutrition for the cows. The cows, in return, provide low milk quality and quantity, thus producers earn even less money. Many of contracted farmers coped with the crisis by slaughtering the cows that didn’t provide enough milk and changed to other businesses.

Nestlé offered no solution for the contract violations. There was no legal system that the company could rely on nor could it bind the farmers economically. Further, there was little threat of the company’s refusal to renew the contract because it lacked milk and needed as much milk as it could obtain. The company now has resorted to powdered milk as an alternative input for production.

As an attempt to target the problem of reduced milk quantity, Nestlé decided to buy milk by cluster. Each cluster had a leader, elected by the members, and then trained by the company. The cluster leader ensure that the farmers supply the contracted amount of milk and distribute the company’s payment to everyone. In an attempt to strengthen the contract system, Nestlé offered the leader a fixed salary and payment for his/her electricity bill. As more farmers started to break the contract arrangements, the company decided to award the cluster leader with 200 dong for each kg of milk collected to increase his/her incentive.
Buying milk by cluster also helps Nestlé better control the quality of the milk because the milk from many households is now stored in one container. If one household has antibiotic in the milk, it will affect others economically and lead to social costs. The households will, hence, monitor one another to ensure mutual benefit.

Unfortunately, having the cluster leader as the mediator has caused occasional conflicts within each cluster. Even though he/she was elected by the farmers, the leader is sometimes non-transparent in distributing payments. For example, a leader might receive payment from the company but delay the distribution. The company has yet to find a way to tackle this conflict. At the end of 2006, the rate of contract violations, estimated by the company’s business director, was approximately 50 percent, though the real rate could actually be higher.

Prospects

The following outlines important strategic lessons for the local dairy sector to competitively supply growing markets in the future:

- The National Dairy Development Plan and subsequently Decision No. 167 (amended), concentrated technical and financial efforts in the “dairy priority zones”, identified in a manner similar to what has been used for priority “economic zones”. However, the criteria for such zones should be: i) a tradition in dairying, ii) an existing level of technical know-how, iii) availability of processing facilities and current access to markets, iv) climate and natural constraints/strengths, v) land availability for fodder cultivation and vi) availability of industry by-products.

- Smallholders tend to disappear from dairy production in crisis periods. Typically, smallholders are more vulnerable because they are relatively new to dairying and did not have enough time to gather sufficient resources to pay back their debts and enlarge their herd.

- All efforts should be made to strengthen the capacity of existing small- and medium-scale farmers who show a potential to enlarge their herd (enough land, interest, technical know-how) smallholders should, whenever possible, be encouraged into interest groups in order to lower their production costs. The organizational approach should be addressed step by step (primarily by forming interest groups or clubs rather than cooperatives). Active exchange of experiences should be promoted by study tours to private farms and existing interest groups.

- Developing very large farms with the latest technology might, at this stage, not be sustainable in Viet Nam. Large estates should not be artificially created by the central or provincial governments (exceptions might be joint ventures, drawing foreign capital and technical inputs) but should naturally evolve from existing large private structures.

- To resolve limitations imposed by farmers’ lack of dairy experience, extension agents and veterinary staff, it is necessary to have financial and technical efforts to tackle the human resources constraint. Technical staff with existing knowledge in dairy (veterinarians, extension agents) should be used as trainers in the areas identified as priority dairy zones. Extension agents in priority dairy zones should be specifically trained on dairy issues, not only on theoretical matters but on practical topics (hand milking, feeding, heat detection, deliveries, management of animals, etc.).

- In each zone, successful farmers with sound technical knowledge should be identified as possible farmer-to-farmer trainers. Farmers should be intensively trained on relevant topics (heat detection, calf raising, feeding, hygienic milking, basic detection of health disorders, etc.), possibly on their farm rather than at a station (exchange of experience with successful farmers).

- Regarding the situation of breeding policy and breed selection, Viet Nam should emphasize improving the management of the various types rather than on the appropriate level of exotic blood.
For feed and fodder availability, significant efforts are needed to establish “priority fodder-growing areas” in communes with dairy production. Villages, communes and districts of priority dairy zones should elaborate a plan for fodder-growing suitable to existing conditions (Taking into account irrigation facilities and constraints, seasonality and land quality).

Smallholder farmers should be encouraged to buy feed, industrial by-products (brewery waste) and crop residues (rice straw) in bulk to short-cut several layers of middlemen. This can be achieved by encouraging farmers to form interest groups or clubs (rather than cooperatives, which often have a negative connotation).

To give more incentives for the smallholder dairy farmers, a new pricing system should be set up, based on a basic milk quality (fat, protein, total solid, bacterial count and absence of antibiotics). The basic payment system should be similar throughout the country, with private processors free to establish their own payment schemes.

To overcome higher prices for bad quality paid by private agents and middlemen, a quality-based payment system should be implemented, similar to the Dutch Lady system: The higher the quality, the higher the price.

At present, the economic viability and the competitiveness of Viet Nam’s dairy sector is biased by the factor of “heifer sales”. The purchase of cross-bred heifers or cows should not be subsidized or encouraged by loans or other incentives. The raising costs of heifers should be assessed on a large scale, depending on the production area (urban, peri-urban and rural). Ideally, the sales price of heifers should cover the raising costs and allow for a reasonable margin.

To reduce the initial investment costs, farmers should be encouraged to produce their own cross-bred progenies, knowing that they run the risk of producing male calves and that dairy production takes more time to develop.

Proper guidelines on contract conditions (such as no firm binding of dairy production and land use rights) should be issued by the national authorities. Contract dairy farming should be discussed with the major processors and the relevant ministries in order to create a general framework.

**Box 9: Key definitions**

**Smallholder dairy farmer:** Someone who has one to three cross-bred cows, typically occupies less than 0.5 ha of land and represents the less-commercially managed dairy systems in the area.

**Smallholder milk producer:** A smallholder dairy farmer is also a smallholder milk producer. The family consumes 8 percent of the milk produced; the surplus is sold to the local milk collection centre. The main source of income is own-farm employment (dairy and cash crops).

**Formal markets:** Dairy companies that operate the processing facility in a dairy zone (such as collection centres set up at the commune level) and typically buy their milk either directly from farmers or via a middleman.

**Informal markets:** Milk sellers and buyers in a neighbourhood or village. It includes smallholder dairy farmers and smallholder milk producers who sell some of their farm produce to the local market.

**Dairy value chain:** The various stages through which milk and milk products pass from farm to the final consumer.
References


Models and opportunities for smallholder dairy producers in Asia: lessons learned

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It is clear that the demand prospects for dairy products are expected to remain strong in Asia. But the ability of smallholder dairy producers to benefit from the growing demand could be compromised in the rapidly globalizing market for milk products. Studies have shown that smallholder dairy producers remain competitive in many areas in developing countries (Stahl et al., 2003). However, their competitiveness amid the diversity of production and marketing systems for dairy in Asia is shaped by a myriad of factors that are largely contextual and influenced by geography, relative natural resource bases, socio-cultural factors, demand growth, demographics, economics and the status of an individual country’s economic growth and development.

These same influences also affect the variability of a country-specific dairy-development growth path, whether it is dominated by investments in large processing units, such as in China, cooperative systems, such as in India, or smallholder links, such as in South Asia where the informal market supplies a large amount of the fluid milk/artisanal products produced. Public policies and incentives fostering private-sector investment decisions also play an instrumental role in shaping the outlook for the sector and determining the role played by smallholders.

Identifying the lessons

Drawing from the previously presented FAO-commissioned case studies on dairy development, this chapter examines the critical factors influencing the success of various interventions to support dairy systems, with a focus on smallholders. It outlines country-specific responses to constraints and reviews the models and interventions in the region that have been influential in fostering dairy development.

Addressing the challenges related to dairy development in any country requires reviewing the factors that can be detrimental or conducive. Given the diverse nature of dairy demand, production systems and market structures across the Asian region, no broad summation is possible. However, the following observations and analysis of some of the regional lessons learned may be of relevance when considering action to support sector development.

In only a few countries have carefully targeted smallholder interventions been effective in supporting dairy development. This is particularly true because in many countries most smallholder production is channelled into traditional markets, which are largely neglected by policy interventions. In formal markets, market access is challenged by the fact that dairy product supply channels are rapidly changing, with supermarkets playing an increasingly important role in all countries. Specifically identifying entry points for smallholders is difficult. However, the following examples illustrate successful interventions:

- Supportive national and regional policies have been crucial, such as in China where more than 1 million smallholders were incorporated into the dairy sector through enabling systems of milk collection.

- In some countries, governments successfully set up dairy development zones (Philippines, Viet Nam, China). In the Philippines, the zones (which necessitate at least 300 farmers) proved most beneficial when linked to public–private partnerships (such as private sector breeding operations and initial support by the National Dairy Authority).
• Interventions that target the scaling up of dairy activities (Mongolia) proved advantageous when focusing on demand areas where there are many cattle and links to the main cropping area, thus providing access to crop by-products for feeding.

• Sustainable pro-poor social dairy programmes are those that have been linked to remunerative markets and were carefully targeted (Bangladesh, cooperatives in India, Philippines).

• Graduation from subsistence to commercial smallholder and/or larger-scale milk production occurs when the right policies and strategies are adopted (Bangladesh, India, Philippines, Thailand, Mongolia).

• School milk programmes using locally produced milk (as opposed to imported milk powder) have served as a catalyst for growth (Thailand, China, the Philippines).

• Almost all of the successful examples, such as the Anand model and project based initiatives in Bangladesh and Mongolia, have involved some type of donor involvement at the early on that was followed by country-specific commitment and support. The main exception is China, where the private sector and national/regional governments worked in tandem to support sector growth.

• Key to long-term balanced growth for smallholders in many countries lies in cultivating and supporting milk consumption in rural households (Bangladesh, India, Pakistan, and China). In China, despite strong growth in demand, per capita milk consumption of rural resident averages only 17 percent of that of urban residents (Hu, 2008).

Models that link smallholders to formal markets

In general, those models effective for engaging smallholders are those which: i) provide good economic returns; ii) have policy/institutional support from governments, either national or regional; and iii) are supported by active involvement from private sector milk-processing enterprises. In a globalizing economy characterized by cross-border movement of products, information, technology and financing, it is critical that all models be governed by supportive and enforceable standards and regulations to ensure basic adherence to modern food safety standards.

Cooperatives are often cited as one of the most effective way of grouping small dairy farmers to deal with the challenges of producing and marketing milk. The unique characteristics of milk require special considerations in terms of linking producers to markets. These characteristics include its perishability, the daily nature of production, the lack of synchronization between demand and supply, and the inability to quickly adjust supply to changes in demand. Even in countries such as the United States, dairy cooperatives handle a significant proportion of production: in 2002, for instance, cooperatives in the US accounted for an estimated 86 percent of farm sales (Kraenzle and Eversull, 2003; Ling, 2004).

In India, the dairy cooperative model has been perceived to be central to the development of its dairy industry, the largest in the world and one that has been based on integrating small and marginal farmers into a business environment. However, while successful in numerous states, in particular the Amul cooperative in Gujarat, not all have flourished. In many other areas of India, the cooperative movement has been less successful in empowering farmers and transforming dairying into a means of development for rural people. The challenges include: i) cultural, socio-economic constraints in replicating the model; ii) the critical need for democratically elected management and, in particular, the need to avoid state-management; and iii) difficulties in ensuring competitiveness with the private sector. Another example is the Milk Vita Cooperative in Bangladesh where periodic state involvement in the day-to-day management of the cooperative has limited growth and delayed dividend payments to members and suppliers, acting as serious disincentive to participation.

56 The Amul cooperative involves an estimated 2.7 million farmers in Gujarat and processes 10.2 million liters of milk per day. It is considered by some to be Asia’s biggest dairy business venture.
These shortcomings of cooperatives in many parts of India generated the concept of **mutually aided cooperative societies** (MACS). A MACS Act was enacted\(^{57}\) in 1995 to respond to governance issues related to cooperative organization. The law gives autonomy to district and village cooperatives to set up societies that are profit-making but function like cooperatives in terms of services provided to farmers, without the involvement of state management.

**Collective farms**, such as those in Sichuan province in China, are supported by the township and county governments. Farmers are grouped into a farm model in which all the cows are milked by machine. A local investor/builder constructs the dairy facility, supplying all the capital. After construction, in the Sichuan example, the village director settled the debt with the builder by identifying individual producers to purchase stall space within the barn. While the operation is run by a village committee, individuals own the stall space and assume full management of their cows, including feeding. Milking machines, however, are owned by the company, in the China case, the New Hope Dairy Cattle Company. A member of the collective supervises the milking and keeps records of the amount of milk produced by each cow. A local company collects the milk. One of the obvious constraints to extending this type of operation is geographical access to facilities.

In **milking stations**, similar to the collective farm, operations revolve around the construction of mechanical milking facilities linked to households. However, in this case, the producers bring their dairy cows to the station for milking. In some areas, one milking station services about 200 dairy cow-raising households. The governance of these stations can differ; a processing company owns some of them and leases to the township or the producers, or there are private and cooperative owners. According to Hu (2008), benefits of the stations reduce labour requirements by farmers and ensure the provision of a stable market and access to technical training, while the processors benefit the stable supply of high-quality milk and limited opportunities for milk adulteration.

**Private dairies** reflect one of the numerous opportunities for linking processors to producers. The institutional links with the producers, however, can differ depending on the circumstances. Typically, processing companies procure milk through village agents who have a personal connection with producers. The processor occasionally has direct interaction with the producers; however, usually the milk price is negotiated directly with the agent. This limits price transparency to producers and reduces their market power as well as incentive to provide quality, unadulterated milk. Some processing companies, such as Dutch Lady in Viet Nam, operate a payment scheme that is transparent with various check points, including random individual quality checks. This more direct contact with producers provides incentive for ensuring milk quality at the farm level.

The **contract farming model** is a variation of the private dairy in which producers are given contracts for their milk supply (Halla and Habeel Foods in Pakistan). However, in Pakistan, only 3–5 percent of the total milk production is sold through formal channels. Informal rural or peri-urban-based agents in the marketing chain sell the bulk of the supply.

Farmer-managed **milk collection stations** in some areas of China are preferred to the milking stations owned and managed by processors because farmers are less at risk from monopsony pressures, such as the power of relatively few processors to control prices. In cases such as China, increased competition between processors results in lower prices to producers; management and control of some of the dairy infrastructure provides producers with more market power.

**Dairy development zones** (in the Philippines and China) regroup dairy producers in a designated area, with processors or a local government constructing the infrastructure. Typically the zone requires at least 200–300 cows, with some in China reaching 500–1 000 cows. The advantage of the zones is the technical assistance and supervision that is provided, while the separation between production and residential areas benefits disease control. In the Philippines, many of the zones are public–private partnerships with the National Dairy Authority, which provides development support, while in China financial assistance is available through government supportive policies.

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\(^{57}\) To date, only in Andhra Pradesh.
Joint venture operations (Shanghai area of China) have linked ex-state-owned companies and independent farmers. The company owns the dairy animals typically, with farmers providing the land, labour and cattle barns. The company owns 40 percent of the equity in the farms (and the farmers own the remainder) and provide technical assistance for improving feeding practices and disease control.

Pastoral parks (implemented in Northern China) are suitable in pastoral regions where households with large herds join together with assistance from dairy-processing enterprises or other organizations. In China, the processing company invests in the construction while the households raise the cows. However, other organizational structures are possible, such as a cooperative one where the infrastructure is owned by the households.

Mobile-dispersed milk-collecting systems; for use in geographically dispersed milk production units. Used in the 1980s in China, these units went from household to household with milk-tank trucks. One serious constraint to this model is its inability to guarantee that quality of the raw milk.

State-owned milk processing companies still exist in many countries in Asia. For example, MILCO in Sri Lanka engages in milk collection and largely determines the farmgate milk price – based on its processing and marketing costs, both of which are reputed to be relatively high. The large private firms follow the purchasing price offered by MILCO, although they do pay a premium, depending on the competition in the local market where they operate. Unfortunately, this system limits price increases (even in times of high international prices), thus disadvantaging smallholders who currently supply the majority of milk production.

The pro-poor social/business community dairying model (Bangladesh) adds livestock activities to ongoing community development programmes that provide training, vaccination, veterinary care and other support services to help poor women become dairy farmers and assist others to improve and expand dairy operations. In Bangladesh, project participants have become suppliers of milk to private dairies, including the Grameen Danone yoghurt plant. Today, this programme and others are administered by a not-for-profit organization called the Grameen Motsho O Pashusampad (Fisheries and Livestock) Foundation.

Factors affecting model selection and overall dairy development

While international dairy product prices have declined from their record levels in 2007, the current market environment offers opportunities for dairy development and for smallholder producers, particularly those linked to traditional milk products and fluid milk markets. As retail powder prices increase, fresh liquid milk becomes more competitive. This was evident in most of the case study countries, particularly those where domestic markets were linked to international price fluctuations.

One of the challenges for regional stakeholders is the identification of specific factors that support or fail to support model adoption suitable to smallholder dairy development in a local context. Smallholder participation in markets is influenced economic incentives and shaped by institutional and policy initiatives; as well as by cultural and social practices that allow them to participate in the prospective growth. This could be through increased links with larger operations that are expanding investment in the local markets as prices for imports remain high or through continued participation of smallholders in traditional markets. The following section draws out some basic generalizations from the country case studies.

The economic considerations

- Price fixing, combined with inefficient processing by the leading processors, results in many cases in low profit margins for dairy producers (Sri Lanka). This, combined with a lack of a clear dairy development plan, constrains incentives to invest in or expand dairy operations.

- Investment and promotion of the sector can be supported through favourable tax policies that reduce local income tax or land-use taxation required for production, dairy product processing and feed-processing enterprises (China). In Mongolia, legislation was adjusted so that the VAT (value-added tax) paid by milk processors could be offset against the cost of procuring domestic milk.
• Limits on supply availability (China) often lead to a consolidation in the processing sector. However, once consolidation occurs, increased competition between larger processors leads to a proliferation of product varieties but also occasionally to lower prices paid to producers. Ownership of the chilling facilities by producers could enhance their market power.

• In some countries, such as Pakistan, large-scale dairy processing is only profitable if the company has invested in other lucrative, yet low-cost non-dairy products.

• In some cases, pasteurization and packaging nearly double the price of milk to consumers, thus reducing the farmgate price and limiting consumption among the urban poor. Giving the formal sector the exclusive right to distribute milk and milk products introduces one of the few economies of scale in dairy production, thus imposing a disadvantage on those selling to the traditional sector. Legislation related to milk distribution channels needs to be evaluated in terms of its economic impact on different stakeholders.

• More discerning requirements among modern consumers result in better milk quality and attractive product branding; even the presentation is becoming a prerequisite for modern urban consumers to switch from imported products to milk produced by local smallholders (China, India, Mongolia, Philippines, Viet Nam).

• In most countries of the region, quality-based pricing mechanisms for milk have yet to be implemented. This is despite new technical and cost-effective innovations in electronic milk analysers that can facilitate payment based on quality characteristics.

• The success of smallholder dairy operations and opportunities for scaling up are influenced by the high opportunity cost of labour relative to the farmgate price. In Sri Lanka, the break-even ratio of the farmgate price to wages in 2008 was 1:13, implying that the value of 1 litre of milk sold at the farmgate equated to only one-thirteenth of local wage rates. This discourages intensive dairy farming and should be a critical factor to assess when evaluating opportunities for smallholder engagement in dairying.

• In many countries, dairying holds more favourable economic returns than other agricultural activities. This is the case in China where, in 2007, the net profit from raising one dairy cow was 14 times larger than growing 1 mu of maize and 3.6 times larger than growing 1 mu of potatoes (Hu, 2008).

• To enhance returns to dairy producers, selected smallholders close to likely markets should seek out value-added opportunities, such as with the production of ready-to-drink milk and yoghurts, sweetened condensed milk, indigenous products and also processed cheese for burgeoning fast food outlets, such as pizza and larger restaurants. (China, Mongolia, Philippines).

• Investment needs to be accompanied by technical and management training for entrepreneurial dairy producers. This ensures that each link in the dairy chain is profitable and encourages private sector investment, particularly in dairy development activities focused on smallholders.

• In some countries, such as Mongolia, there are opportunities to expand the export market, particularly by focusing on the country’s unique mare milk-based and camel milk-based functional foods that could be shipped under a “green” ecological generic label.

Institutional considerations

• Commodity or industry institutions and smallholder groups (associations, boards, cooperatives) can play a pivotal role in supporting dairy development (India, Philippines, Mongolia). Careful attention needs to be paid to the role, function and structure of the organization to ensure advocacy for the sector. In Mongolia, the milk processors’ association promotes local milk and generic milk
marketing campaigns. These campaigns fostered a differentiation of local from imported milk useful in promoting domestic milk consumption and production.

• Commercial banks in many countries generally offer loans with a high annual interest rate, making smallholder access to capital difficult. Innovative credit-in-kind systems have proven to be effective in encouraging dairying operations, such as the one in the Philippines in which producers received cows on the condition that some offspring are passed on to other members of the community. Credit and insurance programmes need to consider the barriers to setting up or scaling up and create incentives for interested dairy entrepreneurs. Meanwhile, cooperatives can offer important services that are critical to scaling up smallholder operations. However, if marketing is not a problem, there is usually no need for a cooperative (China, Pakistan, Sri Lanka, Viet Nam).

• Contracting with processors is an alternative institutional arrangement that supports the scaling up of operations among smallholders. In one model in China, producers entered into a five-year contract with processor, with the contract specifying the purchase price, quality standards and associated premium, and the payment schedule. The producers were paid three times a month. The processor transported any amount and quality of milk from the farms to the processing plant.

Socio-cultural-environmental considerations

• Urban populations in countries that were traditionally non-milk drinking and/or lactose intolerant are increasing consumption of ready-to-drink processed and cultured milks (Philippines, Sri Lanka, Thailand, Viet Nam). Consequently, there are new opportunities for sector development even in countries that don’t have a tradition or seem to be less competitive in dairy production.

• Women in many countries do most of the dairy-related activities. For example, in Sri Lanka, women are the majority members of registered dairy cooperatives but they aren’t represented in management or executive committees. This implies that dairy development planning needs to include a gender focus. In Mongolia, households selling milk have estimated average incomes three times higher than the households not selling milk. With 30 percent of dairy households headed by women, this transforms dairy production into an important livelihood opportunity for rural households. Recognizing this, some banks, such as the Grameen Bank in Bangladesh, specifically target the lending programmes, which lend at reduced rates, at women and port households.

Technical considerations

• Smallholders need an accessible and affordable but complete package of support services (animal health, AI, breeding, etc.) to produce milk competitively (Bangladesh, India, Mongolia). Cooperatives provide these services. However, in increasingly competitive market environments, the private sector often collects the milk but doesn’t actively backward invest in dairy development activities. Smaller companies, such as Dutch Lady in Viet Nam, have expanded their competitiveness and operations by providing extension services. Clear economic incentives from the government, through tax rebates or other economic stimulus options, could motivate the private sector to invest in enhancing the on-farm productivity of suppliers.

• Technical know-how and skills delivered through practical and accessible vaccination and outreach training organized by the government are equally important (India, Mongolia). This includes business management skills that are critical to ensuring the development of the dairy activities as a dairy enterprise (Philippines).

• In most countries, simple changes in husbandry practices and the way stock is managed would result in significant improvement in technical efficiency. This includes feeding as well as access to water and simple technologies for cooling animals in tropical climates. Feeding, in particular, is the key to enhanced productivity because feed accounts for up to 70 percent of the cost of milk production.
Breed enhancement also can lead to increased productivity among producers. However, the means of accessing improved animals needs to be considered, both in terms of market distortions (if subsidies are provided) and in terms of private versus public services, such as those for artificial insemination. In many countries, such as Sri Lanka and the Philippines, markets can be created for dairy stock by encouraging the specialization of production (operations focused on breeding). In the Philippines, the National Dairy Authority collaborated with privately owned cattle breeding farmers, linking suitable financing schemes for dairy animal production.

Lack of small-scale cooling and processing units constrain farmers’ opportunity for obtaining higher prices for their milk. In some cases, the units may be available but ownership issues limit the power of the producers to receive a fair price.

The role of government and policies in dairy development

Governments, through policies and programmes, can provide a catalyst to sector development. However, interventions and support have to be carefully orchestrated to ensure balanced growth. In many countries, sector development flourished through a policy of non-involvement by the government in production, processing and marketing. The design of a clear road map for dairy development needs to include incentives for private sector investment.

When undertaking sector planning, it is useful to consider the following:

1. Government investments in large operations usually fail (Pakistan, Philippines, Viet Nam). **Public sector involvement is best restricted** to selected co-financing arrangements and public–private partnerships that encourage private sector investment.

2. **School milk programmes**, when implemented with a focus on smallholders, can support dairy development (as well as generating long-term demand for dairy products (China, Mongolia, Philippines, Thailand). They can, when linked to local milk consumption, support smallholder dairy development. However, they necessitate a long-term financial commitment by (either national or regional) governments (China, Mongolia, Thailand). In most cases, school milk feeding schemes based on imported pre-packed milk have been counter-productive to smallholder dairy development.

3. In China, investments in school milk programmes, financial support for industry expansion and **favourable credit and taxation policies to support breeding stock** purchased by farm households supported a double-digit expansion in milk production over the past decade. The central Government used national debt funds to effectively mobilize resources from banks, with local governments providing tax rebates to assist the sector, particularly with processing.

4. **Working with financial institutions** is a role that governments can take on to ensure accessible credit for smallholders’ housing and livestock needs. Governments should ensure that concessionary loan programmes take into account the prevailing returns and profit margins of smallholder farmers; credit schemes need to be long term to account for the biological nature of the investment. Ideally, an insurance system should accompany the loans to mitigate animal loss risks.

5. Limited **land ownership** constrains the ability of many dairy farmers to grow quality fodder for cattle. Governments should look for innovative ways to support pasture or fodder development and better use of public land. This could include options for leasing communal grazing land or public land.

6. A critical government support to industry development is the **reduction of barriers to trade**, in particular import tariffs on equipment, animals, raw materials and other inputs. In addition, it is important to eliminate subsidies on inputs, including veterinary drugs, vaccines and AI services, to avoid market distortions. The private sector has difficulty engaging in milk collection and processing in areas with low volumes. To resolve this issue, many countries, through private sector or government-supported economic incentives (tax concessions, etc.), have set up **dairy enterprise or development zones** (China, Pakistan, Philippines).
7. **Pricing policies** that fix milk prices based on the cost of production or other calculations can be detrimental to sector development. This includes price setting by national agencies, cooperatives or municipalities (India, Pakistan, Sri Lanka). In some cases, such as Thailand, high administered prices supported industry profitability. However, with the proliferation of bilateral and regional trade agreements and increased market access for dairy products from competitive suppliers, these policies may not be sustainable.

**Conclusions**

There are many successful models, businesses and institutional arrangements in which smallholder milk producers have gained sustainable access to markets and some that are less successful. The challenge is to identify models that allow smallholders to compete with other forms of milk supply, in particular from larger national operations and imports. Selected successful smallholder dairy chain business models in the case study countries presented in this publication include:

1) **Cooperative dairying model**: the world-renowned Anand Pattern model from India and more recent cooperative company models, such as in Bangladesh, India and Thailand.

2) **Contract farming model**: essentially a private sector–smallholder incentive model, such as in Pakistan (Halla and Haleeb models), Sri Lanka and Viet Nam.

3) **China dairy park model**: collective/community dairy cow raising in an investment-driven growth environment.

4) **Philippines dairy zone model**: public–private sector equity partnerships.

5) **Mongolia dairy chain model**: involving six enterprise modules for liquid milk and cheese for each link in the farm-to-consumer food chain.

5) **Bangladesh social and community dairying models**:
   - Grameen Bank poor people’s community livestock and dairying model, part of the environmentally sustainable, integrated crop-fish-livestock model.
   - Bangladesh: Grameen-Danone Foods NGO-private sector social model.

The major factors influencing smallholder dairy chain models drawn from the case studies are summarized as follows:

- Smallholder participation in dairy value chains is straightforward in concept but complex in execution.
- Smallholder milk producers must be competitive to access markets; for example, they must produce top-quality milk at affordable prices. In achieving this status, most subsistence smallholder milk producers have progressed to become small commercial dairy farmers.
- Appropriate technical interventions, either on-farm or post-farm, need to be supported by an enabling environment that is characterized by pro-smallholder policies and institutional support as well as a market structure that ensures fair pricing for quality products.
- A strategy of including smallholders requires a deliberate and creative development vehicle that is sensitive to the impact of policies, programmes and activities to smallholders.
- The private sector must be fully engaged in the development of a dairy strategy and in carrying out the strategy at the country level.
- Smallholder dairy action plans are the vehicles to transform strategies into national action, recognizing that the impact of appropriate policies, programmes and activities depends on the local context and, most importantly, the people involved.

The appropriateness of a specific model is largely contextual. However, in general, smallholder dairy chain models have not been so successful: i) where centrally planned approaches are used; ii) when governments...
intervene by establishing large public sector-managed dairy processing enterprises; iii) where producers have limited leverage over resources or governance of the chain; and iv) where low tariffs facilitated the importation of cheap dairy commodities used as raw materials rather than fresh local milk.

It is important to have the right mix of supporting factors in place to promote smallholder dairying (see the section on dairy policies in the next chapter). An enabling environment is a vital ingredient, with clear, focused and implementable policies and well-thought-out strategies designed to translate policy into bankable output. It is in this context that careful selection of appropriate and contextually designed models need to be considered and evaluated.
Dairy policies and sector planning

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The primary drivers in dairy sector development include changes in demand, advances in production, transportation and communication technology, enhanced on-farm productivity due to improved management, and the expanding scope of dairy product marketing. However, a creative mix of sector policies and programmes that provide an enabling environment for sector development and private sector engagement can favourably influence the rate and shape of growth.

The financial resources commonly deployed by developed countries to support their heavily subsidized dairy industries are not available in developing countries. This absence of significant resources highlights the necessity for forging an enabling environment that is supportive of sector development through carefully crafted and focused policy interventions. These interventions should ensure engagement of the private sector through innovative partnerships, cost-sharing arrangements and meaningful participation of smallholders. In Asia, where the majority of milk is sourced from smallholders with two to five cows, this requires a deliberate and creative development vehicle generated and endorsed through a carefully organized planning process.

This chapter reviews the general guidelines suggested for dairy development planning during an FAO-organized technical meeting in 2008. It includes discussion on possible policy objectives identified during that same meeting and a review of tools and implementing mechanisms that can provide a road map for action. Table 1 outlines the pillars of support for dairy development documented in FAO’s Strategy and Investment Plan for Smallholder Dairy Development in Asia; these include the technical interventions that should enhance capacity and knowledge, productivity and competitiveness, and market access.

Table 1: The pillars supporting dairy development

<table>
<thead>
<tr>
<th>Human resource development and knowledge management</th>
<th>Improving productivity and competitiveness of smallholder milk producers</th>
<th>Strengthening linkages between farmers and consumers to deliver a quality product at a fair prices through:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Skills training</td>
<td>1) “Menu of options” for dairy development models</td>
<td>1) Improving farmer access to marketing channels;</td>
</tr>
<tr>
<td>2) Effective M&amp;E of sectoral development</td>
<td>2) Selecting dairy development models appropriate for local conditions;</td>
<td>2) Strengthening price incentives to deliver quality milk;</td>
</tr>
<tr>
<td>3) Support for regional collaboration in knowledge management through a smallholder dairy network.</td>
<td>3) Assist smallholder dairy sector to compete for resources</td>
<td>3) Creating competitive supply chain conditions;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) Creating fair and transparent pricing systems; diversifying the range of products on offer;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5) Educating consumers on the nutritional benefits of dairy products;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6) Stimulating consumer demand; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7) Reducing loses in the supply chain.</td>
</tr>
</tbody>
</table>

Government & Business Enabling Environment

- Supporting a smallholder inclusive policy framework;
- Creating a legal and regulatory framework conducive for smallholder development;
- Supporting the development of a favourable macro-economic framework.

58 The meeting took place in Bangkok in November 2008 and was attended by approximately 40 experts from the region. Further documentation on the meeting and participants can be found on the APHCA website: http://www.aphca.org/workshops/Dairy_Workshop/Strategy.html. More details can also be found in the workshop publication, “Practical Considerations in Designing Strategies and Policies for Dairy Sector Development”.

59 See website above.
But the identification of specific supportive activities shaping the broader context for intervention should be preceded by a development process that identifies the vision, goals, policy objectives and means of achieving these objectives. While commodity development can occur in a policy vacuum, driven primarily by economic, social and cultural factors, the broader development issues related to balanced growth, in particular smallholder inclusion in the process, and poverty alleviation through dairy development necessitates a very strategic planning process.

Implementing an effective dairy development planning process

Many countries around the region have designed dairy development plans and strategies with many including a dairy focus within a broader livestock sector plan, such as Bangladesh (2007), Nepal (2007), Pakistan (2007) and Sri Lanka (2007). Some had designed dairy-specific plans, including the Philippines (2008) and Assam, India (2008). While some are operational, others, despite good intentions, are not being implemented because of a lack of strategic planning in the development process and a lack of consistent focus on implementation requirements, such as financing.

To provide better policy guidance to governments and dairy stakeholders in the region, participants at the 2008 technical meeting identified the following good practices in sector planning:

1. **A stakeholder driven process** that involves consultation and political dialogue and engagement. The diverse nature of stakeholders along the dairy chain and their differing priorities needs to be considered when identifying and prioritizing strategic goals and objectives for sector development.

2. **The setting of clearly articulated measurable objectives** within the longer-term vision and goals for the sector. While the vision in many countries is focused on the development of an enterprise-based sector, it can also, depending on the context, recognize different production and marketing systems and include a pro-poor focus. Strategic objectives need to be prioritized and identified as those focused on short-term outcomes and those that require long-term planning.

3. **Private sector-led orientation** that encompasses a focus on the entire value chain. This builds private sector buy-in to the process, thus ensuring viability and sustainability. But it also necessitates a good public perspective that draws into the process development priorities such as poverty reduction and environmental sustainability.

4. **Consistency** with previously agreed national plans and policies.

5. **A clear focus on implementation challenges**, with mechanisms built into the process to identify quick wins and to ensure that adequate resources are attached to various objectives. It also builds in a clearly articulated and time-based monitoring and evaluation system.

6. **A recognition that many of the specific solutions to constraints to sector development are outside the mandate of stakeholders**, including policy-makers, in the livestock sector. This includes policies influencing international trade flows, banking regulations, allocation of research and development funds, etc. These policies and regulations need to be analysed in terms of their impact on stakeholders in the dairy sector and advocacy needs to be developed to influence those policies.

Participants in the 2008 technical meeting also devised a generic approach for sector planning (Figure 1). They agreed that broad stakeholder participation, including input from smallholders, was needed to identify a sector vision and goals that are credible and achievable and generate support among the private sector.
A key priority in the strategic planning process is to identify and revisit the opportunities and constraints to implementation. The effectiveness of the plan needs to be linked to a clear recognition of resource availabilities/constraints (both human and financial), to demonstrated stakeholder commitment, particularly on the policy level and by private sector, and to an action plan accompanied by a specific time frame. Under the dynamic efforts of a respected champion\textsuperscript{60}, it needs to be integrated into broader planning initiatives of the government.

\textsuperscript{60} A champion is someone who provides leadership and ownership of the planning process. It can be a person or an institution but should, most likely, be part of the political process.
Box 1: Factors critical to strategy implementation

- A prioritized action plan that clearly articulates responsibilities, time frame and benefits of the plan.
- The plan has to be realistic and practical – not a wish list of programmes and projects.
- Quick wins of the plan are identified and publicized, such as activities that can be successfully implemented in the short term. This could possibly consist of quickly piloted local (rather than national) interventions.
- Champions at different levels. Perhaps the chief champion is the head of a dairy board; she/he must then identify and set up a multisector, multilevel champion network that is characterized by partnership and commitment.

The dos:

- Ensure flexibility to adopt the strategy to changing market conditions. This requires considerable research and understanding of the sector and necessitates a feedback mechanism for stakeholders and an active monitoring and evaluation system.
- The strategy should be widely communicated to the general public, through Web sites and advertising.
- Ensure that an executive summary of the plan is available that includes an assessment of actions to be undertaken, with costs and potential impact (both qualitative and quantitative). This summary should include a comprehensive budget as well as a hypothetical impact analysis of interventions.

The don’ts:

1. Rely only on public sector or individual ownership.
2. Assume that the development of the strategy document is the end of the process.

What can go wrong:

- Changes in the implementation environment, such as a shift in government, changing priorities or loss of a champion.
- Price instability, animal disease, food safety scares that change the competitiveness of the market.
- Policy changes that have a detrimental impact on the sector, such as regional trade agreements, with specific provisions that disadvantage the sector. If, however, the strategy is well developed with strong support by champions, this provides the sector with more leverage in terms of advocacy.

The need for effective monitoring and evaluation:

- A baseline of indicators needs to be set up, generated through the analysis stage of the planning process. Bottom-up monitoring needs to be undertaken, with the specific objective of capturing the impact of interventions.
- Monitoring needs to be undertaken periodically, measuring pre-determined indicators, and should be done at the programme/project level (see Box 2).
- A specific time frame for monitoring needs to be agreed upon and supported by the network of champions.

Policy objectives, the mechanisms for implementation and their impact

Participants along the dairy chain often have conflicting interests and objectives. Consequently, the planning process needs to be supported by considerable knowledge about stakeholder concerns as well as a broad understanding of available tools and their ability to achieve policy objectives.

An assessment of stakeholder priorities generates a series of policy objectives. These are specific statements detailing the desired accomplishments or outcomes of a development plan. Whereas the goal of a dairy development plan might be to “contribute to national economic development by commercially, qualitatively
and competitively developing the dairy sector for employment generation and poverty reduction with the participation of government, cooperatives and private sector” (Nepal, 2007), the development objectives would be more specific.

Specific examples of development objectives for the dairy sector could include: i) a reduction of imports; ii) increasing on-farm productivity and ensuring food safety; iii) enhancing nutritional status of children through milk consumption; iv) raising on-farm incomes; v) reducing post-harvest losses; and vi) ensuring fair prices for quality milk products. The effectiveness of plans that incorporate these types of objectives, assuming the availability of well-designed baseline studies, can be measured. This contrasts to more vaguely worded goal statements, such as enhanced food security, sustainable development, poverty alleviation, etc.

The key distinction: the goal is a statement of intent and an objective describes an achievable and quantifiable target or deliverable. Good objectives should:

- be impact-oriented, measurable, time-defined, specific and practical;
- relate to the expectations and requirements of all major stakeholders;
- cover a balanced variety of expectations – economic, social, cultural and environmental.

When assessing the objectives to be achieved through a dairy plan, the menu of options for implementation or the policy tools/measures need to be considered. In most developed countries, the policy objectives of very complex programmes and plans are quite simple: to support milk producer prices and/or incomes. The mechanisms for achieving these objectives, however, can be extremely diverse, with the selection of policy measures having i) differential impacts on the many stakeholders along a chain; and ii) cost implications, particularly as consumers and the government typically finance these interventions.

**Examples from developed countries: Achieving dairy policy objectives**

Developed countries have a long history of supporting local dairy industries through policy tools that include regulated or administered prices, high tariffs or production controls/quotas, such as those in the EU and Canada that limit production increases. All of these policy interventions are designed to ensure objectives of stable and high producer incomes. The significant support for this sector, relative to other sectors, may be related to the characteristics of the product, such as the perishability of milk and dairy products, seasonable production patterns and need for further processing. In addition, dairy farms in developed countries (and in some developing countries) tend to be less diversified and more dependent on farm income than other farm operations (Economic Research Service, 2004).

**Figure 2: The dairy sector in OECD countries is heavily supported**

![Producer Support Estimates %](image-url)
The larger degree of support can be best assessed through measurements of sector inputs, as calculated by the OECD\(^{61}\) (Figure 2). These producer-support estimates (PSEs) reflect the total value of production from government interventions, such as the use of price supports, trade measures (Tariffs/export subsidies) and more generalized government input, such as direct payments. The total value of support afforded dairy sectors in OECD countries two decades ago totalled almost 40 billion euros, approximately 20 percent of the total agricultural support of 217 billion euros. At that time, the PSE, estimated at 58 percent, exceeded all other commodities except rice (80 percent).

Since then, support has declined, mainly in the EU, which accounted for transfers of almost 20 billion euros to their sector in 1986. OECD estimates for 2006 and 2007 indicated that support dropped to 18 billion euros in 2006 and to only 10 billion euros by 2007. High prices in global markets led to policy changes in the EU, which reduced government support to the sector, particularly with the use of interventions stocks and export subsidies as a means to stabilize prices. As global prices in 2008 move down, this trend of not supporting the sector may reverse itself.

In the EU, government stock-holding linked to dairy export subsidies allows for an assurance of relatively stable prices. However, as the structure of the dairy sector evolves, as milk markets become national in scope (driven by advances in transportation and processing technologies) and as dairy farms become more specialized, the impact and cost of policy tools need to be evaluated against their original objectives.

**The case of North America**

The dairy sector in the United States benefits from policy support through interventions including complicated price supports for milk used for manufactured dairy products, classified prices, marketing orders, income compensation and export subsidies. The Canadian system adds supply management, high tariffs and direct subsidies to producers. In the case of the United States, a study (Economic Research Service, 2004) evaluating the impact of dairy programmes on markets indicated that the effects are modest, and dairy programmes, while increasing costs for consumers and government, had only a limited impact on enhancing long-term viability of the sector or producers.

**Australia’s dairy deregulation process**

In Australia in the late 1990s, the Government and the industry recognized that sector development was constrained by support policies put in place in the 1970s (Harris, 2008). Consequently, an industry reform plan was proposed with the objectives of: i) ensuring competitiveness in international markets; and, ii) avoiding a WTO challenge to the legality of policies. A system of policy measures, such as price pooling and underwriting of guaranteed returns, government controlled marketing arrangements, restrictions on interstate trading of milk and producer-subsidized exports, was abandoned. The consultative process consequently subjected all dairy-supporting policies to a regulatory review process and, eventually with the support of a A$2 billion (US$1.6 billion) industry-restructuring package, moved towards full deregulation of the sector. A clear result of these policy reversals was an increase in the scale and productivity of Australian dairy farms and a more competitive, export-oriented industry.

This cursory review of dairy policies in developed countries shows that sector-specific policy objectives and the measures employed to achieve them need to be clearly formulated and periodically reviewed. As sectors transform and witness structural adjustment in production and marketing systems, this process ensures that policies foster the transformation of the industry. Adhering to decade-long policies can limit the ability of sectors to enhance their competitiveness through restructuring, thus penalizing producers who are innovative at the expense of those who maintain high cost-inefficient operations.

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\(^{61}\) The Organization of Economic Cooperation and Development
Evaluating dairy policy objectives and possible responses in developing countries

Successfully achieving ambitious policy objectives, as in the case of developed countries, can be hugely expensive – depending on how measures and programmes are implemented. In developing countries, given financial constraints, dairy policies that involve direct support to industries are not so prevalent. The nature of government interventions varies significantly across the Asia region, as revealed in the lessons learned studies. There is strong government support in China and Viet Nam, which have used government-financed credit schemes to encourage the distribution of improved breeds. This has had a significant impact on sector development. However, the success stories are complicated and not widespread. The nature of dairy production provides important sources of daily cash and nutrition to a large proportion of rural producers; in addition, the sector offers important opportunities for employment creation in rural communities. This implies that governments need to be careful and strategic in their intervention selection.

Figure 3: Dairy development planning

The Policy Goal: Enhancing livelihood opportunities for the rural poor

Stakeholders along the dairy value chain have very diverse priorities. Table 2 refers to the broad categories of stakeholders; the contextual nature of dairy, particularly in Asia because of its diversity, generates a multitude of different categories of consumers, and producers have different priorities. Whereas a landless owner of a cow in India prioritizes dairy access to milk for his family, a more commercialized farmer in the same region may be concerned about getting a fair price for a quality product.
Table 2: Priority objectives of different stakeholders along the dairy value chain

<table>
<thead>
<tr>
<th>Consumers</th>
<th>Processor</th>
<th>Trader</th>
<th>Producer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe dairy products</td>
<td>Better milk quality</td>
<td>Reduced cost of transport</td>
<td>Access to quality services (either publically or privately provided)</td>
</tr>
<tr>
<td>Product value for money</td>
<td>Increased access to markets (domestic and export)</td>
<td>Minimize competition with imports</td>
<td>Fair pricing for quality products</td>
</tr>
<tr>
<td>Variety of products</td>
<td>Input into policy/advocacy</td>
<td>Input into policy/advocacy</td>
<td>Stable farm income/and reduced income risks</td>
</tr>
<tr>
<td>Nutritional products</td>
<td>Optimizing plant capacity</td>
<td>Expand and diversify operations</td>
<td>Access to milk for home consumption</td>
</tr>
<tr>
<td>Readily available</td>
<td>Stable milk supplies</td>
<td>Stable milk supplies, regular access</td>
<td>Increased productivity of animals</td>
</tr>
<tr>
<td>Properly labelling and packaged</td>
<td>Assured access to quality inputs</td>
<td>More formalized market role</td>
<td>Availability to quality inputs</td>
</tr>
</tbody>
</table>

While there are some commonalities in the objectives of the stakeholders, in many cases the policy instruments used to achieve the objectives can differ in terms of their impact on the stakeholder. For example, a fair price is defined very differently by different stakeholders. Pricing policies that favour one stakeholder over another, such as setting the price of milk without consideration for costs of production for producers, has both short-term implications (farmers will reduce or stop new investments) and long-term impacts (the prices will go up because of supply constraints and shortages of cattle in the long run). This was the case in Pakistan in 2007 when, in the context of rising food price inflation, a milk price ceiling was enforced in Karachi.

The policy instruments

The enabling environment for dairy sector development, particularly one focused on scaling up operations, hinges on clearly articulating policy objectives and on identifying the appropriate tools for achieving them. In developed countries, the use of certain policy instruments has had a differential impact on different stakeholders. Direct support to producers involves government/taxpayer costs, high tariffs on imports raise costs to consumers and supply restrictions limit industries’ ability to respond to changing global demand for dairy products. Similarly, the Karachi case highlights the importance that decisions by governments, in particular the choice of measures or tools that they use to achieve their sector objectives, be implemented with a broader understanding of their direct and indirect impact on stakeholders.

Policy measures can be broken down into three broad groupings: i) those that require legislation and regulatory follow-up; ii) those that facilitate institutional strengthening. These include the development of commodity associations or boards, targeted grants for research and development, facilitation of credit to dairy chain stakeholders, etc. And iii) those that are classified as market-based incentives provided by government through public–private partnerships. These could include government-financed grants for private sector research, pro-poor start-up costs for private sector veterinarians interested in working in remote areas, and co-financing of animal insurance schemes.

62 A board is occasionally a parastatal organization linked to government that assumes some type of regulatory, oversight role in industry development whereas a commodity association is more representative of broader stakeholder interests and serves more of an advocacy role for the sector. The establishment of commodity bodies requires a clear legal basis recognizing their existence, role and authority.
A review of possible measures for achieving policy objectives is presented in Table 3. While mainly illustrative and not comprehensive, the table includes possible policy measures as options for achieving the objectives identified by workshop participants as supportive of sector development. The table reveals that some policy instruments are more favourable to the interests of various stakeholders. For examples, food safety or quality legislation that sets milk hygiene standards, which are enforced by ordinances and regulatory inspection at the level of plants and traders, is favourable for consumers concerned about food

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### Table 3: Linking policy instruments to direct impact\(^{63}\) on various chain stakeholder

<table>
<thead>
<tr>
<th>Policy instruments/impact on</th>
<th>Consumers</th>
<th>Processors</th>
<th>Traders</th>
<th>Producers</th>
<th>Controlled by livestock stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food safety/quality legislation</td>
<td>++</td>
<td>+/x</td>
<td>?</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Dairy product hygiene</td>
<td>++</td>
<td>+/x</td>
<td>?</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Feed safety</td>
<td>+</td>
<td>+/x</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Labelling/packing regulations (which includes product definitions)</td>
<td>++</td>
<td>+/x</td>
<td>x/+</td>
<td>–</td>
<td>No</td>
</tr>
<tr>
<td>Licensing (plants, traders)</td>
<td>–</td>
<td>+/x</td>
<td>x/+</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Certification of product standards (such as HACCP)</td>
<td>+/x</td>
<td>x/+</td>
<td>–</td>
<td>–</td>
<td>No</td>
</tr>
</tbody>
</table>

#### Trade legislation

<table>
<thead>
<tr>
<th>Policy instruments/impact on</th>
<th>Consumers</th>
<th>Processors</th>
<th>Traders</th>
<th>Producers</th>
<th>Controlled by livestock stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition policies (anti-monopoly rules)</td>
<td>–</td>
<td>+/x</td>
<td>?</td>
<td>?</td>
<td>No</td>
</tr>
<tr>
<td>Tariffs on dairy products (lower)</td>
<td>++</td>
<td>x/+</td>
<td>x</td>
<td>x</td>
<td>No</td>
</tr>
<tr>
<td>Tariffs on inputs (lower)</td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Special safeguard mechanisms</td>
<td>x</td>
<td>+/x</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
</tbody>
</table>

#### Other legislation

<table>
<thead>
<tr>
<th>Policy instruments/impact on</th>
<th>Consumers</th>
<th>Processors</th>
<th>Traders</th>
<th>Producers</th>
<th>Controlled by livestock stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restrictions on inter-regional trade</td>
<td>x</td>
<td>x</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Tax rebates/credits on investment (foreign/domestic)</td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Subsidies on inputs, other factors of production</td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Land tenure, access to water and other resources</td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Food vouchers for the poor</td>
<td>++</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>No</td>
</tr>
<tr>
<td>Legal recognition of supply/marketing contracts</td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Legal recognition of commodity associations</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Decentralization of livestock services</td>
<td>–</td>
<td>+/x</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
</tbody>
</table>

#### Institutional support

<table>
<thead>
<tr>
<th>Policy instruments/impact on</th>
<th>Consumers</th>
<th>Processors</th>
<th>Traders</th>
<th>Producers</th>
<th>Controlled by livestock stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade/export facilitation</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>Cost-sharing on generic promotion of milk</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
<tr>
<td>Credit guarantees for market participants</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Research and development; this could include one-off grants to private sector</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Establishment of commodity bodies</td>
<td>–</td>
<td>x</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Financial support to school milk programmes</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### Market-based incentives provided by government

<table>
<thead>
<tr>
<th>Policy instruments/impact on</th>
<th>Consumers</th>
<th>Processors</th>
<th>Traders</th>
<th>Producers</th>
<th>Controlled by livestock stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax credits/or concessional payments to processors/private sector for services provided by in the areas of: 1. extension 2. artificial insemination 3. animal insurance 4. establishment of milk traceability systems</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>No</td>
</tr>
<tr>
<td>Government-financed start-up grants for private veterinary practices in rural areas.</td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>Yes</td>
</tr>
</tbody>
</table>

\(^{63}\) ‘To affect or influence, especially in a significant or undesirable manner’; some interventions can have indirect impacts as the policy feeds through the chain, particularly through impact on prices. However, this table addresses the direct impact of the policy measure.
safety of milk products. However, for poor consumers, both in urban areas and those consuming raw milk supplied by traditional markets in rural areas, legislation and the way that it is enforced could have a negative impact on incomes (as milk becomes more expensive because of higher processing costs) and nutrition (if milk becomes less accessible).

Similarly, the impact of this food safety legislation example will have differential impact on processors, assuming that the larger ones who have higher standards will be impacted differently than those who have higher relative costs of compliance to ensure adherence to the new standards. In fact, as indicated in studies in the United States, the introduction and enforcement of higher standards (such as making Hazard Analysis and Critical Control Points-HACCP, mandatory) potentially leads to a consolidation of the industry as smaller firms opt to sell their operations to those with larger operations and larger economies of scale.

Policy responses that seek to control markets through ceiling prices, forcible procurement or direct government involvement in production or marketing activities (in order to ensure food security and access to food) will, in most cases, lower prices and constrain potential output gains. And thus, they will adversely affect producers’ livelihoods. Any policy instrument that affects price levels along the chain, from retail price ceilings to supply management systems in Canada and those that link producer prices to the costs of production, have ripple affects along the dairy value chain and affect the long term competitiveness and viability of the industry.

It is also clear that the key role played by government is mainly legislative and regulatory, although government can strategically engage the private sector in market-based solutions that are tailored as a cost-effective alternatives or complements to legislation. Constructively engaging the private sector early in the process through the provision of attractive financial incentives, such as tax rebates and cost-sharing arrangements, is crucial for ensuring the development of the sector. Government should be aware of the private sector’s role in addressing many of the problems affecting efficiencies of dairy chains. Supportive private services include targeted extension, animal health, AI services, the facilitation of chain-based financing/credit guarantee schemes, the establishment of traceability and quality assurance services, etc.
Box 2: “The score card” approach
A monitoring and evaluation system
for the Philippines’ dairy development programme

Sally Bulatao, Former Chairperson, National Dairy Authority

Monitoring and evaluation (M&E) systems identify the efficiency and effectiveness of a project or a programme. The National Dairy Authority (NDA) of the Philippines adapted a “score card” approach in which there are monthly reports on indicators that address final outputs (milk production, number of dairy animals, etc.) as well as measures of performance based on the Dairy Development Plan (breeding and calving numbers, volume of milk processed, milk sales, etc.).

Together with the managers and technical people in the National Dairy Authority, indicators were identified that best capture the results of operations. The indicators had to correspond to the main programme components: herd build-up, business enhancement, quality assurance and school milk provision. The final score card had to fit one page to be readily available for public use. Each of the indicators on the final score card has corresponding subindicators monitored at the field offices. For example, milk production for the month would be on the final one-page score card, but this indicator is supported by subindicators of milk production in different types of farms and linked to areas covered by assigned extension workers.

The M&E system aims to help the agency: i) review progress; ii) identify problems and causes of slack in achieving targets; and iii) make necessary adjustments as needed by resource availability and ground-level feasibility of planned activities. Annual targets are set in a year-end planning conference and reviewed in a mid-year planning meeting. Based on the unit scores, the NDA presents its top-ten achievements in its annual report. Other achievements at the field level are documented in each programme, such as keeping the number of non-milking animals low, ensuring timely payment of animal loans, increasing the number of children covered by the school milk provision through contracts with local governments. On an annual basis, the benefits realized per peso of government funds invested in dairy development are reported.

The subelements of the programme components generate the achieved dynamism. For example, while herd build-up is a mainstay component of the dairy programme, the subprogrammes that tailor animal loans to the industry context drive better performance. One example is the Save-the-Herd (STH) Programme to save dairy animals from being sold outside the dairy zone. This allows dairy farmers who want to sell their animals to pass on the animal to another dairy farmer who enters into a caretaker arrangement with the cooperative or an NDA field office. In the monitoring system, the number of animals under the STH is tracked.

While having consistent programme components, the dairy plan is subject to performance checks through the score card so that annual adjustments may be made to ensure reality-based goals. This process spurs the conceptualizing, designing and packaging of better targeted activities.
Conclusions

Despite declines in 2008, dairy prices remain higher than historical levels. This has induced renewed interest in dairy development in the Asia, particularly in recognition of the nutritional and livelihood importance of milk in rural communities. Nearly 80 percent of the 247 million tonnes produced in Asia in 2007 was supplied by smallholders.

The test for stakeholders in the region is to foster sector growth, one that is inclusive of smallholders, through the development of an enabling environment. This requires generating a sector-planning process that provides a road map for sector development that has buy-in from the private sector and is representative of the priority concerns of stakeholders, large and small.

Most of the policy measures that could support dairy development are not under the control of a ministry or department of livestock. Rather, they are the responsibilities of other ministries, such as commerce, trade, heath or industry. This implies that in the development planning process, other stakeholders need to be brought early on into the planning process. As well, a host of other considerations need to play into the decisions on how to support sector development. While socio-equity issues can be reviewed, recognizing that there is a diverse set of consumers and producers, the impact of policies on the environment also needs to be considered.

The challenge is to translate the planning process and final strategy document into a vehicle for action. This requires a comprehensive process that explicitly relates implementation modalities to clear action plans with identified responsibilities of selected champions. The more difficult challenge is to identify policy measures that can effectively respond to policy objectives. Limited by financial constraints, dairy stakeholders need to critically evaluate the potential impact (both human and economic) of policy combinations to determine which are acceptable along the chain – while recognizing the overall vision for sector development. Private sector engagement and endorsement of the process is one of the essential ingredients for success in this process.