Developing an Asian regional strategy for sustainable smallholder dairy development

PROCEEDINGS OF AN FAO/APHCA/CFC-FUNDED WORKSHOP

25-29 February 2008
Chiang Mai, Thailand

OBJECTIVE OF THE WORKSHOP
“A regional strategy for dairy development that is a deliberate and creative development vehicle that is sensitive to the impact of policies, programs and activities on smallholders”
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Regional Office for Asia and the Pacific
Food and Agriculture Organization of the United Nations
Bangkok, 2008
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Edited by Nancy Morgan, Livestock Policy Officer, Regional Office, Bangkok

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Foreword

Rising commodity prices around the global are providing a backdrop against which investment in agriculture in developing countries is more conducive than ever before. The dairy sector is no exception; in fact, dairy prices, starting in late 2006, were among the first commodity prices to rise and the structural factors underpinning these increases, in particular the elimination of export subsidies, will maintain prices at relatively high levels over the medium term. Consequently, it is an opportune time to organize this workshop which focuses on the development of a regional strategy for smallholder dairy development.

In anticipation of generating guidance on best practices in sustainable smallholder dairy development that feed into the development of an effective strategy, lessons learned in the region need to be reviewed and analyzed. These lessons need to identify possibilities for increasing productivity, scaling up and/or replication of specific models and to identify specific entry points for the various stakeholders, whether they be producers, processors, policy-makers, or donors.

Both FAO and the Animal Production and Health Commission for Asia and the Pacific (APHCA) have a long standing commitment to smallholder dairy development and aim to provide regional guidance to stakeholders, through the identification of contextually “appropriate” policies, programmes and activities on sustainable development of smallholder dairy sectors. The organization of this workshop, financed partly by the Common Fund for Commodities (CFC), which combined the considerable expertise of over 50 experts from 17 countries around the region, shaped the regional strategy and investment plan for smallholder dairy development.

The approach for the strategy development process needed to be practical, based on lessons and input from the region, bankable and actionable; a roadmap enabling localized, targeted and tailored investment approaches. It needed to be a two-tiered and dual approach, emphasizing the importance of regional knowledge networking and resource mobilization that feed into national and localized intervention, while distinguishing between immediate and medium-term action.

The following document highlights the process and supportive information generated to craft the regional strategy. It is our hope that the information in the proceedings and the investment opportunities outlined in the strategy framework itself, which was finalized subsequently to the workshop, will set the stage for looking forward in terms of resource mobilization for the sector.

He Changchui
Assistant Director-General and
FAO Regional Representative for Asia and the Pacific
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Introduction and background to the workshop

Nancy Morgan, Livestock Policy Officer, FAO, Bangkok

The context

Dairy consumption in Asia and the Pacific has more than doubled in twenty-five years, rising 4 percent annually to reach an estimated 248 million tones in 2008, more than one third of global totals. Nearly four-fifths of these gains have been in South Asia which accounts for 60 percent of the region’s bovine and ovine populations and for 20 percent of global milk consumption.

In 2006, a possible long-term structural adjustment in international dairy markets shocked market participants. This adjustment was characterized by tight global supplies and high prices as a result of the elimination of EU export subsidies for dairy products. Combined with long-term drought in Australia and a potential long-term investment slow down in that industry, these developments hold unprecedented opportunities for smallholder dairy operations in many developing countries. This is particularly true in Asia, where over 80 percent of dairy animals are raised by backyard or small-scale farmers who are a critical and unique ingredient in the region’s ability to maintain robust gains in milk production.

Local responses to growing consumption needs

Translating into opportunities for local producers, strong consumption gains in Asia over the past 10 years have supported the dairy sector. In fact, production gains in Asia have accounted for nearly 60 percent of global totals over the past decade. Growing demand by both urban and rural consumers in South Asia, a region of strong dairy traditions, was supplied by smallholders holding 2-5 cows; these are the producers who reputedly account for nearly 80 percent of regional milk production.

Characterized by a long historical tradition of both urban and rural milk consumption accompanied by strong informal rural milk market systems, consumers in South Asia consume nearly 60 kg/caput/annually (compared to the 96 kg/global average). However, the explosion in consumer acceptance of dairy products over the past decade has been in East and South East Asia where per capita consumption levels are generally one-third the levels of South Asia.
International milk powder prices move to unprecedented levels.

Asian Dairy Imports % Consumption

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>537</td>
<td>1,800</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>577</td>
<td>1,400</td>
<td>45</td>
<td>67</td>
</tr>
<tr>
<td>Philippines</td>
<td>1,251</td>
<td>1,400</td>
<td>99</td>
<td>112</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1,232</td>
<td>1,100</td>
<td>107</td>
<td>128</td>
</tr>
<tr>
<td>Japan</td>
<td>1,631</td>
<td>1,400</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Thailand</td>
<td>1,131</td>
<td>800</td>
<td>80</td>
<td>63</td>
</tr>
<tr>
<td>Singapore</td>
<td>720</td>
<td>900</td>
<td>175</td>
<td>77</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>247</td>
<td>604</td>
<td>78</td>
<td>70</td>
</tr>
<tr>
<td>Korea Rep. of</td>
<td>310</td>
<td>800</td>
<td>13</td>
<td>27</td>
</tr>
<tr>
<td>Total ASIA</td>
<td>14,018</td>
<td>17,500</td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>

Coming from a low base characterized by low traditional preferences for fluid milk, double digit consumption gains in have been witnessed in countries like China and Viet Nam. These gains have been fuelled by growing incomes, changing diets and demographic trends which favor more western diets and strong generic promotion of milk products, including the promotion of school milk programmes.

The role of imports in supplying local consumption

Asian, a region where GDP growth is estimated at 5-6 percent annually, constitutes an important market for the major dairy exporters, dominated by New Zealand, the EU, Australia, the US, and increasingly Argentina. While the region’s dairy product imports, particularly those of milk powder, have nearly doubled over the period, from 10 to an estimated of 17.5 million tones in 2008, the import dependency of the region has remained stable at nearly 9 percent. However, higher dairy product prices in 2007 and 2008 have pushed up import prices and FAO recently estimated that dairy product imports by developing countries will reach nearly US$25 billion in 2008. This is fuelled by a two-thirds increase in import prices and, in combination with escalating prices for basic food stuffs such as maize, rice, and vegetable oils, raises regional concerns about food security.

Regional averages, however, tend to mask local realities and, in fact, while dairy product imports by South Asia, limited by strong consumers preferences for fresh milk, availabilities of local product and barriers to imports, constitute only 1 percent of domestic consumption, imported milk products into the South East Asian region supply nearly one-quarter of domestic requirements. When calculating dairy imports as a share of processed milk, this share jumps to over 90 percent in some countries.

In fact, Asia imports constitute more than half of global totals in milk products, and in countries like Sri Lanka, the Philippines, and Viet Nam, where tariff levels are very low and consumers are familiar with and favor reconstituted milk products, import dependency has reached over 80 percent. In China, a country which has witnessed double-digit consumption gains over the past decade, imports constitute only 6 percent of total consumption. However, with imports estimated at nearly 2 million tonnes, China constitutes the largest dairy product importer in the world, followed by Mexico, Russia, Egypt, Indonesia, Malaysia and the Philippines.
The opportunity ……

International market prices of dairy products, rising well over twice their levels of one year ago, hold considerable opportunities for future dairy development in Asia. While prices of internationally traded milk powder are expected to gradually subside from their historical peak of near US$5,000/tonne in late 2007, the perceived competitiveness of large holder dairies heavily reliant on increasingly higher priced imported inputs is expected to erode. Increasingly large processors in the region are gravitating towards local suppliers of fresh milk, and in many regions, this implies stronger institutional linkages with smallholder producers, the characteristics of which differ by country and by local conditions within countries.

In some countries, depending on their linkages with international markets and the substitutability of fluid milk with reconstituted/UHT milk, domestic prices have been rising. This affords interesting opportunities for local dairy development. In some countries, however, smallholder participation has been constrained by government administered pricing schemes for milk and/or strong monopoloy power by processors and/or collusion in price setting.

<table>
<thead>
<tr>
<th></th>
<th>Units</th>
<th>Oct-06</th>
<th>Dec-07</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMP (NZ)</td>
<td>tonne</td>
<td>2263</td>
<td>4400</td>
<td>94%</td>
</tr>
<tr>
<td>SMP (Phil)</td>
<td>25kg bag</td>
<td>2,300</td>
<td>6,200</td>
<td>170%</td>
</tr>
<tr>
<td>Fluid Milk (Sri Lanka)</td>
<td>liter</td>
<td>22.00</td>
<td>27.50</td>
<td>25%</td>
</tr>
<tr>
<td>Fluid Milk (Vietnam)</td>
<td>liter</td>
<td>3600</td>
<td>6100</td>
<td>69%</td>
</tr>
</tbody>
</table>

The challenges…….

To ensure broader stakeholder engagement in current market opportunities for dairy, it is clear that the opportunities for smallholder dairy producers can only be understood within the wide range of influencing factors: economic, institutional, commercial, legal, technological and social. However, effective strategies for enhancing the contribution by smallholders to growing livestock product demand is complicated by the fact that the specific constraints/opportunities facing the sector differ not only by country but by specific localities.

Consequently, useful models of small and large-holder milk producers, which are characterized by the specific linkages within the value chain, need to be reviewed and analyzed. It is particularly important that the enabling factors which are critical in successfully forging linkages between smallholder suppliers, processing facilities and traditional markets for fluid milk and other locally acceptable dairy products be identified, weighted and ranked. The selection and promotion of acceptable models need to be based on local conditions, market access, cultural factors and consumption patterns. These models could range from enterprise-driven smallholder dairy operations in the Philippines and Vietnam, to cooperative development in South Asia, to strengthening opportunities for subsistence farmers in Bangladesh.

The workshop

Responding to the urgent need to stimulate investment opportunities for smallholder dairy producers in Asia, the Animal Production and Health Commission of Asia and the Pacific (APHCA), FAO, and the Common Fund for Commodities (CFC), organized a workshop1 on smallholder dairy development in Chiang Mai, Thailand from February 26-29th, 2008.

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1 For more information on the project interested readers can visit the APHCA website at http://www.aphca.org/reference/dairy/dairy.html. The workshop agenda, opening statements and the list of participants are attached as Annexes 1, 2, 3.
Representing 17 countries in the region, approximately 50 participants representing national government agencies, cooperative societies, dairy industry groups, independent research institutions, private companies and consulting firms and private sector dairy producers participated in the 4-day workshop.

| Afghanistan | Indonesia | Myanmar | Samoa |
| Bangladesh | Iran | Nepal | Sri Lanka |
| Bhutan | Malaysia | Pakistan | Thailand |
| China | Mongolia | Philippines | Vietnam |
| India | | | |

The objective of the organizers of the workshop, with the assistance of the regional stakeholders, was to develop a dairy strategy which:

a. is recognized and endorsed by donors/policy makers as a regional and “actionable roadmap” to action on smallholder dairy development;

b. leads into a regional network on smallholder dairy development which provides best practices, guidance to regional stakeholders; and,

c. generates commitment by governments/industries to work within the network to prepare national action plans on dairy development.

The workshop was opened by Dr. Hans Wagner, FAO’s Senior Animal Production and Health Officer in Asia and Secretary of APHCA. He welcomed all the participants on behalf of APHCA and briefly outlined the expectations of the workshop. He also expressed appreciation to Dr. Sakchai Sriboonsue, the Director General, Department of Livestock Development who participated in the opening ceremony as well as Francesco Gibbi, the representative of the CFC, who reaffirmed the commitment of the CFC to dairy development in the region.

Mirroring the five main elements of strategy development depicted in the diagram above, the workshop structure moved from identifying trends/development in the region to brainstorming sessions which laid the groundwork for an “actionable, bankable” regional strategy for dairy development. Session 1 of the workshop reviewed the dairy environment in Asia through country specific background papers. In particular, general lessons from 9 FAO-commissioned “lessons learned case studies” were reviewed in a context of general dairy development trends, both globally and regionally. Specific results from three detailed value chains studies (India, Viet Nam, Philippines) were presented, followed by an overview of smallholder dairy development in Bangladesh and Mongolia (drawing similarities in the two countries despite the disparities in climate and resource bases), followed by an overview of dairy development in China, one of the fastest growing dairy markets in the world.

To better understand the competitive factors affecting smallholders’ ability to compete in markets which are increasingly characterised by competition with larger operations and processors, who have over the past decade relied heavily on imported milk powders, FAO presented a competitiveness
framework for the smallholder dairy sector. This framework, tested in the three value chain case studies, reviews and analyses the related ability of value chain participants to respond to market opportunities, upgrade to meet new market requirements, address challenges posed by international competition, and to provide sustainable livelihoods to value chain participants through the competitiveness of the smallholder dairy enterprise.

Subsequently, workshop participants, in Session 2, 3, 4, and 5, through a process of group work and plenary sessions, defined the vision, mission and objectives of the dairy sector strategic plan, and identified key issues, options, and priority interventions which were placed in the context of a draft strategy logframe. The final regional strategy for smallholder dairy development can be found at the following website: http://www.aphca.org/reference/dairy/dairy.html.
Theme 1: Past experience and learning from successful and unsuccessful smallholder dairying initiatives

Smallholder dairying in the Asia-Pacific region
Based on synthesis of nine country lessons learned studies from Bangladesh, China, India, Mongolia, Pakistan the Philippines, Sri Lanka, Thailand and Viet Nam

Brian Dugdill, Dairy Development Specialist, FAO
Nancy Morgan, Livestock Policy Officer, FAO, Bangkok

Dairying is practiced by millions of dairy operators – smallholders and small traders – in many of the countries of the Asia-Pacific region, where milk and dairy products often fulfill important cultural and social functions as well as providing nutritional and economic benefits. Over the past two decades most countries in the region have been implementing economic reforms, leading to rapid growth and increasing urbanisation. The adoption of market liberalization policies, in addition to heavy farm subsidies in the industrialised countries, has resulted in the domestic markets of some countries in the region becoming increasingly dependent on highly competitive, but increasingly volatile global dairy commodity markets.

Dairying represents one of the fastest returns for livestock keepers in the developing world. It provides regular returns to farmers, especially to women, enhances household nutrition and food security and creates off-farm employment – as many as one job for each 20 litres of milk processed and marketed\(^2\). The highest growth in demand for milk and dairy products has been, and continues to be, in the Asia-Pacific region where dairy consumption has doubled since 1980, contributing more than 60 percent of global consumption gains. Though consumption has grown 4 percent annually, gains have been uneven across the region. Local production has not kept pace with demand and imports continue to grow.

The price of internationally traded food staples increased significantly in 2007, i.e. since the project was formulated. Of all the staple foods, dairy prices grew the most with full cream milk powder and skimmed milk powder more than doubling to over USD 4,000 per metric tonne, or about 50 US cents per litre of liquid milk equivalent. It is clear is that consumer prices are also increasing; what is not so clear is how the dairy industries in the region, and smallholders in particular, are responding to the unprecedented opportunity of better milk prices. Innovative strategies and conducive policies will most certainly be needed to enhance the competitiveness and market access of smallholder milk producers to take advantage of the new market situation.

http://www.fao.org/catalog/bulletin/07_04.htm
The project

There are successful models where smallholder milk producers have gained sustainable access to markets, and some not-so-successful models. Given the current opportunities for dairying in Asia, the Animal Production and Health Commission for Asia (APHCA) asked FAO to develop a dairy development strategy for the Asia-Pacific region to lift the involvement of smallholder dairy farmers. The Common Fund for Commodities (CFC) agreed to fund a fast track project to develop the strategy. FAO is also providing funding from its regular programme budget.

The project started in June 2007 and will be completed in March 2008. The expected project results include: (i) a regional smallholder dairy development strategy for the Asia-Pacific Region (Asia DDS) and (ii) individual action plans for APHCA member countries, which promote the efficient and profitable involvement of smallholder milk producers in national dairy industries. More detailed information about the project and the workshop may be found in Opening Session 1 paper: The Project, the Context and the Workshop and the background APHCA Brief on Smallholder Dairy Development.

The project team has adopted a three-phased approach to implement the project:

1) **Phase 1 (July-September 2007):** Nine rapid country lessons learned studies (LLS) in Bangladesh, China, India, Mongolia, Pakistan, Philippines, Sri Lanka, Thailand and Viet Nam

2) **Phase 2 (October-February 2007):** Based on the outcome of the rapid studies, three in-depth value chain analysis studies in India, the Philippines and Viet Nam.

3) **Phase 3 (February-March 2008):** A regional workshop to outline the strategy and country action plans, immediately followed by detailed finalisation of the strategy and the action plans.

This paper aims to set the scene for the workshop by providing an overview of the nine studies prepared under the first phase of the project. The paper draws largely on the interim project report submitted to APHCA members at the 31st annual session held at Yangon in Myanmar from 29 October to 01 November, 2007, when the project implementation approach was endorsed. The phase 2 Value Chain Analysis studies are covered in other workshop papers and presentations, where specific linkages in the smallholder dairy value chain will be analysed.

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Country lessons learned studies

The aim of the studies was: to identify models and factors that have influenced smallholder participation in dairy food chains – good and bad. They were produced by experienced national experts with hands-on dairying experience from the public, private and NGO sectors. To foster understanding and analysis, generic terms such as: (i) smallholder milk producer, (ii) small dairy farmer, (iii) informal and formal dairy markets and (iv) dairy value chains are defined in each study. The nine study countries have respectively, 65 percent, 85 percent and 29 percent of the Asia-Pacific regions cows, milk production and imports. The study countries represent three broad categories of smallholder access to dairy markets as indicated below.

1) **Good access**: where smallholders milk producers have remunerative access to formal as well as informal milk markets (China, India, Thailand)
2) **Limited access**: where smallholder milk producers generally lack remunerative market access to formal markets, but where informal markets flourish (Bangladesh, Mongolia, Pakistan)
3) **Marginal access**: countries where smallholders contribute little or no milk to formal and informal markets (Philippines, Sri Lanka, Viet Nam)

Smallholder milk producer inclusive models

The more successful initiatives and models (best practices) identified in the studies are listed below. Three are looked at and analysed in more detail under the value chain analyses. While the models are grouped under six broad headings, each country mentioned has, of course, adapted the model to suit its own local needs. A seventh model adds school milk to existing models.
1) Cooperative dairying model:
   - Bangladesh: Milk Vita 2-tier cooperative model (Bangladesh Milk Producers Cooperative Union Limited)
   - India: world renowned Anand pattern 3-tier cooperative model and more recent cooperative company (guided by National Dairy Development Board)
   - Sri Lanka: Milco (Government-owned)
   - Thailand: various milk collecting and processing cooperatives

2) Dairy zone model (public-private sector equity partnership):
   - Philippines: National Dairy Authority

3) Chinese dairy park models (collective/community dairy cow keeping):
   - Nestle: Heilongjiang Province
   - Dairy parks: Inner Mongolian Autonomous Region (Yili and Mengniu Dairy companies)
   - Silver Bridge: producer associations
   - New Hope Group: Sichuan Province

4) Contract farming model (private sector-smallholder incentive):
   - Pakistan: Halla model
   - Pakistan: Haleeb Foods Limited
   - Sri Lanka: Nestle (purchased National Milk Board marketing operations)
   - Viet Nam: Nestle Ha-Tay scheme

5) Mongolia Dairy chain models (comprising six cow to consumer modules for liquid milk and cheese):
   - milk producer orgs, (ii) dairy service centres, (iii) milk collection units, (iv) milk cooling centres, (v) milk processing units and (vi) milk sales centres.

6) Social/community dairying model:
   - Bangladesh: Community Livestock and Dairy Development Project model (Grameen Bank/Grameen Fisheries and Livestock Foundation)
   - Bangladesh: Grameen-Danone Foods social model

7) School milk programme:
   - Where local school milk programmes feature strongly in the above models (Mongolia, Philippines, Thailand)

Which models and interventions did not perform well or were not supportive of smallholder dairy development initiatives?

1) Centrally planned models and models where the Government intervened in milk pricing did not fair well in the longer term run (Pakistan, Viet Nam)

2) By and large government-owned dairies, especially large-scale ones where civil servants were deputed to run the business did not do well (Bangladesh, Pakistan, Viet Nam). Exceptions to this are the newer business model of centrally–owned, but market-oriented dairy companies (China).
3) Initially the private sector wanted to maximize profits and reduce risks by using cheap imported (subsidized) dairy commodities rather than setting up difficult to manage, local milk procurement systems. While the private sector is more nimble and less constrained by regulation, than for example, cooperative models, they were not fully engaged soon enough by interventions targeting smallholder milk producers. However, most of today’s successfully models are private sector-based models.

Key lessons

To facilitate comparative analysis of the lessons drawn from the studies that are inclusive and exclusive of smallholder milk producers, five influencing factors were used, namely: (i) economic (ii) institutional (iii) role of Government (iv) socio-cultural-environment and (v) technical. For the purposes of this paper, the key lessons are grouped according to whether they are mainly influenced by: (i) the private sector or (ii) the public sector. Of course, some lessons embrace public and private sector experiences as well as those from the NGO sector.

Three lessons related to the public sector:

1) **Governments** need to be cautious about interventions in the sector, especially pricing policies (Sri Lanka, Thailand, Sri Lanka) and dairy cow loan schemes (Bangladesh, Mongolia, Viet Nam)

2) **Government investment** in large state-run processing does not work (Pakistan, Philippines) and it is recognized that smallholder dairy development needs to be target based on selected criteria (Bangladesh, India, Mongolia, Philippines, Viet Nam)

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

Three lessons related to the private sector:

1) **The private sector was not engaged soon enough**: creative and carefully thought out linkages by smallholders/smallholder groups with the private sector (including technical assistance, financial support) can enable smallholders to move up the marketing chain (Viet Nam, Bangladesh, Mongolia, Philippines, Pakistan).

2) **Milk quality and attractive product branding/presentation**: are pre-requisites for persuading modern urban consumers to switch from imports to milk produced by local smallholders (China, India, Mongolia, Philippines)

3) **Value addition**: to enhance returns to dairying, selected smallholders close both formal and informal markets should go into high value added ready-to-drink indigenous and niche products (China, Mongolia, Philippines)

Three key lessons applying across the dairy sector as a whole, including NGOs and international donors:

1) **Support services**: Smallholders need an accessible and affordable complete package of support services (animal health, AI/breeding etc) to produce milk competitively (Bangladesh, India, Mongolia). Not surprisingly, in those countries were dairy has no been a traditional agricultural activity, the key constraints are lack of; (i) feed and fodder, (ii) dairy breeding stock and (iii) training (Sri Lanka, Viet Nam Bangladesh) Technical know-how and skills delivered through vocational and outreach training are equally important (India, Mongolia). Industry institutions (Dairy Boards, Authorities, Associations) and smallholder dairy groups (associations, cooperatives etc) can have a pivotal role in supporting dairy development (India, Mongolia, Philippines).

2) **Pro-poor or social smallholder dairying**: The well-known but still important socio-economic-cultural-environment benefits of smallholder dairying are: (i) improved household nutrition and food security, (ii) higher incomes, (iii) more jobs, as part of mixed and integrated farming
systems to spread risks and sustain the environment (all countries). Pro-poor social programmes, including school milk programmes, need to be carefully targeted and are usually only sustainable if linked to remunerative markets (Bangladesh, Mongolia).

3) **The myth of lactose intolerance:** Urban populations in countries traditionally seen as non-milk drinkers and/or lactose intolerant are increasing consumption of ready-to-drink processed and cultured milks (Philippines, Thailand, Viet Nam). School nutrition programmes have helped to develop the milk drinking habit while promoting future demand (Bangladesh, Philippines, Thailand); but they have been frequently based on imported milk, which does not benefit the local dairy sector (Bangladesh).

These lessons may be further consolidated into five overarching factors as follows:

1) **Smallholder dairying** is straightforward in concept but complex in execution.

2) **Smallholder milk producers** must be competitive in order to access markets, i.e. produce top quality milk at affordable prices. In achieving this status most subsistence smallholder milk producers have progressed to become small commercial dairy farmers.

3) A “**Strategy of including smallholders requires a deliberate and creative development vehicle that would be sensitive to the impact of policies, programmes and activities to smallholders**” (Sally Bulatao, the Philippines)

4) **Smallholder dairy action plans:** the impact of appropriate policies, programmes and activities on smallholders depends on the local context and, most importantly, the people involved

5) **The private sector must be fully engaged in participating in the development of:**
   - the regional smallholder dairy strategy
   - national actions plans

**Conclusions and the challenge for workshop participants**

Leaving aside the two major dairy production and consumption countries of Australia and New Zealand, developing countries in the Asia-Pacific region have very different traditions of milk use and consumption. These are reflected by very different levels of per capita milk consumption, which ranges from as little as 2 kg to almost 200 kg/capita/year. This compares to an overall average in Asia of 41 kg and 196 kg for developed countries. With the gathering pace of globalisation, consumer preferences are changing and those countries not traditionally associated with milk drinking are adapting their food consumption habits as urbanisation and disposable income increase.

In the 1970s and 1980s, huge, so-called integrated dairy programmes and projects were set up in many countries in the region with hugely expensive, high capacity western technologies and equipment with the help of the international community. At the same time- in some of these same countries, incentives to invest in local dairying were constrained by policies of these same donors which supported the movement of huge amounts of subsidized milk onto international markets, mainly in the form of skimmed milk powder and butter oil. Some developing countries in Asia were able to use these commodities to develop their own dairy industries, such as India which used European surpluses as an investment into the modernization of the dairy industry. Others could not and the influx of low priced imports resulted in depressed local milk prices, stagnating milk production, and an underutilization of dairies, partly because the packaging materials and spare parts from developed countries were very expensive. Today these countries are still highly dependent on imported milk. On the other hand, during this period dairying increasingly became recognized as a catalyst for livelihood and social development, initially based on the success of the Indian Anand pattern dairy

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4 The subject of school nutrition schemes based on local milk or imported milk is covered in Session 2 paper: Selected smallholder dairying experiences from Bangladesh and Mongolia
5 **Strategy (n):** plan, scheme, policy, approach, tactic, line of attack, stratagem
   **Policy (n):** rule, strategy, plan, guiding principle, course of action, guidelines, procedure
   **Plan (n):** diagram, map, chart, sketch, graph, arrangement, preparation.
cooperative model. This cooperative was driven by its charismatic leaders that now benefits tens of millions of smallholder milk producers in many parts of India. The new dairy park models (centrally-operated collectives) from the Inner Mongolian Autonomous Region of China are even larger. It needs to be recognized, however, that these successful models can not be immediately replicated in other places due to the specific and contextual enabling environments, which are not easily transferable.

There have been many initiatives, consultations and workshops over the past quarter of a century on dairying for developing countries. As long ago as 1974 the slogan “Dairying as an instrument of change” was adopted by the International Dairy Federations and FAO at the International Dairy Congress held in Delhi, India in 1974. Many workshops addressing smallholder dairying have been held since, with limited impact and virtually no involvement of the private sector.

How can our workshop and the outcomes flowing from it be different and have more lasting impact? We believe that the workshop and our approach have some unique advantages in this respect.

1) First, our approach is participatory, i.e. inclusive of all stakeholders throughout the producer-consumer dairy food chain, including the public, private and NGO sectors. We have participants here representing all these interest groups.

2) Second, the workshop is dynamic, i.e. it builds on the smallholder dairying workshop held here in Chiang Mai by APHCA in late-2004, but more importantly will build on your combined experiences as well as some newly developed systematic tools for assessing the competitiveness of the various smallholder dairying models.

3) Third, the regional dairy strategy and national action plans will be business-oriented, i.e. it will recognise the market and the private sector as the driving forces and Governments as facilitators.

We are extremely fortunate to be implementing our project at a time of unprecedented demand for milk in the region and the prospect of increasingly remunerative prices for milk producers. We have the technologies, the equipment and the knowhow in the region to increase milk production to the benefit of smallholder milk producers, processors large-scale and small-scale, and urban consumers.

Our project slogan is Asian milk for health and wealth: healthy people, wealthy producers. Our challenge is to grasp these opportunities and, in so-doing, better the livelihoods of smallholder milk producers and milk consumers in APHCA member countries.
The Indian Dairy Industry is at cross roads. An industry which has strongly been dominated by the government sector and working in co-operative mode is going to face keen competition from private sector in procurement and marketing of dairy products in the coming years. Dairy co-ops have performed well in some states; for example, the AMUL co-operative in Gujarat. But in many states, these institutions are weak representatives of farmer interests. Their functioning is more of a parastatal, characterized by strong linkages and interference from government. Furthermore, private companies, depending on their market power, tend to use the cooperative price as a benchmark to determine farmer milk prices. In this situation, weak co-ops competing with private sector may not serve the farmers they represent. Key questions for policy makers, industry players and smallholders in this context are: Which models better serve the interests of the farmers? What policies are conducive to support their interests?

Overview of the Indian dairy sector

India is the largest milk producer in the world, with milk production at 100 million MT and valued at Rs. 1,179 billion (2004 -05). This is almost equal to the combined output of paddy and wheat. The country also has 1/5th of the world bovine population which consists of 45% indigenous cattle, 55% buffaloes, and 10% cross bred cows. Milk productivity per animal is very low at around 1,000 kg/lactation, compared to a world average of 2,038 kg/lactation. Low genetic potential, poor nutrition and lack of services are key ingredients for low productivity. However, the diverse nature of India implies that different regions in India are at a different level of dairy development. For examples, Punjab and Maharashtra can be considered as well developed dairy states while Tamil Nadu and Andhra Pradesh fall in the category of states with average progress. The states of Bihar, Orissa and most NE states fall in the category of less developed areas.

Tremendous growth as a result of Operation Flood

During the period of 1950s and 60s, milk production in the country remained stagnant. Major dairy policy changes were introduced under Operation Flood, initiated in the 1970s. The key objectives were: linking-up rural producers with the urban consumers through pricing, procurement, processing and marketing, and large public investment in milk processing sector (chilling plants, milk processing and product manufacturing plants) through cooperatives. An indicator of success was that, juxtaposed to the growth rate of agriculture which was below 2%, growth in the livestock sector exceeded more than 4.5%. The biggest impact of these changes was on rural nutrition, employment, income and women empowerment.

Dairy and livelihoods: Opportunities for pro-poor impact

Dairying in India is a small farmer activity the proceeds of which comprise about 1/3rd of rural incomes. Small and marginal farmers own 33% of land (<2 hectares) and about 60% of female cattle and buffaloes. 75% of households own cattle with ownership averaging 2-4 animals. As dairying is a part of an integrated farming system, feed is mostly residual from crops (paddy straw, ground nut straw) and serves as an inexpensive input into the dairying process. In addition, dairying provides regular income to the farmer throughout the year whereas crop income is seasonal – risk minimization mechanisms. Further, livestock is a security – an asset to be sold in times of crisis.
Marketing

15% of the marketable surplus goes through organized sector, where the rest goes through the traditional unorganized sector. Until recently the organized sector consisted mainly of co-operatives. The AMUL model of Gujarat was replicated in all states of the country with NDDB as the lead agency. The co-operative are traditionally 3 Tiered structures - Village society, district unions federated at state level. The Model adopted with some variations in different states However, in many cases because of heavy government interference and weak democracy at the village level, co-operatives have achieved limited success in various states.

Regulatory environment

The dairy sector was de-licensed in 1991. However, some controls were reinstalled through Milk and Milk Products Order 1992. In particular, these included the specification of collection areas/milk sheds and fixing processing capacity. With the revised MMPO in 2002, almost all controls stand withdrawn. Until recently, with strong government controls, co-operatives did not have any competition from the private sector. After liberalization, however, private sector investment in dairying has increased considerably. To strengthen co-operatives in the face of private competition, a MACS Act was passed in 1995 with the objective of minimizing government interference and strengthening democratic societies at the village level. Finally, the MACS societies do not have to follow prices set by the Co-operative.

Livestock inputs and services

Agriculture policy is State-determined in India with the Department of Livestock housed with within the Ministry of Agriculture. The Department of Livestock has a network of veterinarians providing livestock veterinary services with many of these services fully subsidized by the government. However, due to financial constraints, partial cost recovery has now been initiated in several states. Efforts to enhance coverage through paravets and community based animal health workers (CAHW) have been initiated. Co-operatives are also involved in feed distribution at subsidized rate to the member farmers.

Future potential

With increasing incomes and increase in population, the dairy industry is likely to have a high growth rate in the coming years which portends opportunities to enhance small farmer incomes from through the development of dairy enterprises. However, it is important, on an enterprise basis, to assess the critical strengths and weaknesses within the dairy value chain.

Input challenges for the sector

- **Breeding:** Efforts have been undertaken to enhance breeding facilities through the National Cattle and Buffalo Breeding Program. However, the performance is far for satisfactory. Only small percent of animal bred are covered by artificial insemination with the remainder dependent on natural breeding.
- **Health/Extension:** State veterinary departments are the key players. However, while they have well qualified technical manpower they lack financial resources. NGOs, private veterinarians, and paravets are also providing rural services with partial or full cost recovery has been started in many states. This has enhanced the reach as well as the quality of services. Regions with high producing dairy animals, willingness to pay for the services and private veterinary services are flourishing. However, in general, extension services have been severely lacking and lack of information about good feeding practices does not enable farmers to capitalize on potential market opportunities.
• **Feed**: The availability, quality and the cost of feed is an issue. 70% of arable land is dry or rain-fed with erratic rainfall resulting in poor productivity of cereal grains and low output of dry fodder. In particular, the availability of land for fodder grass is an important issue as farmers prefer to plant high value crops to maximize returns from scarce land. While subsidized feed is available through co-ops, the quality and affordability are issues.

• **Credit**: Farmers have highlighted lack of access to credit as a major factor in expanding dairy activities. Access to institutional credit is very poor while credit through informal channel is charged high interest rates.

**Marketing issues**

Two major dairy marketing channels are predominant in India: the organized channel, which has mostly served by the co-operative, and traditional channels in which traders procure milk from rural areas and sell in urban areas. Milk prices are typically set by the co-operatives and in India, the fat content in milk is very valued. This leads to prices for cow milk being lower than that of buffalo milk. Premiums are established for fat content; hence buffalo milk fetches higher price, while cow milk pricing is based on total solids. For example, a farm price is Rs. 11 for cow milk and Rs. 14 for buffalo milk (0.25 USD & 0.35 USD). This compares to a 1 liter bottle of water which costs Rs. 12. The trader, as well as an emerging private company, usually pays a small amount higher than the co-operative with the co-op price serving as a benchmark price. Quality of milk is also an issue, and the bacterial load is high due to the amount of time taken to reach the bulk cooling/chilling center. In a large part of the country, there are no testing facilities at the village level. However, there are ongoing government efforts to enhance “clean milk production” by improving practices and providing subsidies and loans to develop this infrastructure.

**The competitive environment**

While historically co-operatives have not had much competition from the private sector, in recent years, private sector activity is increasing. Consequently, one priority for smallholders is to strengthen co-operatives to allow them to better compete with the private sector. Regulatory changes have been introduced in the co-operative sector through MACS and formation of “Producers company”.

Key features of MACS (Mutually Aided Co-operative Societies)

- Two tier, village level and union level, no state federation
- No government control in administration
- Democracy at the village and union level
- Freedom in setting prices
- Accountability and ownership at the village/union level
- Strong governance and internal audit system
- More freedom to village level societies (more than 1 soc/village)

**Three typical value chains in India**

Andhra Pradesh state in South India is a leader in dairy activity and has experimented with various new models for dairy. It was the first state to introduce the MACS Act. Also, the private sector in this state is very active. Of the three chains chosen for this analysis, two are in Andhra Pradesh and the third is a state co-operative from a lagging region. The first model is a large private sector dairy, the second a MACS society in AP, instituted in 1998.
**Model 1: The Private Dairy**

This Dairy is head quartered in Andhra Pradesh. It was initiated in 1992 after MMPO permitted private dairies and is now traded on the stock exchange. Daily milk collection is about 7 lakh liters per day. Milk is collected from 150,000 households and 3500 villages in three states, though the major operations are in AP. The company is now serving 3 main metros with fresh milk – Hyderabad, Chennai and Bangalore, and is now ready to enter Mumbai.

**The Model**

The company procures milk through agents in the village with the quantity procured dependent on the personal relations of the agent with the villagers. Several villages have more than one agent, depending on the social structure as well. The company is not directly involved with the farmers and negotiates the price with agent. It is not involved in setting the price that the agent gives the farmers.

The price paid by the agent to the farmers is slightly above co-o price in the state. Many times, the agent in the village is competing with agents of other private companies for milk procurement. Consequently, the agent oftentimes gives loans to farmers to maintain loyalty. Collection areas depend on milk density and are in areas in which district co-ops are less active.

**Model 2: MACS Society in Andhra Pradesh**

Dairy activities started in the district in 1971. This district union has now delinked with state Federation and in 1998, following the inception of MACS Act in 1995, transformed itself into a MACS society. The union is currently collecting milk from 650 villages in the district. Milk collection is 60,000 liters per day, likely to go up to 100,000 in the coming 2-3 years.

**Business Model of MACS**

As per MACS norms, this is a 2 tiered operation at the village level and district level. The village level is managed by the village society, district level by BOD. Both of these societies are run by members elected every year. The village level society itself is registered as a separate MACS society and has the freedom to use its own profits. 10% of sales are allowed at the village level to earn higher profits.

**Model 3: State Co-operative**

The state co-operative is an apex level Dairy Cooperative Society registered under Cooperative Society Act – 1962. Currently, milk procurement is from 12 district unions. About 322,000 liters per day is collected from 3800 village societies and 224,000 farmers. Currently, there is not much competition with private sector in the area.

**Comparative analysis of the chains: Support along the chain**

**Input supply**

In the Private Dairy, there is no provision for input supply except for occasional loans given to farmers. The MACS Society provides breeding and health services through linkages with NGOs/State Dept. They also manufacture quality feed and supply to farmers at subsidized rates as well as organizing thrift and credit co-operatives which extend credit for animal purchases. Finally, veterinary medicines are available at cost at extension meetings organized for farmers. In the State Co-operative, feed is available at subsidized rates through the village society while breeding and health services can be procured through the State Dept. There are no facilities for loans; while medicines are available at cost, adequate supply is a problem.
Production

At the farmer level, differences are minimal between the three models because of a lack of extension activities carried out by any of the three agencies. However, it is possible that in the case of the MACS society because of extension and provision of feed, producers may be using more and better feed as compared to crop residues. However, this needs to be confirmed.

Milk procurement

In the Private Dairy, milk purchases are done through the agent who decides what price he will give the farmer. This is usually decided based on competition with agents of other companies and based on the declared co-op price. Testing is done in very few cases. This has implications for farmer confidence in the prices received. In the MACS society, milk collection is done through Village MACS society, which is democratic functioning society. The MACS has the freedom to decide the price and does not have to follow the co-op price. Prices declared by the Union are usually higher than Co-op pricing and testing of milk is conducted through electronic milk-o-testers. In the State Co-operative, collection is done through the village society, which is run by a president who wields considerable power. Farmer prices, fixed for cow and buffalo milk, are declared by the co-op which typically are low. In most cases, there is no testing. There appears to be a lack of uniform pricing with influential people in the community receiving better prices.

Processing/Marketing

The Private Dairy processing plant is ISO certified and meets all quality requirements. They produce a variety of quality products catering to children and younger generation (yoghurt, flavored milk), mainly in the urban metro market. The MACS society has good quality products, but no certification as yet and the products are largely traditional products. They are selling milk to urban consumption areas, while tapping the rural markets as well through village societies (small packets, 250 ml). At the Co-operative, quality of the milk continues to be an issue though it has improved in the recent years. The co-op is also largely selling traditional products, mostly in the urban market.

Future growth

The Private Dairy is not involved in dairy development activity and is only focusing on procurement. Faced with increasing competition, they will have to move to newer areas for expansion. In the future, if MACS becomes strong in these areas, procurement will be affected. The MACS society involvement in dairy development activity will help them to grow and increase milk procurement in this area. They are geared to face competition from private sector because of the community linkages at the village level. Finally, the Co-operative, because of low involvement of community, will find it difficult to compete with private sector. Difficulty in competing will also be magnified by their lack of variety and quality of products.

The way forward

It is evident from the above discussion, that the MACS society best represents the interests of the farmers in the coming years, with stiff competition from private sector. The Act was passed to make the co-operative strong in face of competition, however, the act is most practiced only in AP, with other states having yet to put the Act in place. In AP itself, the previous government was supportive, but the new government is not supportive of MACS and has stopped further conversions of district unions to MACS. In the past few years, about 650 MACS societies have registered in the state.
Smallholder dairy development in Viet Nam

Patrice Gautier, Asian Veterinary & Livestock Services

Viet Nam has a relatively short history in both production and consumption of dairy products. Five main waves of development of smallholder dairy can be described:

a. Early eighties: the first smallholders started in the 4 provinces (Son La, Ha Tay, Lam Dong and Ho Chi Minh City) where state dairy farms had been set up by the government.

b. During the nineties, dairy smallholder models started in 7 additional in provinces nearby the major two cities (Hanoi & Ho Chi Minh City).

c. From 2000 to 2004, with the implementation of the first Dairy National Plan and the import of dairy cattle, a more rapid development was reported in 22 new provinces.

d. From 2005-2007, the number of dairy smallholders and of dairy cattle decreased in the Northern provinces and especially in provinces witnessing the more recent investments in the sector.

e. Since the end of 2007, a new wave of development is observed due to the major increase of world milk prices which has resulted in a major increase of the price of fresh milk.

Locations of dairy cattle in Viet Nam in 2005

Today while most of the milk is produced by up to 20,000 smallholders, they account for less than 1% of the total number of livestock smallholders in Viet Nam. The country’s herd is now around 110,000 dairy cattle with a total milk production of around 220,000 tons per year. Around 70% of the production is located in and nearby Ho Chi Minh City. The herd includes around pure Holstein-Friesian (15%) and crosses between HF and the Lai Sind (already a cross between Red Sindhi & a local small cow). Most smallholders have less than 5 dairy cattle raised in a zero-grazing way with the
average herd size per farm tending to increase over the years. Elephant / king grass and local grasses are the main forages given, although maize silage and new tropical and non-tropical forages are being more used. Average production levels are reported to be around 4,000 kg (pure-HF) and 3,500 kg (HF crosses) per lactation. However, there are great variations and generally a very high calving interval.

Milk is sold to nearby milk collection points generally equipped with cooling tanks, then transported to more than 5 private processing factories. These factories produce pasteurized, UHT milk, yoghurts, etc. The informal market accounts for less than 20% of local consumption. Consumption has constantly expanded since the mid-nineties and has now reached around 1 million tons (or 10 kg per capita). However, imports of dairy products represent around 80% of the consumption.

Overview of models and description of studied smallholder dairy models

More than 90% of dairy producers have less than 10 cattle. They are found mainly in lowland areas where the human density is high. A small percentage of producers are also located in more upland locations which support the few large-scale dairy farms. Smallholder dairy models can therefore be found in almost half of Viet Nam’s provinces.

Four models were visited during the study:

a. Tien Du / Bac Ninh
b. Ba Vi / Ha Tay
c. Don Duong / Lam Dong
d. Hoc Mon / HCMC

In these models:

a. Smallholders are either less than 1 hour away or more than 6 hours from processing factories.
b. Weather is tropical for most of them but with a cooler season for northern Viet Nam. In Lam Dong, the weather is less tropical and more temperate.
c. There are strong differences between the models in term of forage availability, distance from market, competition between processing factories.

All 4 provinces where the models are located have experienced a herd increase (increase by 2 to 4 times between 2001 and 2007). However, in Bac Ninh & Ha Tay, after a rapid increase between 2001 and 2004, the herd has been decreasing.

Key reasons for success

The recent increase in milk price makes these models’ success more obvious today. Three of them have been operating for 25 years and one for 12 years. These models were not so much affected by the decrease in number of cattle, dairy smallholders observed from 2004 to 2007. However, had the recent increase in milk price had not happened, some of them would probably have started to reduce production too (particularly in the north).

The key reason for these models to be still operating today (despite the low profitability during some years) is likely to be that smallholder dairy developed there in a gradual manner. Many initial weaknesses (low technical skills of farmers; weak local services; milk marketing) were addressed through experience rather than artificially corrected. Over the years these systems maintained an
adequate and favourable balance between the models’ strengths and weaknesses. Indeed, one model may have a weakness that another one does not have, but the negative impact of this weakness may be balanced by the positive impact of some strengths.

The common favourable factors identified in these models (and not or less observed in models that have been unsuccessful): Experience > 12 years (rather than rapid training); Good local service providers & supported by external actors (NGO, Nestlé, Dutch Lady & state companies); existence of a milk buyer; appropriate feeding; appropriate breed (with management / environment).

**Options for improvement, expansion and replication**

A pre-condition for the further development and possible expansion of these dairy models is a better measurement and analysis of the current production and economic performances of smallholder dairy units. This can be done initially via a simple and cost-effective system that records and analyses the animal and the farm results. The challenge is to determine if improvement is possible; to identify the elements that can be improved; to assess how these elements can be improved; and to measure if improvement occurs after actions.

Improvement of productivity is essential if smallholders want to survive a sudden decline in world prices of milk. Some of the needed changes (in addition to the recording & analysis of performances) may be:

- a. Farmers moving up in the value chain (through decreasing the role of independent milk collectors; introducing more transparent payment of milk)
- b. Mandatory minimal standards for milk quality
- c. Better management of heat stress
- d. Adequate supply of essential veterinary medicines
- e. Continuing professional education/training for farmers and services
- f. Up-scaling herd sizes and/or number of farmers

**Replication of the existing models can be successful if:**

- a. There is an active & transparent dissemination of lessons learnt from successful & unsuccessful models
- b. SWOT analysis are conducted
- c. There is a good selection of new dairy candidates (“dairy is not for any farmer!”) and a mandatory training course for them as well as for their new support services.

**Key reasons for failure of other models**

The models that have been set up from 2000 onwards have experienced serious difficulties, if not almost complete failure, during their first years. But following the recent milk price increase, development could occur again in these “inexperienced” dairy locations. These models had to deal with a combination of several weaknesses at the same time, possibly similar to the ones faced by the older models during their initial phases. However, the new models started in a period where (1) the cost of heifers was very high; (2) the price of milk was very low.

**Summary of reasons that explain the difficulties of some new models:**

- a. High speed implementation / Insufficient SWOT analysis
- b. Low experience + Low milk price + High heifer price + High feed price
- c. Small scale milk production and no interested dairy processor
- d. Insufficient support services (public support was there but inexperienced; whereas private was not there yet because of small production)
e. Lack of learning from successful models
f. Farmers discouraged because of lack of trust in dairy processors

Conclusions

Smallholder dairy in Viet Nam is still a young activity. Major gradual changes could occur in the coming years and decades particularly as urbanisation continues to expand in the main dairy production zone (Ho Chi Ming City). The success of smallholder dairy depends a lot on the world price of dairy products and on the willingness of the processing factories to decrease their margins especially during difficult times for farmers.

Certain important factors are, however, controllable and can be encouraged by policy makers:

a. Improving productivity: continuing professional education; recording of performances; more support to local private service providers; milk quality standards
b. Information sharing (example of “Dairy Viet Nam”), facilitation of public-private initiatives especially in new locations
Enterprise-driven dairy: 

The Philippines’ smallholder dairy sector

Sally Bulatao,
National Consultant/Dairy Enterprise Specialist

This paper consists of: (1) a brief description of the Philippines’ milk market; (2) highlights of four cases, one of which has a focus on enterprise elements; and, (3) the development strategies and activities recommended for improved market access by smallholder dairy producers.

Market overview

The Philippines’ milk production in 2006 was equivalent to half a day’s milk production in India in that year. The daily milk production in the Philippines is easily produced by a single dairy farm in Florida or California. With an annual milk production of 13 million liters or barely 36,000 liters per day, there is hardly an industry to speak of, in terms of production.

However, milk consumption tells a different story: the Philippines represents a sizeable and growing dairy market generating annual sales of milk and milk products worth nearly one billion US dollars. It is the 2nd biggest country destination for New Zealand’s exports of milk and milk products. At its highest in 2005, liquid milk consumption was 25 times the consumption level in 1991. On a daily basis, this was 125,233 liters per day, from 5,424 liters per day in 1991. This, however, would appear as a flat growth rate when compared to China’s milk consumption which has doubled over the last five years. In the Philippines, the growing preference for natural food figures as a dominant demand driver rather than a fast growing mass purchasing power for milk and milk products. Nonetheless, Table 1 is attached to provide the basic indicators of the Philippines’ dairy industry.

Notwithstanding a demand situation that is slower in comparison with emerging Asian dairy markets, the rising world milk prices in the 2006-2007 period visibly enhanced small milk producers’ edge in the direct consumer market as well as in the food service and industrial use market. Higher milk import prices already neutralized by a stronger peso resulted in more competitive price levels. Specifically, a liter of UHT milk which sold for P54 (US$1.12) in 2006 is priced at P65 ($1.59) in 2008 compared to fresh milk prices that averaged about P60 ($1.43) over the same period. Bulk pasteurized milk for food service outlets and industrial users also started to explore the use of local fresh milk following the improved price difference.

Who are the smallholder dairy producers of the Philippines?

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 its imported UHT milk component and the locally –produced fresh milk component. It is only in the liquid milk sector that smallholders figure in the industry.

The last survey of dairy enterprises conducted by the Bureau of Agriculture Statistics in July 2002 covered 4,957 dairy farmers in cattle, carabao and goat farms. Of these, 85 percent (4,194 farmers) owned from one to four dairy animals while another 11 percent (564 farmers) owned 5 to 10 dairy animals. Hence, unorganized small dairy farmers and smallholder milk producers, together, comprised some 96 percent of the local dairy farming sector.
### Table 1. Philippine Dairy Industry Indicators

<table>
<thead>
<tr>
<th>Indicators</th>
<th>1995</th>
<th>2000</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual milk prod'n in million liters</td>
<td>12.11</td>
<td>10.21</td>
<td>12.34</td>
<td>12.87</td>
</tr>
<tr>
<td>Total dairy herd</td>
<td>21,054</td>
<td>21,100</td>
<td>26,344</td>
<td>28,395</td>
</tr>
<tr>
<td>Cattle</td>
<td>11,145</td>
<td>7,780</td>
<td>11,733</td>
<td>13,092</td>
</tr>
<tr>
<td>Carabao (Buffalo)</td>
<td>8,134</td>
<td>11,943</td>
<td>13,606</td>
<td>13,648</td>
</tr>
<tr>
<td>Goat</td>
<td>1,775</td>
<td>1,377</td>
<td>1,005</td>
<td>1,655</td>
</tr>
<tr>
<td>Total dams and does</td>
<td>9,687</td>
<td>10,254</td>
<td>12,679</td>
<td>13,255</td>
</tr>
<tr>
<td>Cattle</td>
<td>5,543</td>
<td>3,550</td>
<td>5,210</td>
<td>5,669</td>
</tr>
<tr>
<td>Carabao (Buffalo)</td>
<td>3,360</td>
<td>5,950</td>
<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 volume(^1) in LME (in million liters)</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 liters per year</td>
<td>16</td>
<td>16</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Number of farm families engaged(^2)</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 programs</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.

\(^2\) First survey of farmers engaged in dairy was conducted in 1996 by the Bureau of Agriculture Statistics.

Three dairy enterprises, selected for the high degree of smallholder participation, have been identified as the initial source of data in a value chain analysis of the Philippines’ dairy sector. These are the Katipunan ng Kooperatiba ng Maggagatas, Ink, (KKMI) in Calauan, Laguna in Luzon island, the Federation of Davao Dairy Farmers Cooperatives (FEDDAFC) in Malagos, Davao City in the island of Mindanao, and the Kapanig Multipurpose Cooperative in San Juan, Siquijor in the Visayas. A fourth one, the carabao development program of the Philippine Carabao Center in its National Impact Zone in Nueva Ecija is, likewise, profiled to showcase buffalo-based dairy enterprises.

The full presentation includes slides on the highlights and winning features of each case. However, the discussion below is focused on one case to better illustrate the business features applied by a smallholder-based dairy enterprise.

**Federation of Davao Dairy Farmers Cooperatives (FEDDAFC)**

This plant started operation in 1990 under the direct management of the coop federation, FEDDAFC. Starting with four founding primary coops, it is now composed of 13 primary cooperatives of about
200 farmers. It processes an average of 1,100 liters of milk daily. Operating results of the plant had been up and down for most of the years depending on the trustworthiness of the plant manager. The federation has hired professional managers who have come from bigger firms and has also designated from among the farmer board members as General Manager. FEDDAFC has been the victim of numerous funds misappropriation. NDA has actually taken over management of the plant in the past. But the take over two years ago involved a change, not only in management, but of plant ownership as well.

**FEDDAFC’s turnaround and the interplay of competitiveness factors**

Towards the end of 2005, this plant was declared delinquent for failing to pay its farmer suppliers for raw milk delivered over three months. The *lease contract* with the NDA for the use of the plant includes a clause for automatic take over by the NDA in case of non payment to farmers for at least two months. NDA implemented this provision and completed the turnover of the plant from the coop federation to the NDA after a series of general assembly meetings where all members were informed on the consequences of such a takeover.

The assets of the enterprise were valued and the NDA took its *equity share* in the enterprise. The dairy federation ended up holding a minority share of 21 percent in the new entity which took on the nature of a public-private venture.

With the takeover, the General Manager (GM) designated by the NDA had to deal with a workforce that was wary if they would be retained under the new management. The staff transition to new assignments was handled adequately although not without intense pressures at the start, particularly on the GM.

There were suppliers to be paid, farmers waiting for milk payments, bank accounts to be validated and a market to put in shape. To the credit of the GM and her team, these matters were handled one by one and the plant slowly assumed a new dynamism.

Within the first year of the takeover (2006), the enterprise realized a net income. The profitability was sustained into the second year (2007).

The Davao Milk Plant has initiated various other schemes that contribute to its good enterprise performance. In particular, the development of its *network of 29 dealers* of frozen milk products has stabilized the market for 43 percent of its product mix. The dealers pick up the goods from the plant significantly reducing delivery costs. In turn, the dealers distribute the frozen milk bars to their own network of variety stores and school canteens. The Plant Manager who is also the General Manager meets with the dealers regularly to enforce the delineation of the area of coverage of each dealer and avoid unhealthy competition. This product line, developed in the last two years, has greatly reduced the dependence of the plant on school milk feeding as a market.

Customers in Davao City have associated fresh milk with the brand Davao Dairy Best. *Brand recognition* is acknowledged and that is why the enterprise pays the coop federation a royalty for the use of the brand. It is designed in an attractive format that allows it to compete on the supermarket chillers side by side with other commercial milk brands. The General Manager realized that supermarket sales can be profitable as long as the documents for collection of accounts are prepared promptly and served to the supermarkets regularly.

The plant has also installed a *milk payment system* that pays an average of P2 on top of the base price of raw milk. The plant quality assurance staff visited individual dairy farms to demonstrate milk collection procedures. Milk collected is then tested for compliance. The first round of tests was done
without any charges to the farmer. However, when they fail and subsequent tests are required, the farmer has to pay a testing fee.

The Davao Plant maintains a sales force that is paid on a commission basis. Instead of keeping a regular sales force, the team sells milk in particular residential areas and gets compensated based on volume sold. The system has improved sales and reduced overhead for the enterprise.

Organizationally, this first attempt at a public-private venture is stimulating the imagination of the players. They are currently in discussions on how to maintain the discipline installed through the new organizational setup while increasing the equity of the farmers and possibly, the plant team, in the venture.

The entry of a foreign investor as a new player in the dairy zone represents both a shift in factor conditions (more animals, new farm infrastructure) as well as an enhancement of competition within the zone. Instead of being considered a threat, the new player stimulates good milking practice among the farmers who would not want to be outdone by the newcomer. Aside from this, the Korean investor has been a source of some farm equipment made available to the farmers in exchange for a young calf or a heifer.

The pressure on land use, however, is a factor condition challenge to the Davao dairy zone. Plantations of high value crops compete with use of land for dairy purposes. Many smallholders are either tenants or leaseholders who usually have to give up the land when the landowner decides to shift the use of the land to a fruit orchard or to lease the land to a corporate farm.

On the other hand, young, second-generation dairy farmers are taking over and improving the existing dairy farms. Anthony Naraval is an example of the new batch of dairy farmers who are keen on engaging in dairy as an entrepreneur. The crop of young dairy farmers represents an enhancement of factor conditions in the dairy zone. Having fully paid their previous animal loans, they are preparing to acquire additional animals to increase their dairy herd.

FEDDAFC, as a federation, continues to suffer from weaknesses in leadership. Its officers seek to buy back the plant but there are no assurances that the problems of the past will not recur if this happens. The tension between the objective of establishing a viable enterprise and the traditional drive to put all operations in the hands of smallholders is playing out vividly in this situation. All the parties involved – the NDA, the cooperatives, the plant staff – will all interact to shape a suitable enterprise structure that will effectively protect the gains of the enterprise while ensuring the maximum benefits to smallholders. The settlement of this issue reflects the interplay of enabling government support through the NDA as lead organizing institution and the governance structure of the cooperative and its capacity to discipline its ranks.

During the validation meeting with industry players, the following activities were recommended: the holding of regular farmer-to-farmer visits and exchange of farm practices among smallholder dairy farmers, the formulation of feed rations for dairy zones with the appropriate feeds testing and milk yield monitoring, the gearing of areas with limited markets for milk as suppliers of dairy stocks, encouraging the establishment of breeding enterprises among AI technicians at the village level, formalizing popular calf rearing and growing arrangements at the coop level and the enhancement of coop-based lending programs.

Other lines of action that have been considered following discussions with model enterprises are the following:
1. **Establishing common facilities along the value chain:** for feed testing, for herd recording, for laboratory testing of milk, label and package design, business and label registration. The common facilities may be distinguished from government extension work in that dairy enterprises themselves could contract the delivery of common services at fees based on business results traced to the services accessed. Some examples may be increases in milk yield due to regular feed testing, improved calving interval due to herd recording, longer shelf life due to laboratory testing, increased sales due to improved product label, etc.

2. **Toll processing:** improved toll processing arrangements can broaden engagement of smallholders and increase their share in final product margins. It can also reduce working capital burden of processing plants and help balance production and use of milk throughout the year. New players, from among smallholders’ families, may participate.

3. **Management training:** smallholders need professional help but qualified and honest managers are not easy to find. Firm-level content of conferences may be given more emphasis so that discussions can focus on business matters. Exchange activities may also include small exhibits of equipment and packaging materials that may be useful for farms and plants. Here, successful smallholders and plant managers may be invited as resource speakers. Successful smallholders may be tapped as on-farm trainers.

4. **Designs for making local markets work:** sponsored school milk feeding, product positioning at key outlets, targeted public taste tests, monitoring of customer feedback.

5. **Dairy business process outsourcing:** some administrative support services may be initiated on an outsourced basis such as the collection of receivables, preparation of regular financial statements, executive search and training.

6. **Identification of technical and enterprise performance indicators that smallholders can compare with one another.** Some of these indicators may be the milk yield per kilogram of concentrates fed to the lactating animal, calving interval, milk payroll, cost to produce a liter of milk and similar measures.

7. **The conduct of comparative cost and return analysis for dairy and alternative crops.** This study would enhance the enterprise awareness of farmers who can be introduced to the concept of opportunity costs and comparative investment options.

**Prospects for enterprise-driven dairy development**

There are strong indications of accelerated growth in the Philippines’ dairy sector. Most prominent of these signs is the maturing of enterprises that have established their market networks and are able to invest in expansion without relying, solely, on government support. These are the building blocks that provide the foundation of the industry. The same enterprises represent individual dairy producers who have “learned the ropes” and are realizing the gains from the industry. Ultimately, it is the concrete benefits that would make the players remain in the industry.

The profitability of these enterprises, in turn, has been attracting new entrants that may yet provide the needed “critical mass” for the industry to move ahead, gaining more credit support and a more conducive policy environment.

Even government that has historically provided wavering support is poised to allocate more assistance for herd buildup, breeding infrastructure and common facilities. The big challenge is to evolve the suitable enterprise designs that will maximize smallholder participation in the value chain.
Competitiveness framework for Asian smallholder dairy development

Phil Psilos, Value Chain Competitiveness Consultant

The short-term boom in world dairy prices combined with long-term growth prospects for dairy products in Asia presents a promising opportunity for strategies to include and upgrade smallholder participation in these markets. Smallholders and the national and sub-national (local) dairy value chains may be able to respond to growing market opportunities, but there is no guarantee of this outcome. This presentation is focused on how the FAO-CFC-APHCA team is working to develop a framework for understanding the ability of smallholder dairy in participating countries to respond to these opportunities. For the purpose of this project, we refer to the related abilities of value chain participants to respond to market opportunities, upgrade to meet new market requirements, address challenges posed by international competition, and to provide sustainable livelihoods to value chain participants as the competitiveness of the smallholder dairy enterprise.

This presentation outlines the elements the competitiveness framework, why it was developed, and how it was used by the three consultants you heard from this morning to produce some indicative results from three countries. In the next session, the consultant team will facilitate your working together to perform a rapid self-assessment exercise using this framework.

The competitiveness framework is a set of analytical steps that constitute a structured process for analyzing the current situation of smallholder dairy as an enterprise in any given national or sub-national marketplace in a way that can provide useful comparisons across the participating countries. Because the goal of the FAO-CFC-APHCA process is to develop a strategy that can enable participants to succeed in many different environments, it is also an attempt to develop a common language that can help with the discussion of common challenges and differences between markets. Thirdly, the framework is a tool for analyzing and comparing the actual current situation from the inside, rather than against a single benchmark of what is “correct.” It is based on the approach that all participants can experience improvements in smallholder dairy performance, though some countries may have more favorable overall conditions and greater success in the long-term. Finally, the framework is a method for identifying which models are most suitable to address and correct or overcome specific challenges, or to respond to specific opportunities.

If the project’s work were only focused on scaling up existing models in a specific country, the framework would be less useful. If, on the other hand, we want to help participants from many different countries and contexts select the right models (or elements of models) to address the constraints that they face, we need to be clear on what factors the models we are looking at can address, resolve, or improve. The three goals served by the competitiveness framework are:

1.) **Prioritization** of the most important deficiencies and opportunities in the smallholder dairy environment;
2.) **Informed collaboration** among participants who face similar matrices of opportunities and challenges;
3.) **Targeting models** to explore based on the specific challenges and opportunities participants face in their countries.

Feedback from some consultants has also suggested that the framework process has been useful as a discussion tool with national industry stakeholders, and in reaching new understandings regarding what industry participants see as the most urgent challenges of the environment.
Competitiveness framework: Process

Using the framework entails a number of analytical steps. Mapping and diagnosis of the dairy value chain yields an understanding of the issues facing smallholder dairy. In the framework, these issues are categorized into a standard set of performance/competitiveness drivers that fall into five areas. Each issue is then evaluated for whether it is subject to the influence (or control) of (1) governments, (2) firms, (3) whether it can only be partially controlled, or (4) whether it is entirely out of the span of control of local actors. The relative favorability or unfavorability of each issue is then determined (perhaps through discussions among a variety of stakeholders). Existing models are then evaluated and scored for their effectiveness in addressing the constraints of the environment. In this way, the framework helps us understand what elements of specific models provide solutions to our specific challenges, and what challenges require new policy and organizational innovation. It is our hope that the FAO-CFC-APHAC project will be a forum for assisting the dissemination of existing models, and for new policy and organizational innovation.

The five Performance-Competitiveness Drivers categories are (1) demand conditions, (2) factors of production and utilization, (3) market and competitive structure, (4) related and supporting industries, including producer services; and (5) government and business enabling environment. This category structure is derived from Harvard Business School Professor Michael Porter’s diamond model of competitive advantage. In this model, the competitive results for smallholder dairy are viewed as a function of how well the key drivers work together to produce a sustainable and profitable industry. Of course, the choice of these issue categories is somewhat subjective: other ways of categorizing issues could serve a similar purpose, but because this model captures economic, technological, institutional, governmental, and market structure issues across the value chain, it serves as a useful framework for analysis.

**Driver Categories with Sub-Factors**

<table>
<thead>
<tr>
<th>Demand Conditions</th>
<th>Market Structure &amp; Governance</th>
<th>Factor Conditions</th>
<th>Related and Supporting Industries</th>
<th>Business Enabling Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size and growth</td>
<td>Domestic Market</td>
<td>Herd</td>
<td>Value-Added Processing</td>
<td>National</td>
</tr>
<tr>
<td>Consumption patterns</td>
<td>Governance</td>
<td>Breed</td>
<td>Transportation and Distribution</td>
<td>Sector Regulation</td>
</tr>
<tr>
<td>Sophistication of consumers</td>
<td>Market Chain</td>
<td>Human Capacity</td>
<td>Producer services</td>
<td>Formal sector support</td>
</tr>
<tr>
<td>Receptivity to new products</td>
<td>Lead Firms</td>
<td>Distribution-Infra Capacity</td>
<td>Specialized inputs</td>
<td>Provincial/Local</td>
</tr>
<tr>
<td>Price elasticity</td>
<td>Barriers to Entry &amp; Rents</td>
<td>Processing</td>
<td>Specialized finance &amp; credit</td>
<td>Formal Private Governance</td>
</tr>
<tr>
<td>Impact of market opening and imports on local demand</td>
<td>International Market</td>
<td>Land Supply &amp; Utilization</td>
<td>Relevant research capacity &amp; utilization</td>
<td>Donor/NGO</td>
</tr>
</tbody>
</table>

In each of these categories, much of the analysis is subjective, but collecting the most important quantitative factors to describe the performance of the system is useful. Some of these measures, if collected and averaged out across the entire national market, could be quite misleading. As a result, some factors are much more useful in describing performance at the farm and enterprise level (those appearing to the left), and others, such as the demand measures fresh milk premium in a given country as a percentage of world market prices, are more useful in describing the national market environment. The team used this as a guide for data collection, and are still exploring how a simple set of quantitative indicators can improve the framework’s effectiveness.
What can be quantified rapidly?

<table>
<thead>
<tr>
<th>Factor conditions and utilization</th>
<th>Market structure &amp; governance</th>
<th>Producer services and value chain depth</th>
<th>Demand conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calving interval (# months)</td>
<td>Transport &amp; Processing Costs (TPC) per unit output</td>
<td>Growth in processing capacity (5 years, %)</td>
<td>Demand growth</td>
</tr>
<tr>
<td>Quantity milk output/year (UNIT)</td>
<td>TPC as % WMP</td>
<td>Licensed veterinarians per 1000 population</td>
<td>Fresh Milk Premium (FMP) as % WMP</td>
</tr>
<tr>
<td>Lactation period (days)</td>
<td>TPC as % FMP</td>
<td>Capital resources</td>
<td>FMP increase past 5 years</td>
</tr>
<tr>
<td>Feed/fodder unit cost (FF) in local currency</td>
<td>Spoilage/Losses as % output</td>
<td></td>
<td>% output to non-powdered uses</td>
</tr>
<tr>
<td>FF unit cost as % of WMP</td>
<td>Import parity (value)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Steps in prioritizing performance-competitiveness drivers

The competitiveness framework includes three steps in prioritization of identified performance and competitiveness drivers.

Process

Keeping in mind what national-level policy and program interventions can realistically achieve is very important in regional strategy formulation. Analyzing the factors that can be controlled or influenced by participants in the APHCA project, and the limitations of policy action to influence some outcomes, and focus clearly on the opportunities for the next best step in each national (and regional) context. Project participants have a greater degree of influence and, potentially, control, over the conditions determining chain performance and smallholder participation.
and national market structures than over factors such as multinational firm strategies and the international trade system. As a result, the first step in prioritizing which performance and competitiveness drivers to address entails understanding whether opportunities and constraints can be controlled or influenced by government, by firms, those factors that are “quazi-controllable,” and those that cannot be controlled.

Step 1: What can we control through policy and program interventions?

The second and third steps in prioritization entails analyzing the drivers (identified above) to determine their relative influence on the competitive position of the value chain. This is accomplished by assessing their favorability or unfavorability to the smallholder dairy enterprise on a scale of -2 (Very unfavorable) to +2 (Very favorable), and assigning each issue a relative weight (importance) compared to other factors in a given category. Each category of issues (outlined in slide 9-10) represents a weight of 100%, and sub-factors are assigned a value reflecting their significance to the enterprise as a whole. By multiplying the favorability score by the weight, each sub-factor is assigned a positive or negative value, and the performance of the category as a whole can also be analyzed. The results for one category of drivers- Factor Conditions and Utilization- is illustrated in the table below which reviews the situation in Viet Nam.
Driver Evaluation Matrix: Vietnam Factor Conditions

<table>
<thead>
<tr>
<th>Performance/Competitiveness Drivers</th>
<th>Key Industry Issue</th>
<th>Controlability</th>
<th>Relevance</th>
<th>Weight</th>
<th>Drivers Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>herd</td>
<td>Unsufficient supply of cross-bred heifers</td>
<td>x</td>
<td>U</td>
<td>-1</td>
<td>0.05 -0.05</td>
</tr>
<tr>
<td>breed</td>
<td>Cross-bred heifers are expensive and starting dairy is risky for inexperienced smallholders</td>
<td>x</td>
<td>U</td>
<td>-1</td>
<td>0.10 -0.10</td>
</tr>
<tr>
<td>breed</td>
<td>High heat &amp; humidity in Vietnam lower the performances of the H-LS</td>
<td>x</td>
<td>U</td>
<td>-1</td>
<td>0.10 -0.10</td>
</tr>
<tr>
<td>feed</td>
<td>Lack of forages only partially solved.</td>
<td>V</td>
<td>U</td>
<td>-2</td>
<td>0.10 -0.05</td>
</tr>
<tr>
<td>feed</td>
<td>Recent considerable increase of industrial concentrates.</td>
<td>x</td>
<td>U</td>
<td>-1</td>
<td>0.05 -0.05</td>
</tr>
<tr>
<td>veterinary medicine</td>
<td>Apart maybe from southern Vietnam, poor availability of essential drugs for dairy (mastitis &amp; reproduction)</td>
<td>x</td>
<td>x</td>
<td>U</td>
<td>-1 0.05 -0.05</td>
</tr>
<tr>
<td>producer technical capacity</td>
<td>A very small number of producers have followed a good practical short-term training course on dairy production.</td>
<td>x</td>
<td>x</td>
<td>V</td>
<td>-2 0.10 -0.20</td>
</tr>
<tr>
<td>support services technical capacity</td>
<td>In locations with no international cooperation, smallholders are only advised by vets and inseminators. Vets have a low level of training and almost no continuing professional education is organized.</td>
<td>x</td>
<td>x</td>
<td>U</td>
<td>-1 0.05 -0.05</td>
</tr>
<tr>
<td>org &amp; managerial capacity</td>
<td>Lack of willingness from farmers to take leading roles and organize farmer's groups.</td>
<td>x</td>
<td>U</td>
<td>-1</td>
<td>0.05 -0.05</td>
</tr>
<tr>
<td>entrepreneurial capacity</td>
<td>As for other sectors in Vietnam, initial investment is very often too high in comparison to the funds that are put into the routine daily costs.</td>
<td>x</td>
<td>U</td>
<td>-1</td>
<td>0.05 -0.05</td>
</tr>
<tr>
<td>land supply &amp; utilization</td>
<td>Insufficient for smallholders</td>
<td>V</td>
<td>U</td>
<td>-2</td>
<td>0.10 -0.05</td>
</tr>
<tr>
<td>formal credit mechanisms</td>
<td>Credit has been available with the National Dairy policy and some dairy processing companies</td>
<td>x</td>
<td>X</td>
<td>V</td>
<td>2 0.10 0.20</td>
</tr>
<tr>
<td>informal credit mechanisms</td>
<td>Credit can be supplied by family relationships, other dairy farmer (in-kind) or collecting centers.</td>
<td>x</td>
<td>F</td>
<td>1</td>
<td>0.05 0.05</td>
</tr>
<tr>
<td>transmission of learning</td>
<td>Happens a lot from farmer to farmer.</td>
<td>x</td>
<td>F</td>
<td>1</td>
<td>0.05 0.05</td>
</tr>
<tr>
<td>social capital and trust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00 -0.60</td>
</tr>
</tbody>
</table>

Framework findings from value chain studies

The significant differences between the three countries studied are apparent in the chart below. According to this analysis, the challenges faced by each of the three countries differ significantly both within and across driver categories. While all three countries were reported to have favorable demand conditions, this was weighted as a much more positive factor in Viet Nam, in light of the country’s weaker dairy tradition. In all three countries, factor conditions and utilization were rated as a significant challenge. The studied countries diverged significantly with respect to the favorability of market structure and governance, related and supporting industries, and the regulatory and business enabling environment.
The most favorable sub-factors for each of the case study countries are presented below. While market size/growth and processing capacity are significant factors for both India and Vietnam, the Philippines’ market structure appears to be a much significant strength upon which to build than in either India or Vietnam.

Most Favorable Competitiveness Drivers in 3 Countries

With respect to the greatest challenges identified in these case studies, there was almost no consistency of the most highly weighted factors across the three countries. This result reinforces the conclusion that it will be more effective for groups of countries facing similar challenges to work together within the project framework to achieve sustained upgrading and find solutions to common challenges.
Evaluating model effectiveness

Evaluating and choosing models to scale up and/or replicate requires understanding what a particular model addresses well, and also a recognition that there may not yet be an appropriate model developed to overcome specific challenges or take advantage of current opportunities. The most fundamental question considered in the model evaluation step is, “whether a particular model responds effectively to the specific, high-priority challenges and opportunities that smallholder dairy faces in my country’s environment?” The framework uses a relatively simple scoring system to address this question.

Models effectiveness in addressing a few of the key opportunities and challenges is illustrated in the table. Two groups of issues are apparent. First, in four cases, where significant opportunities or challenges have been identified, at least one of the models offers a “very effective” or “somewhat effective” example of how to address the issue. These are shown in the top section of the table. In four other cases, significant challenges in the operating environment have been identified, but there is no clear evidence that the models examined have been effective in addressing these issues. Where this is the case, further innovation, rather than scaling up of current models, should be considered, and project participants may find the APHCA project an effective vehicle for working together to catalyze this innovation, whether it comes from policy, program, or private-sector initiatives.
Rating Models' Effectiveness: India examples

<table>
<thead>
<tr>
<th>Key Issues</th>
<th>Drivers</th>
<th>Score Co-operative Union</th>
<th>Score MACS Society</th>
<th>“-” Private Dairy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size and growth</td>
<td>Market growth due to high per capita consumption and increasing population</td>
<td>0.6 4</td>
<td>Not much investment in developing milk procurement to meet future high demand</td>
<td>1 Developing a village level infrastructure to meet future high demand</td>
</tr>
<tr>
<td>Performance</td>
<td>Milk share of milk 10% of marketable surplus goes through traditional channel</td>
<td>-0.3 4</td>
<td>Not been able to undercut the traditional market</td>
<td>1 Doing competition to traditional channel by strengthening societies</td>
</tr>
<tr>
<td>Processing Capacity</td>
<td>Need to enhance capacity for processing and bulk chilling</td>
<td>-0.4 3</td>
<td>Has a strong processing and primary processing infrastructure</td>
<td>2 Has strong processing and primary processing infrastructure</td>
</tr>
<tr>
<td>Price Regulation</td>
<td>Price regulation by cooperatives</td>
<td>-0.4 4</td>
<td>Has to follow the price regulation norms of the co-operatives hence cannot give farmers better price</td>
<td>2 Has the flexibility to higher prices to farmers</td>
</tr>
</tbody>
</table>

Models do not address key drivers: need for further innovation

| Consumption patterns | | | | |
| Producer services | | | | |
| Specialized finance & credit | | | | |
| Processing Capacity | | | | |

Model Scoring Key
(1) Very effective in addressing this key industry issue;
(2) Somewhat effective in addressing this key industry issue;
(3) Unclear or neutral effectiveness in addressing this key industry issue;
(4) Somewhat ineffective in addressing this key industry issue;
(5) Very ineffective or counterproductive in addressing this key industry issue.

The rural wage rate as a determinant of smallholder dairy trajectory

So far, our analysis of smallholder dairy competitiveness has looked at the system almost exclusively from the “inside”-- that is, from the perspective of upgrading what currently exists and assuming, rightly in most cases, that the performance of the smallholder dairy system can be improved if challenges are addressed appropriately and if the smallholder enterprise is organized to take advantage of opportunities. One factor that may be an overriding determinant of the trajectory (direction, likely future development path) of smallholder dairy is the evolution of rural wage rates. This work is based on an ongoing research program at ILRI and the work of Steve Stahl, who could not be with us today. It suggests that the rural wage rate context has been a key determinant of the scale at which dairy activities can be competitive. Rising rural wage rates make other activities more attractive and may tend to divert smallholders away from dairy enterprise. Dairy also becomes less attractive when non-financial benefits of dairying are reduced as mixed-crop farming declines. Considering these issues can help you target resources within your country more effectively and with a greater awareness of how rural economic development impacts the smallholder enterprise.

Some research has demonstrated that the attractiveness of smallholder dairy as a remunerative option declines quickly with rising rural wage rates. The basic outline of this argument, as presented resulting from a trans-regional study conducted in the late 1990s, provides some important insight into anticipating industry trajectories.

1) Smallholder dairy is labor intensive and arises where other remunerative options for labor are small. Dairy competitiveness reli(ed) on low opportunity cost for labor.
Dairy Herds Grow as Rural Wage Rates Rise

2) **Herd sizes rise with rising rural wage rates** and greater access to remunerative opportunities for family labor. When wages rise, smallholders may respond with capital investment, either in land for grazing (as an alternative to labor-intensive fodder), milking equipment, or other upgrades that reduce labor inputs, but also require economies of scale for profitability and sustainability. As a result, smallholder production may transition to more specialized, **small commercial** production in the context of rising rural wages.

3) **High value of manure as fertilizer input**, particularly in dense, low-yield subsistence environment(s), sustains smallholder dairying. In Kenya, researchers found that the value of manure produced in a small dairy farm may be <30% of the value of milk produced, based on the observed market values for both (Lekasi et al. 1998). Benefits from manure erode where wages are higher (or rise) because manure handling is a labor-intensive process.

4) **Dairy provides savings and capital accumulation** mechanisms for smallholders which may lose attractiveness as other formal-sector options become more widely available.

In the context of rising rural wage rates, it may be difficult for smallholders to remain competitive in dairy, since (1) some smallholders will abandon the hard work of feeding and milking cows and pursue other types of work, if these opportunities are available, and (2) those who do stay in dairy shift towards a different model of production that is more concerned with cash remuneration rather than the various forms of income and asset building that makes dairy attractive to smallholders in a mixed-crop environment.

The attractiveness of dairying as a remunerative activity appears to depend on low labor opportunity costs (as represented by low rural wage rates) and lack of access to other savings and investment vehicles. **Where opportunities for other use of labor are low, and where soil nutrients and land are scarce**, smallholder mixed dairy producers successfully out-compete larger more specialized producers locally because they require lower formal financial returns from sale of milk.
Smallholders and commercial producers view economic returns differently

<table>
<thead>
<tr>
<th>Economic returns on dairy production: smallholder and small commercial producers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returns from Milk</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Other Returns</td>
</tr>
<tr>
<td>Fertilizer (manure)</td>
</tr>
<tr>
<td>Improved land productivity</td>
</tr>
<tr>
<td>Savings/ Investment</td>
</tr>
<tr>
<td>Costs</td>
</tr>
<tr>
<td>Fodder costs</td>
</tr>
<tr>
<td>Capital costs</td>
</tr>
</tbody>
</table>

The implication of this analysis suggests that “next steps” for smallholders should be considered very carefully with respect to the rural wage context. Where rural wages are moving towards convergence with urban wages (though these cases may be somewhat rare), it is likely that the value of ‘other returns’ to milk production will decline (particularly manure), reducing both the competitiveness and the desirability of smallholder dairy production.

In these cases, encouraging smallholder strategies may be less favorable than considering other forms of local dairy enterprise development in which smallholders can participate, focusing on those that can reap the economies of scale required to make dairy a favorable option in a higher rural wage context.

A variety of likely and potentially appropriate growth trajectories, summarized in this table, should be considered after analyzing the competitiveness of the dairy production system and prior to selecting appropriate models to adopt. In this table, the rural wage context is considered alongside smallholder market access conditions to suggest 15 different scenarios for appropriate strategy development.
Different Strategies are appropriate in varying rural wage and smallholder access conditions

<table>
<thead>
<tr>
<th>Rural Wage Rate</th>
<th>Smallholder Market Access/Participation</th>
<th>Greater expected opportunities for Smallholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Urban Wage</td>
<td>High % market</td>
<td>Marginal % market</td>
</tr>
<tr>
<td>Low. Stagnant</td>
<td>1. Sustainability and improvement of smallholder enterprise through on-farm productivity improvements.</td>
<td>3. Development and basic participation of smallholder enterprise: marketing chain access, basic collection infrastructure.</td>
</tr>
<tr>
<td></td>
<td>2. Sustainability and improved participation of smallholder enterprise: improvement of market access: improved collection infrastructure and improved linkages.</td>
<td></td>
</tr>
<tr>
<td>Low. Growing</td>
<td>5. Irremovable consolidation: Enterprise (or co-op) development focused on intensification, transition to small commercial, including capital resources and economies of scale.</td>
<td>6. Smallholder viability in doubt. Expected consolidations/intensification. Selective enterprise development: basic market chain participation through linkages with larger enterprises.</td>
</tr>
<tr>
<td>Medium Stagnant</td>
<td>4. Irremovable consolidation: Enterprise (or co-op) development to cope with intensification, improved market chain participation/Access.</td>
<td></td>
</tr>
<tr>
<td>Medium Growing</td>
<td>8. Irremovable role for smallholders. Assumed prevalence of commercial or co-op enterprises (intensification). Focus on enterprise development, productivity, technology.</td>
<td>9. Assumed that local production viability is low. Smallholder participation possible. Focus on analysis of limited opportunities for smallholder participation, linkages with larger enterprises.</td>
</tr>
<tr>
<td>High % Urban wage</td>
<td>10. Any remaining smallholders threatened: Focus on intensification/transition to commercial enterprises through enhanced credit and technology extension.</td>
<td>11. Any remaining smallholders threatened: Simultaneous focus on commercial enterprise development for intensification and market chain access. Linkages to lead firms important.</td>
</tr>
<tr>
<td></td>
<td>13. Very limited opportunity for smallholders. Enterprise improvement (productivity, technology), scale, export opportunities for commercial enterprises.</td>
<td>15. Assumed that local production viability is low. Smallholder participation unlikely. Poor prospects. Focus on analysis of small commercial opportunities, linkages with larger enterprises.</td>
</tr>
<tr>
<td></td>
<td>14. Enterprise improvement (productivity, technology), formalization and improvement of linkages for small commercial enterprise success.</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions and next steps

The measure of whether this framework is useful is whether you and your collaborators in-country find it to be of value. As a result, we hope that you will provide input into this “work in progress.”

In addition, another of the project’s goals is to develop an internet-based (online) or software-based system that allows you to search for models that have been effective in addressing specific constraints or challenges. This goal is one reason it has been important to standardize the categories in which the main performance-competitiveness challenges of different countries are captured in the framework analysis.
The Process: To better understand the process for ranking factors favourable/non-favourable to industry development, participants were asked to complete a worksheet exercise which reviewed the standard set of performance/competitiveness drivers that fall into five areas:

1. Demand conditions,
2. Factors of production and utilization,
3. Market and competitive structure,
4. Related and supporting industries, including producer services; and
5. Government and business enabling environment.

### Driver Categories with Sub-Factors

<table>
<thead>
<tr>
<th>Demand Conditions</th>
<th>Market Structure &amp; Governance</th>
<th>Factor Conditions</th>
<th>Related and Supporting Industries</th>
<th>Business Enabling Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size and growth</td>
<td>Domestic Market</td>
<td>Herd</td>
<td>Value-Added Processing</td>
<td>National</td>
</tr>
<tr>
<td>Consumption patterns</td>
<td>Governance</td>
<td>Breed</td>
<td>Transportation and Distribution</td>
<td>Sector Regulation</td>
</tr>
<tr>
<td>Sophistication of consumers</td>
<td>Market Chain</td>
<td>Human Capacity</td>
<td>Producer services</td>
<td>Formal sector support</td>
</tr>
<tr>
<td>Receptivity to new products</td>
<td>Lead Firms</td>
<td>Distribution-Infra Capacity</td>
<td>Specialized inputs</td>
<td>Provincial/Local</td>
</tr>
<tr>
<td>Price elasticity</td>
<td>Barriers to Entry &amp; Rents</td>
<td>Processing</td>
<td>Specialized finance &amp; credit</td>
<td>Formal Private Governance</td>
</tr>
<tr>
<td>Impact of market opening and imports on local demand</td>
<td>International Market</td>
<td>Land Supply &amp; Utilization</td>
<td>Relevant research capacity &amp; utilization</td>
<td>Donor/NGO</td>
</tr>
</tbody>
</table>

1. Participants were first asked to individually highlight in green those factors most favourable for industry development in their respective country and describe the most important industry issue for that factor. The data was then collected for analysis and presented to the group.
2. Participants were then asked to work in groups to complete a series of ‘self-assessment worksheets’ on competitiveness drivers.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Philippines</td>
<td>Bangladesh</td>
</tr>
<tr>
<td>India</td>
<td>Thailand</td>
<td>Mongolia</td>
</tr>
<tr>
<td>Samoa</td>
<td>Malaysia</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Facilitator: Meeta</td>
<td>Facilitator: Sally</td>
<td>Facilitator: Brian</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 4</th>
<th>Group 5</th>
<th>Group 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sri Lanka</td>
<td>Myanmar</td>
<td>Iran</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>Nepal</td>
<td>Viet Nam</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Bhutan</td>
<td>Facilitator: Patrice</td>
</tr>
<tr>
<td>Facilitator: David</td>
<td>Facilitator: Nancy</td>
<td>Facilitator: Nancy</td>
</tr>
</tbody>
</table>
1. The results from the rating exercise, using the individual factors listed under the competitiveness drives above, were presented and reviewed. The individual results, even from participants from the same country, showed considerable diversity in their rankings. This could perhaps be explained by unfamiliarity with the terms or confusion about the ranking/rating process.

2. The following slide aggregates the responses from all the participants and ranks all specific sub-issues from the most to least favourable (unweighted averages).

In summary:

**Demand conditions**

Almost all respondents rated conditions as favourable, with considerable opportunities offered by strongly favourable market size and growth potential. There appeared to be a consensus that one constraint facing the industry was consumer’s receptivity to new products, perhaps linked to the sophistication of consumers. Strong demand conditions were particularly ranked highly by Viet Nam, India, Pakistan, Afghanistan, and Iran. This contrasted to concerns expressed by representatives from Bangladesh, Sri Lanka, Mongolia and Samoa.

**Market structure**

The ranking on this driver were more diverse with more countries identifying more constraints: in particular those related to competition from international markets and barriers to entry.

**Factor conditions**

Surprisingly, most countries reported extremely positive conditions, particularly to those related to herd numbers. Not so positively ranked were breed availability and land supply and utilization.
Related and supporting industries

This driver, which reflects outside resources which are supportive of industry development, is typically a feature of more advanced value chains. Not surprising, however, there was considerable variation in the results. The Philippines, Viet Nam, Bangladesh, Nepal, and Iran ranked high for this driver, however, some of the results weren’t intuitive with India and Pakistan ranking this driver very low. Within the general category, value-added processing, transportantion and distribution, and producer services were ranked high, while specialized input and finance and credit were negative.

Business enabling environment

Ranking by participants indicate that factors conducive to investment in the dairy sector appear to be supported by strong donor/NGO support and adequate governance in private sector operations. However, formal sector support was only reported in the Philippines with most countries indicating that the sector, in general, lacks effective regulations, both on the national and the provincial and local level.
Theme 2: Dairy markets and the facilitation of smallholder participation along the producer-consumer value chain

Selected smallholder dairying experiences from Bangladesh and Mongolia

Tsetsgee Ser-Od, Mongolia
Md. Mustafa Hussain, Bangladesh
Brian Dugdill, Dairy Development Specialist

Introduction

FAO recently completed two smallholder-based dairy development projects in Bangladesh and Mongolia. At first glance the countries and the projects are vastly different and could not be further apart from, for example, a population density or climate standpoint. In fact there are many similarities from a smallholder dairying perspective.

This paper compares and contrasts smallholder dairying in the two countries with a focus on two quite different, but innovative models. Both models have been developed and adapted to produce quality milk from available local resources, at a profit for smallholders and, at affordable prices for urban consumers, including lower-income families. The paper also draws on the lessons learned studies carried out by national experts under the project in the two countries and the Terminal Reports for the two FAO projects.

Milk production

Some basic comparative facts and figures for the two countries and the farming and dairy production systems are summarized in table 1. In Bangladesh, where land is a serious constraint, smallholders stall feed their cows (and buffaloes) at home. In Mongolia, where land is plentiful, nearly all the animals milked (cows, yaks, horses, camels, goats and sheep) graze the steppe and are constantly on the move, even in winter. The key constraints to improving productively and profitability are the same, namely: (i) enhanced feeding (ii) shortage of improved stock and (iii) insufficient knowledge for raising management skills.

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6 Lessons Learned Study. Bangladesh: smallholder milk producers, nutrition, incomes and jobs. S.A.M. Anwarul Haque, former General Manager, Bangladesh Milk Producers’ Cooperative Limited (Mil Vita)
Lessons Learned Study. Mongolia: small milk producers – the key to dairy industry revival. Tsetsgee Ser-Od, Director, National Dairy Programme (October 2007)

7 Terminal Report. Grameen Bank/UNDP/FAO Community Livestock and Dairy Development Project (BGD/98/009), Bangladesh (September 2007)
Terminal Report. Mongolia/Japan/FAO project: Increasing the supply of dairy products to urban centres in Mongolia by reducing post-harvest losses and restocking (GCSP/MON/001/JPN), (August 2007).
Table 1: Selected comparative facts and figures

<table>
<thead>
<tr>
<th>Item</th>
<th>Bangladesh</th>
<th>Mongolia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>140 million</td>
<td>2.5 million</td>
</tr>
<tr>
<td>Population density</td>
<td>1,000 per km²</td>
<td>1.6 per km²</td>
</tr>
<tr>
<td>Poverty &amp; nutrition</td>
<td>slightly above MDG poverty line</td>
<td>slightly below MDG poverty line</td>
</tr>
<tr>
<td>(1/day)</td>
<td>30% - under-nourished</td>
<td>20% - under-nourished</td>
</tr>
<tr>
<td>+ 30% - real unemployment</td>
<td></td>
<td>+ 30% - real unemployment</td>
</tr>
<tr>
<td>Climate</td>
<td>Hot, humid, tropical</td>
<td>Cold, semi-arid, extreme continental</td>
</tr>
<tr>
<td>Natural disaster risk</td>
<td>High: prone to regular flooding</td>
<td>Medium: prone to periodic dzuds</td>
</tr>
<tr>
<td>and tsunamis</td>
<td></td>
<td>&amp; droughts</td>
</tr>
<tr>
<td>Topography &amp; soil</td>
<td>Flat, alluvial, very fertile,</td>
<td>Undulating steppe, mountains</td>
</tr>
<tr>
<td></td>
<td>abundant water</td>
<td>rising above 4,000m, poor soils,</td>
</tr>
<tr>
<td></td>
<td>3 rice crops/yr</td>
<td>frequent droughts; short 90</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Crop-based</td>
<td>Livestock-based</td>
</tr>
<tr>
<td></td>
<td>21% of GDP (livestock 6% - when</td>
<td>22% of GDP (livestock 81%)</td>
</tr>
<tr>
<td></td>
<td>manure, hides, skins etc counted</td>
<td>Agri exports</td>
</tr>
<tr>
<td></td>
<td>Employment: 52%</td>
<td>Employment: 40%</td>
</tr>
<tr>
<td>Farming systems</td>
<td>Mainly subsistence</td>
<td>Mainly subsistence</td>
</tr>
<tr>
<td></td>
<td>Paddy (rice)</td>
<td>Nomadic herding</td>
</tr>
<tr>
<td></td>
<td>Crop-vegetables</td>
<td>Crop (wheat/vegetables)</td>
</tr>
<tr>
<td></td>
<td>Paddy-livestock</td>
<td>Crop-livestock</td>
</tr>
<tr>
<td></td>
<td>Paddy-fish-livestock</td>
<td>More intensive dairy (recent)</td>
</tr>
<tr>
<td></td>
<td>Small scale dairy</td>
<td></td>
</tr>
<tr>
<td>2. Milk production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk availability</td>
<td>19 kg per capita</td>
<td>134 kg per capita (rural 200 kg</td>
</tr>
<tr>
<td></td>
<td>Imports - ? per capita</td>
<td>/ urban 50 kg)</td>
</tr>
<tr>
<td></td>
<td>50% formal market</td>
<td>Imports - 20 kg per capita</td>
</tr>
<tr>
<td>Milk animal</td>
<td>Cattle, buffaloes (22 million)</td>
<td>Total – 40.1 million</td>
</tr>
<tr>
<td>Smallholder families with</td>
<td>15 million households</td>
<td>Cattle, yaks, horse, camels,</td>
</tr>
<tr>
<td>milk animals</td>
<td></td>
<td>goats, sheep</td>
</tr>
<tr>
<td>Ave. milk production (cow)</td>
<td>200-300 per 180 day lactation</td>
<td>5-8 kg. day</td>
</tr>
<tr>
<td></td>
<td>Good milk yield for improved</td>
<td>Improving with AI &amp; on</td>
</tr>
<tr>
<td></td>
<td>cattle (10-25 kg)</td>
<td>specialized dairy farms</td>
</tr>
<tr>
<td>Services</td>
<td>Vet. /Breeding (AI): poor</td>
<td>Vet. /Breeding: good coverage -</td>
</tr>
<tr>
<td></td>
<td>coverage - delivered</td>
<td>delivered by private sector</td>
</tr>
<tr>
<td></td>
<td>mainly by Government.</td>
<td>sector vets &amp; AI technicians.</td>
</tr>
<tr>
<td></td>
<td>Where dairies have set up their</td>
<td>Dairy cow gen</td>
</tr>
<tr>
<td></td>
<td>own support services systems</td>
<td>etic. Dairy cow</td>
</tr>
<tr>
<td></td>
<td>coverage good. Credit: readily</td>
<td>genetic Credit expensive (+30%</td>
</tr>
<tr>
<td></td>
<td>available (20% pa interest).</td>
<td>interest pa) &amp; difficult to get</td>
</tr>
<tr>
<td>3. Producer Organisations</td>
<td>2-tier dairy cooperative (150,</td>
<td>Dairy herder dairy groups (20-40</td>
</tr>
<tr>
<td></td>
<td>000 families in 1,200 village</td>
<td>families)</td>
</tr>
<tr>
<td></td>
<td>coops)</td>
<td>Single-tier dairy cooperative</td>
</tr>
<tr>
<td></td>
<td>CLDPP women’s groups (8,000</td>
<td>(40 families)</td>
</tr>
<tr>
<td></td>
<td>families in ?? Village Groups)</td>
<td></td>
</tr>
<tr>
<td>4. Markets access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market type</td>
<td>Huge</td>
<td>Small</td>
</tr>
<tr>
<td></td>
<td>Mainly informal</td>
<td>Rural areas informal, urban</td>
</tr>
<tr>
<td></td>
<td>Low rural &amp; urban purchasing</td>
<td>increasingly formal</td>
</tr>
<tr>
<td></td>
<td>power. Milk producers relatively</td>
<td>Rapidly increasing urban</td>
</tr>
<tr>
<td></td>
<td>close to urban markets</td>
<td>purchasing power</td>
</tr>
<tr>
<td>Dairy enterprises</td>
<td>Since mid-1990s, more than 20</td>
<td>12 milk processors: 2 with</td>
</tr>
<tr>
<td></td>
<td>investors set up dairy</td>
<td>business models based on</td>
</tr>
<tr>
<td></td>
<td>companies, of which 75% use</td>
<td>recombining veg. oil &amp; SMP</td>
</tr>
<tr>
<td></td>
<td>local milk</td>
<td></td>
</tr>
</tbody>
</table>
Mongolia

Because of the harsh environment and vast grasslands (only one percent of the country is settled or cropped) livestock are hugely important in what was, until very recently, a predominantly nomadic culture. Milk is sacred and milk and dairy products are staple foods and produced in great abundance from 40 million cattle, yaks, camels, horses, goats and sheep. Prior to 1990 during the socialist period, Mongolia used to be self-sufficient in milk. Under the socialist system the country had 42 collective dairy farms with improved dairy animals, state-run milk and butter collection networks, and a large state-run processing plant in Ulaanbaatar, the capital. The state system produced enough processed milk and dairy products for the entire urban population, even though 80 percent of the milk is produced in the short June-August growing period.

During the rapid transition to the market-based economy in the 1990s the dairy industry, like other food industries collapsed. By 2002 most of the processed milk sold in urban areas was imported. The industry was characterised by obsolete infrastructure and technologies, a chronic shortage of trained people and consumer concern about the quality and safety of Mongolian milk and dairy products. Like other countries in the East Asia region, Mongolia is rapidly urbanising and domestic products need to be tailored to modern market tastes. In 2002 Mongolia turned to the Government of Japan and FAO for support to revive the dairy sector. Accordingly, a project was developed: Increasing the supply of dairy products in Mongolia by reducing post-harvest losses and re-stocking with a budget of US$ 2 million, provided by the Government of Japan from its Kennedy Round II facility. The project started in October 2004 and was completed on schedule and on budget in September 2007. Following intensive stakeholder consultations a strategy was developed to re-build and modernise the dairy sector using a sector-wide, cow to consumer approach involving public and private sector partnerships. Previous attempts to revive the sector under the white revolution programme had failed, largely due to resource constraints

The Mongolia dairy food chain model

The modern dairy food chain model evolved from the lessons learned during the dairy food security project, and is inclusive of all milk producers, irrespective of type and size (nomads, peri-urban households, small dairy farms etc). The model links producers to small, medium and large scale processors through six flexible modules, one for each link in the cow-consumer dairy food chain, each capable of being adapted to the local situation and each of which must be profitable. The modules include: (i) milk producer organisations, (ii) dairy service centres, operated on a full cost recovery basis by private vets., (iii) milk collection units, (iv) milk cooling centres, (v) milk processing units and (vi) “One-Stop” milk sales centres.

While the basic model centres on liquid milk, for more remote areas the model is adapted for primary processing out on the steppe for conservation and reduced transport costs, e.g. cheese production. The market in Mongolia and the region is for processed cheese, mainly for fast food outlets. Yak cheese is produced by herder groups, matured and collected. Best quality is sold vacuum packed as natural cheese, the remainder is converted into processed cheese, which has a longer shelf-life and is easier to store and transport.

In addition to the sector-wide strategy, both models are supported by innovative marketing and capacity building features including:

- Public-private sector partnerships and investments in the modules.
- A dairy cow genetic breed improvement scheme, using imported semen from young tested Simmental bulls.
- Generic milk branding, labelling and advertising (the first generic branding and advertising campaign in Mongolia).
- Retail outlets where processors join to sell their products, including certified raw chilled milk and traditional products at “one-stop” milk sales centres,
- An innovative public-private sector partnership school lunch programme based on local milk, supplied by local milk producers and dairy enterprises.
- Working with the food standards and inspection authorities to set realistic but safe standards and to train and certify milk inspectors, dairy operators and traders.
- A permanent and commercial National Dairy Training Centre at the Food Technology College in Ulaanbaatar, which provides practical, vocational and outreach/field training for each of the modules.
- Forming a Dairy Steering Group under the Mongolian Food Processors Association to and to represent and promote the dairy industry.

The two models are now mainstreamed into the 10-year National Dairy Programme for the period 2007-2016. The target is to produce and process at least 90 percent of the milk sold in the formal market locally by 2010, up from 2.5 percent in 2003.

At 134 kg per person per year, milk availability in Mongolia is high by Asian standards; even so, with just 2.5 million people, half of who live in urban areas, the market is very small relative to the country’s potential and comparative advantage for producing ‘clean’ milk. With its huge milking herds and vast grasslands, Mongolia has a clear international comparative advantage for producing and exporting clean milk to ecologically-conscious markets; hardly any pesticides or animal drugs and no milk-stimulating hormones are used. Having substituted the vast majority of imports with domestic milk, the next step is to look to exporting quality, niche products to the rapidly growing markets of milk-deficit countries in the region to continue to grow the dairy industry. Processed cheese will be one of these products.

Initial results have been encouraging. By the end of 2007, sixteen commercial modules/units are in operation. The project shared the investment risks with its partners by contributing up-to-date know-how and limited equipment (approx. USD 350,000). The partners invested about USD 1.3 million in equipment and buildings. The quantity of domestic milk entering the formal market in 2007 was 16 million litres, up from 2.5 million litres in 2003. This is expected to increase to 24 million litres in 2008. Under the National Dairy Programme private investors, including the two companies reconstituting imported FCMP, are expected to invest upwards of USD 10 million in the modules in 2008 and 2009.

**Bangladesh**

Prior to 1970 there was no organised dairying in Bangladesh. Acute scarcity of milk following independence from Pakistan in 1971 prompted the Government to plan a dairy project modelled on the world-renowned Indian Anand pattern dairy cooperative. Set up with support from FAO, UNDP and DANIDA, the Bangladesh Milk Producers’ Cooperative Union Limited (Milk Vita) today collects milk from over 150,000 smallholder milk producers through a network of 1,200 village cooperatives. Milk Vita almost collapsed in the early 1980s because it could not compete with imported subsidized milk powder, donated and commercial, mainly from the European Union. By the early 1990s the business had been turned around when Government withdrew from day-to day management and allowed Milk Vita to recruit professional managers. At the same time milk powder stocks around the world started to drop as western Governments began to withdraw subsidies to their dairy farmers and exporters. A number of private sector investors and NGOs copied parts of the Milk Vita model and by 2005, there were 20 or so dairy enterprises, including three large companies producing sweetened condensed milk from imported skimmed milk powder and vegetable oil. Milk Vita recently invested more than USD 10 million in an expansion programme, which is facing teething problems related mainly to inappropriate equipment selection.
FAO and UNDP also provided support to set up a vocational Dairy Training Centre to support the dairy expansion programme and to prepare an updated National Livestock Policy (NLP) in 2006. The National Strategy for Accelerated Poverty Reduction (NSAPR), published in October 2005, sets out ways and means for achieving the Millennium Development Goals (MDG) of halving poverty and under-nutrition by 2015. It indicates that while the livestock sector as a whole grew 2.6 percent per annum since the 1970s, poultry and milk production grew at around 10 percent per annum, reflecting the significant support for the two sectors. Not surprisingly both the NLP and NSAPR single out smallholder dairying for early adoption and replication. While milk production by smallholders is now generally recognised in Government development strategy, the absence of a comprehensive national dairy programme is thought by dairy sector insiders to have limited growth.

The Grameen CLDDP (Community Livestock & Dairy Development Project) model

One of the NGOs to adapt parts of the Milk Vita Cooperative dairy model was the Grameen Motsho (Fish) Foundation. The Foundation is a non-profit organisation under the Grameen Bank, world renowned for its highly innovative and successful micro-credit programme for very poor people. The Foundation was set up in 1986 and by 1998 was farming over 1,000 small ponds in partnership with 3,000 poor families in the north-west of the country. It works through a grass roots Village Group-Village Centre structure, supported by service units. The profits from fish sales are shared 50:50 by the Foundation and the VGMs (Village Group Members). By the late 1990s, earnings per VGM had levelled off at around USD 70 per year. The Foundation was looking for ways and means to: (i) increase pond operator earnings, (ii) raise the productivity of its fish ponds and (iii) improve the nutritional status of VGMs and their families, while involving more direct women beneficiaries, as over 90 percent of the VGMs were men. The solution was to add livestock to the fish farming system in order: (i) to make available food for home consumption and sale (ii) to provide dung to fertilise fish ponds to improve productivity and (iii) to shift the focus to women. The Foundation turned to FAO and UNDP for support in 1998 and the project started in 1999. It was completed in 2006. The budget was USD 3.43 million, provided by the Foundation and UNDP, including USD 0.82 million for the revolving community micro-credit scheme.

The Grameen CLDDP model is profitable dairy chain model that is part of an integrated, community-owned crop-fish-livestock farming system. Over 8,000 very poor landless and assetless VGMs belong to five-person groups. Following training and build up of savings, the VGMs access small commercial loans for livestock and other income generating activities. Loans may be accessed for in-calf heifers, in-calf cows, store cattle for fattening, goats, pigs, poultry, ducks crops/fodder, milkshaws, and bio-digesters and more recently, vegetables, fishing gear, social forestry. More than seventy percent of the loans are now for dairy cows because they return the most in terms of profits, nutrition, asset accumulation and social standing. The loans include compulsory animal insurance and a feed component with feed produced by their own feed mills.

VGMs have access, at full cost, to all the inputs and services needed to produce and market milk, e.g. feed, AI, animal health, credit etc. They supply milk surplus to their household requirements to community-owned milk collection centres for primary processing at community-owned dairy enterprises. Because of its reliable quality, chilled milk is sold at a premium price to established dairies such as Milk Vita, Bikrampur Dairy and Grameen-Danone Foods for further processing and marketing. Some milk is processed and marked locally using a low-cost, locally fabricated in-pouch filling-pasteurising-cooling system. This equipment was also exported to Mongolia for used by small and medium-scale dairy enterprises.

The community-owned feed mill enterprises provide quality dairy rations, compounded from locally available agro by-products, for the VGM-owners who either have insufficient land or no land at all to grow their own feed and fodder. Once smallholders have four or five cattle, they have enough dung to
take out a loan for a bio-digester to produce gas for cooking and lighting. The spent slurry from the bio-digester is then used to fertilise and increase the productivity of fish ponds. Every two or three years the ponds are emptied, the slurry dried and used as crop fertiliser. In this way smallholder dairying has become an important component of an integrated and environmentally sustainable poor peoples’ farming system.

The VGM-smallholder milk producers own 70 percent of the community feed mills and dairy enterprises (Grameen owns the other 30 percent) and thus share the profits of the enterprises. While in some ways it is a social dairying model, it is commercial in operation.

Some of the benefits for smallholders include:

Nutrition: e.g. pre-project no households consumed milk, now all 6,000 households with cows consume between 0.2 and one litre daily.

Earnings: e.g. average earnings from fish and milk increased from 19 to 125 US cents a day, enabling purchase of other essentials such as food, schooling, clothes etc.

Household accumulation of physical assets: up 145 percent and include tube wells for safe water, bio-digesters for clean cooking and lighting, sanitary latrines etc.

So far these benefits\(^8\) have resulted in the graduation of over 5,000 smallholder households out of poverty. The model is being adapted and scaled up across the country and in Nepal. The new Grameen-Danone Foods\(^9\) Bogra Dairy started up in 2007 and produces low-cost bio-yoghurts for the poor. In five very poor districts in the north-west 10,000 smallholder families will be covered under a USD 15 million programme, funded up to 2010 and managed by the NGO, Palli Karma-Sahayak Foundation.

**School milk**

Both countries have school milk programmes. The Bangladesh programme is quite small and operated by an International NGO. Originally the milk was imported, pre-packed in UHT cartons from Thailand. Now imported milk powder is reconstituted in a joint venture with a local dairy. The above-mentioned National Strategy for Accelerated Poverty Reduction includes a plan to promote a School Lunch Programme to improve attendance, reduce incidence of mal-nutrition as well as generating demand for local produce and catering services through backward and forward linkages. Community participation is to be a key driver.

In Mongolia the Government launched a school lunch scheme in 2006. The scheme is operated under a public-private sector partnership arrangement with food companies bidding for local school lunch contracts. Following intense lobbying by the Mongolian Food Industry Association and the dairy project the Government now insists that only domestic produce is used. 80 percent of the meals are now provided by dairy enterprises. Different dairy products are provided on alternate days and the scheme boosts cash flow and earnings for the concerned dairies and, in turn, milk producers. The school lunch/milk programme is linked to the generic Mongolia milk advertising campaign.

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\(^8\) Data from baseline survey (1999) and monthly monitoring and evaluation reports (2000-2007)

\(^9\) Grameen-Danone Foods Limited was set up in 2006 and is in a joint social venture between the Grameen Bank and Danone, a large French multi-national dairy corporation known for its functional bio-yoghurts. Danone recently established a division named DanoneCommunities and gained approval from its shareholders to set up a Euro 50 million (USD 70 million) mutual fund to channel investment into not-for-profit social ventures in developing countries. Ninety percent of the fund is to be invested in low risk securities, the remaining ten percent in higher risk social ventures. The first social venture is Grameen-Danone Foods, which produces low-cost, fortified yoghurt for sale in rural communities. A pilot dairy enterprise has been set up in Bogra. The longer-term plan is to set up a further ten rural enterprises in other disadvantaged areas of Bangladesh. The Bogra enterprise started up in February this year and currently purchases about 300 to 400 litres of milk daily from the Grameen/CLDDP Community Dairy enterprise at Nimgatchi, about 50 km away.
In addition to supplying regular nutrition, the scheme also show-cases Mongolian milk and dairy products to tomorrow’s customers. The scheme current covers about 200,000 primary school children across the country.

Dairy development programmes and scaling up the models

The two countries have different approaches to dairy development reflecting, perhaps, the relative importance of milk to the economy and nutrition. Milk is a staple food in Mongolia and so there is now a fully funded National Dairy Programme involving public-private sector partnerships for scaling up the models (see paras 10 and 11). In Bangladesh milk is just one of many foods important for human nutrition. However, the project demonstrates how dairy can be converted into an integral part of the community. This is despite that there are no specific national dairy plans or programmes and dairy development is driven largely by the private and NGO sectors (para 13).

Lessons and conclusions

Milk is nature’s most complete food. With appropriate policies, strategies and planning, smallholder dairying can improve the livelihoods and well-being of rural communities and urban consumers alike while making profits for the dairy operators at each stage of the dairy value chain. Smallholder dairying is simple in vision, but relatively complex in implementation.

If smallholder dairying works in such harsh and differing environments as Bangladesh and Mongolia, it should work in most between situations where markets demand quality milk and dairy products and smallholders produce milk competitively. In Bangladesh and Mongolia these countries success was achieved by:

- building on existing farming systems and structures, but focussed on the private sector;
- adapting and tailoring modern dairy technologies and models to the local situation – each situation is unique;
- adopting a complete cow to consumer strategy and intervening at each stage of the dairy food chain to ensure that each stage maintains milk quality and is profitable;
- having a project to demonstrate and fine tune the model to minimise the initial risks associated with innovation and start-up;
- using the success to influence policy making and to plan sustainable scaling up through national programmes.

In these processes, committed people and enterprises (stakeholders) are more important than geography, climate or politics.

Smallholder dairying is now recognized as one of the key tools for helping both Bangladesh and Mongolia achieve their World Food Summit (1996) and Millennium Development Goal (2000) targets of halving under-nutrition and poverty by the year 2015.
Dairy development for the resource-poor: Lessons for policy and planning strategies

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Acknowledgement: This paper presents an overview of findings from ILRI’s work on traditional dairy markets, work led by Dr. Steve Staal, Dr. Amos Omore and Dr. Bill Thorpe and supported by many other colleagues in ILRI’s smallholder dairy team. This work has also been carried out in close collaboration with national partners throughout Africa and Asia, and with international partners, including the Food and Agriculture Organisation.

Traditional dairy markets:

Traditional and informal dairy markets, although often ignored or unrecognised, represent a large proportion of domestic dairy trade globally, and are hugely important for resource-poor farmers, traders and consumers. Work by ILRI and its partners in Africa and Asia has led to a better understanding of the scale, characteristics and determinants of traditional dairy markets, and of their importance to the poor. The work has suggested a range of technical, regulatory and policy/institutional interventions in support of a more ‘pro-poor’ approach to dairy policy and development.

Key features of traditional dairy markets are that they are based on ‘traditional’ local products – usually liquid (raw or soured) milk sold directly to consumers in small quantities by small traders – rather than larger-scale processing and packaging of dairy products. The distinction between ‘traditional’ and ‘informal’ markets is blurred. Markets in ‘traditional’ dairy products are often legal, with licensed traders. However many are ‘informal’ – operating outside the industry’s regulatory structures on quality and safety – predominantly because of a mis-match between the demands of these regulatory structures and the low demand for food safety by consumers of traditional products.

Traditional dairy markets are very big, with market shares approaching 98% in countries such as Pakistan and Tanzania, 86% in Kenya and 76% in India. In the case of India, this traditional market share represents almost 70 million tonnes annually, compared with the total global dairy product trade of 80 million tonnes. Mainly in the form of ‘raw’ (unprocessed) milk, traditional dairy products reach consumers through a variety of routes involving direct sales or small-scale traders. These markets are strong not only because of the low cost to consumers (compared with formal processed products) but also because of consumer preference for traditional tastes, even amongst wealthier consumers. With price incentives for both farmers and consumers, and no evidence that ‘policing’ of informal traders significantly affects market share, this strong consumer demand ensures that traditional markets will not go away any time soon (although urbanisation is likely to reduce the traditional market role because of higher costs of mass supply).

Traditional dairy markets are also very important for employment. Work in Kenya, Bangladesh and Ghana has shown that the same volume of milk sold through traditional markets supports more than

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10 This paper draws on a range of work by ILRI and its partners, which are best summarised in a joint report with FAO’s Pro-Poor Livestock Policy Initiative “Dairy Development for the Resource-Poor – A Comparison of Dairy Policies in South Asia and East Africa” downloadable from: http://www.fao.org/ag/AGAinfo/programmes/en/pplpi/docarc/abst44.html
11 Based on 2004 figures from FAOSTATS.
five times the number of jobs compared with the formal sector, with most of these jobs paying more than the minimum wage\textsuperscript{12}.

Overall, it is clear that traditional markets provide apparently efficient market mechanisms for dairy development, especially in areas with poor infrastructure. The demand for ‘raw’ milk products means that they are unlikely to be substituted by processed products based on imported milk. The small-scale marketing complements the wider small-scale dairy production systems (labour-intensive farm household model with multiple outputs) with important implications for household nutrition and for environmental sustainability (based on internal nutrient recycling).

**Bridging the Gap: Integrating traditional dairy markets into formal dairy development**

As described above, traditional markets are often unregulated, as the low cost is based on low demand for food safety, compared with other needs, and consumers’ own assessments of milk quality. This compares with a high relative demand for food safety and consistent quality in the formal processed sector. Quality and safety issues are clearly extremely important in dairy development, so the challenge becomes clear: how can these hugely important traditional markets be encouraged to improve safety and quality, whilst maintaining their key characteristics – meeting consumer preference for traditional products at affordable prices, and supporting poor small-scale farmers and traders? Recent work, started in East Africa, but now extending to South Asia, is now indicating a series of steps that can help successfully to bridge this gap – i.e. to encourage traditional markets to improve quality and ‘formalize’. The desirable end result would be no more ‘formal’ and ‘informal’, but just ‘traditional’ and ‘modern’.

One key issue from ILRI’s work in Africa and Asia is that despite their large numbers and economic importance, stakeholders in small-scale milk production and traditional market agents are largely invisible in policy processes, with little voice in domestic and international policy. Another basic finding from work in East Africa was that licensing \textit{per se} did not currently ensure better quality milk. Not only was licensing often just an exercise in fee collection, but many measures that on the surface aimed to improve quality, could in practice have the opposite effect\textsuperscript{13}.

However, a series of interventions have been piloted which aim to address technical, regulatory and policy/institutional challenges to ‘formalisation’ of traditional dairy markets.

To address some of the technical challenges, a series of systems to support training in milk handling and testing have been developed, in close association with traders themselves. FAO and ILRI together with national and regional partners have developed training guidelines, published as guides for farmers and different cadres of traders, and also for trainers, and participatory training courses, based on these guidelines have been piloted. Subsequent research in Kenya has demonstrated a clear improvement in quality of milk sold by trained compared with untrained traders. Parallel to the development of training systems, ILRI worked with local traders in Kenya to develop appropriate, affordable milk containers, which both met the requirements of the regulators, and of the traders themselves (e.g. suitable for bicycle transport, with sealable lids).

To support the use of these technical interventions in transforming traditional markets towards ‘formality’, the training approaches have been combined with a process of certification by the


\textsuperscript{13} For example, the practice of confiscating milk-carrying containers from unlicensed traders would discourage such traders from using the more expensive but better quality metal containers.
regulatory bodies, so that trained traders are recognised by both consumers and regulators. A Business Development Services (BDS) model has been piloted in Kenya by the Kenya Dairy Board (KDB) in collaboration with an NGO, supported by ILRI. Training service providers provide milk handling and quality training to traders, who pay a fee to the service providers for this training. Having successfully completed the training, the traders can become licensed by the KDB, paying a cess fee\textsuperscript{14} based on the milk they sell. The training service providers are themselves accredited and monitored by the KDB, and in turn report back to the KDB on their courses and trainees.

Finally, evidence on the importance of traditional dairy markets for the poor has been used by a range of stakeholder groups in Kenya to lobby for policy change in support of small-scale dairy farmers and small traders. A new Dairy Policy now explicitly recognises the role of small-scale traders, supports training and incentives for safe milk handling, and establishment of a supportive certification system. The process of this policy change was not straightforward, and relied on long-term engagement in the policy process, presenting evidence based on empirical research and pilot approaches\textsuperscript{15}.

There have also been successful efforts to scale out these lessons from Kenya to the East Africa region and beyond. This has included dairy sector regulators from four countries agreeing on a series of harmonised training guidelines, and on the use of these guidelines in regulating and facilitating cross-border trade in traditional dairy products. The BDS model for linking certification with training on milk quality is also being developed in Uganda. In South Asia, the Dairy Department of the Government of Assam is now developing a strategy to certify and train local market agents, whilst in Andhra Pradesh, the Dairy Action Research project is also developing training of market agents.

The above examples show how changes in technical, institutional and policy have occurred in support of smallholder dairy farmers and traditional dairy markets. But do such changes actually have an impact on the livelihoods of resource-poor farmers and traders? A recent case study by ILRI has looked at the impact of the policy change in Kenya described above. The study concluded that there were real benefits, estimated at some $30 million nationally, with benefits spread between poor consumers and producers. These benefits were mainly due to a reduction of some 9% in margins in the traditional market, from reduced transactions costs and spoilage\textsuperscript{16}.

**An agenda for pro-poor dairy policy and development**

The evidence from the research on traditional dairy markets presented above strongly suggests that such markets will continue to play a large role for a long time, with benefits to the resource-poor, and that development of such markets can complement the formal processing market. The lessons from these analyses, and other research, present some elements of what can be termed an ‘Agenda for Pro-Poor Dairy Policy and Development’. The aims of such an agenda would include increasing the welfare of small farmers and market agents, meeting the needs of poor consumers, and sustaining the natural resource base. Specific objectives of such a ‘pro-poor’ approach, beyond traditional dairy development approaches, would include:

- Employment creation in rural and peri-urban areas and along market distribution and value chains.
- Reliable income generation and asset accumulation for resource-poor farmers.
- Provision of low-cost, safe dairy products to poor consumers.

\textsuperscript{14} This cess is a monthly tax on milk sold; all licensed traders and processors pay a small amount of money (approx 0.2KSh) to the Kenya Dairy Board for every litre of milk sold. This income is intended to be used to fund dairy development activities.


• Improved natural resource management and sustained farming systems through dairy cattle-mediated nutrient cycling.
• Improved child nutrition and cognitive development in resource poor households.

Thus, incorporating such an agenda in a dairy development strategy would involve:
1. Building on traditional dairy product consumption preferences at the same time as promoting demand for new products.
2. Supporting the development of traditional domestic markets for milk and dairy products, at the same time as promoting appropriate formal market development.
3. Emphasising and supporting the role of smallholder dairy production as a means of rural income generation and sustaining the intensification of mixed crop-livestock systems.

In terms of the relevance for a strategy for dairy development in Asia, emphasising the role of traditional markets is clearly most appropriate where such markets are strong – for example in South Asia, compared with South-East Asia. However, the general lessons are still the same – in any strategy for dairy development, it is important not to forget to target local markets, with products designed for local preference, and not to assume ‘western’ product choices.